UNIVERSITÀ DEGLI STUDI DI PADOVA

Department of Agronomy, Food, Natural Resources, Animals and Environment

Second Cycle Degree (MSc) in Italian Food and Wine

Investigating the role of "Italian Origin" claim and other key attributes in price determination: A hedonic pricing study in the olive oil markets of Italy and Sweden

Supervisor: Prof. Leonardo Cei

Submitted by: Pariya Mohammadi

Student n. 2041221

ACADEMIC YEAR   2023/2024

Abstract

With high competition and a saturated market in the food sector, particularly in Mediterranean foods, deep analysis and creativity in strategic decisions play a powerful and inevitable role. The determining characteristics of the olive oil market, or in other words, extrinsic values are the undertakers for the final price fluctuations which are exposed to consumer purchases. Geographical indication, organic labels or Italian claims perform crucial roles in the olive oil dynamic pricing and these players demonstrate different behavior in different countries of the European Union or even the regions in one country like Italy. Variation in the food industry increases consumer expectations around the world where most of the time, competition among producers takes place in the export destination. Italian growers who produce thousands of tons of Extra Virgin Olive Oil over the years, employ native values of Italian olives to provide the premium quality while they must monitor challenges such as disease, climate change or other incidents. Also, simultaneous export and import in this sector implies the relevance of olive oil trade flow and the strong impacts of that on the economic dimensions in southern European countries. Wine, citrus fruits and fresh vegetables, pork, cheese, and pasta are the other foodstuffs that improve the international market even in non-EU countries, using the hectares of profitable landscapes. Results show the importance of utilizing hedonic pricing where different values detect consumer preferences. Therefore, in this research, the prices of Extra Virgin Olive Oil in Italy and Sweden are analyzed to investigate difference.

Chapter 1. Introduction

Olive oil, a typically Mediterranean product, was used by different nations for different purposes. Ancient people used to cultivate olive variety for personal usage in their family as energy sources, fuel, pharmaceuticals, and as edible oil. So, they produced enough amounts to meet their personal needs. The current methods of olive oil preparation have been developed over the years by our ancestors, through testing many tools, initial instruments, and techniques. Over decades with the spread of olive cultivation especially in southern European countries in addition to the remarkable increase in demand for Extra Virgin Olive Oil (EVOO) modern methods with high efficiency have been created. (Kapellakis et al., 2008)

The expansion of olive oil, according to the first recorded agronomic writings, dates back to Roman times, when the Roman Empire acted as a connector, allowing olive plants to spread over Mediterranean regions. There have been many different cultivars in Mediterranean countries, which inherited special attributes in taste, colors and growing cycles which have been widespread across regions with special climate conditions (Vossen, 2007).

According to the (Olive Oil - European Commission, 2020) the different kinds of olive oil are categorized based on the method of preparation as:

- Extra-virgin olive oil that is obtained from fresh olive drupes, with high volatile composition that make the EVOO a premium quality. There are different determinant factors and methods to obtain the best quality like the degree of ripeness, malaxation and harvesting. From the nutritional point of view, the specific composition in EVOO claims the effect of strong medicines. Additionally, this oil is integrated highly by the healthy Mediterranean diet (L.Calamai, et al. 2012 & Watson, et al., editors. 2019).

- Virgin olive oil is a natural olive juice. Both EVOO and virgin olive oil are processed during pressing or centrifugation. This oil is obtained from fruit of the olive tree (Olea Europaea sativa), by mechanical or other physical methods.

- Lampante oil or lampante virgin olive oil which is a type of olive oil obtained by lower grade olives and it can be used for industrial purposes. Often the fruit in this

case is not edible. This oil needs more process to obtain higher quality as the high amount of free acidity or other organoleptic properties (Consonni & Cagliani, 2010).

- Refined olive oil, which is a virgin olive oil that is submitted to a refining process.
- Olive oil is composed of refined olive oil and virgin olive oils, that is the result of the blending of the two previous oils: virgin olive oils (not lampante oil) with refined olive oil. (EU Council Regulation (EC) No 1234/2007).[1]
- Olive pomace oil is a dense fluid that remains after the process of extraction. It could consist of skin, seed, stone and pulp or even olive kernel (Sánchez Moral & Ruiz Méndez, 2006)
- Crude olive-pomace oil that will be obtained after the production of the pomace, by using solvents or physical agents. (EU Council Regulation (EC) No 1234/2007).[2]
- Refined olive pomace oil: which is obtained from refining crude olive pomace oil. (EU Council Regulation (EC) No 1234/2007).[2]

In Italy, several varieties are used in obtaining olive oil and each of them carries the characteristic of specific geographical areas: the main ones are Taggiasca (Liguria), Frantoio and Leccino (Tuscany and Umbria), Coratina (Umbria and Puglia), Bosana (Sardegna), Canino (Lazio), Carolea (Calabria) Biancolilla, Nocelara de Belice, and Cerasuola (Sicily) (Vossen, 2007).

The growing of olive orchards has a great impact on the economy of each region. For instance, countries use the cultural point of view of olive oil as a method for promotion of tourism by protecting olive farm tourism, traditional olive and/or olive oil museums, olive oil delicatessens and gourmet shops and archaeological sites. (OLIVÆ Official, No 115/2011)

On the other hand, the significant role of olive oil in the Mediterranean diet coupled with numerous health benefits has led to the growing numbers of consumers globally. As a result of these important factors, olive oil has experienced progressive growth to remain in competitive strategies among the areas which are the most consuming and producing countries: Spain, Italy, Greece and Portugal (Carlucci et al., 2014).

---

[1] https://eur-lex.europa.eu/eli/reg/2007/1234/oj

The mentioned countries encompass the largest countries with the highest consumption of EVOO *"pro-capita"* (Lanfranchi et al., 2024).

1.1. Olive oil in Mediterranean countries

The Eu countries account for 53% of the world's total consumption of olive oil. (Olive Oil - European Commission, 2020.) Consumption of olive oil is considered as an integral feature of the Mediterranean diet and which is one of the biggest consumed and traded food production in the world. (Buckland & González, 2010)

Looking at the total olive oil consumption, data from the International Olive Council (IOC) shows that, in 2021, Spain, Italy, and France were the highest olive oil consumers among European countries. In terms of per capita consumption, Greece, Spain, and Italy show up as the leader countries. (IOC, 2023)[2]

When talking about the willingness of people to purchase olive oil which is considered as a traditional and popular production, it is important to study the role of culture in consumer behavior. Culture and food habits are important keys to evaluate the consumer preferences, since they shape customers' needs during the evaluation stage in the process of purchasing. As Solomon and colleagues (1999) indicate, "a consumer culture determines the priorities of certain products and the success or failure thereof."

In this respect, there are big differences in culture and amount of consumption across countries.

At consumption level, in the 2019-2020 crop year, Spain recorded 518 thousand tons of consumption while this volume is about 407 thousand tons for Italy in the same year. In 2022-2023 the consumption reached 359,000 tons for Spain, whereas Italy recorded 478,000 tons. This means a 30.7% decrease in consumption for Spain, while Italy experienced a 17.4% increase in consumption. (IOC, 2023)[3]

Overall, consumption is predicted to decrease among four major producers in 2024 due to the high prices caused by some issues in farming and extreme heat weather which will be discussed in next parts. According to the statistics from the Spanish olive market, this

---

[2] https://www.internationaloliveoil.org/what-we-do/economic-affairs-promotion-unit/#figures

country recorded 41 percent drop for extra virgin olive oil consumption, 14 percent for olive oil and 11 percent for virgin olive oil since 1930 (Simon Roots, 2024).

On the other hand, leading EU non-producing countries with high consumption are France, Germany, United Kingdom, Nederland, Switzerland and Sweden. The consumption volume is 8.8 thousand tons in Sweden which is the highest volume among other Scandinavian countries such as Denmark and Finland.

On the production side, the highest production was recorded in Italy until the end of 1980, and it was overtaken by Spain. (Buckland & González, 2010)

According to the Umbria Chamber of Commerce the production of olive oil in 19 different regions in Italy is defined as Figure 1. [3]

Also, the most important productive regions in Spain are: Andalucia, followed by Castilla La Mancha and Extremadura (Millán-Vazquez de la Torre et al., 2017).
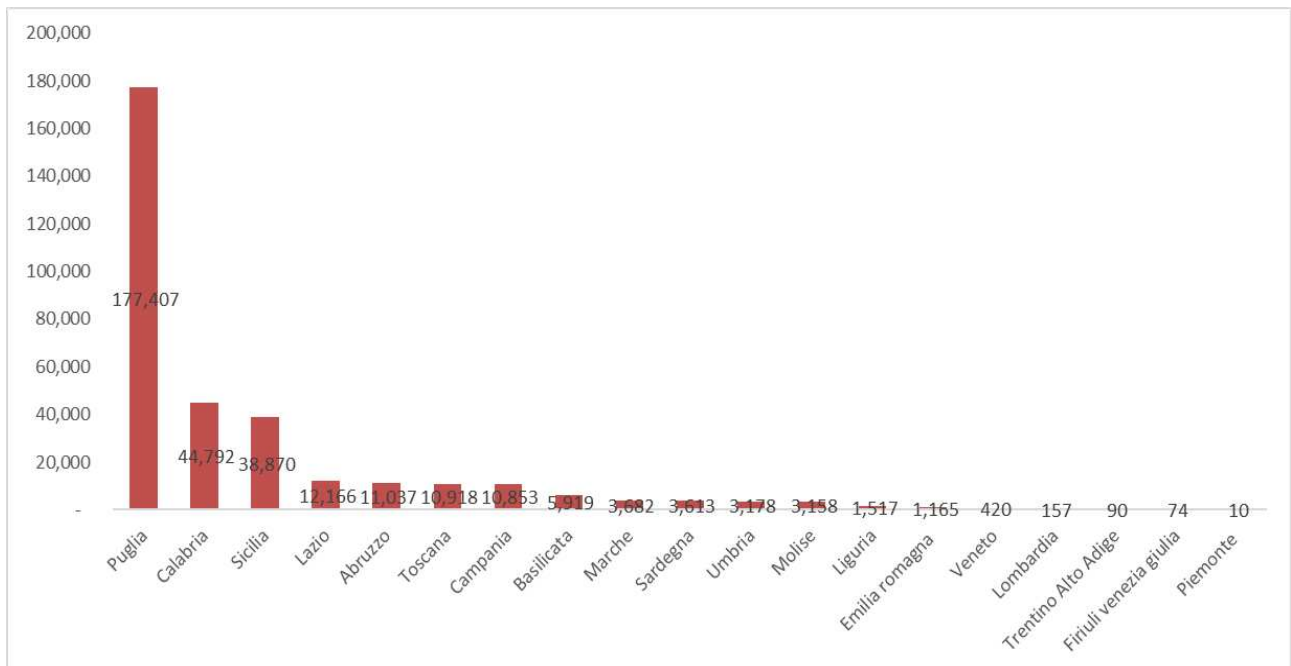
Fig 1. Production in Tons in different Regions in Italy - 2021
Chamber of Commerce of Umbria

However, the International (IOC), which is responsible for market-related activities, claimed a low-pace growth in EU production of olive oil in recent years in comparison with

---

[3] https://www.umbria.camcom.it/la-camera/comunicati-stampa/olio-doliva-landamento-della-produzione-in-tutte-le-regioni/documenti-allegati/tabella-1-produzione-olio-doliva-nelle-regioni-italiane.jpg

1990's. Also, recently, the production volume in countries which are new producing countries outside the Mediterranean regions Like Tunisia, Turkey, Morocco, Chile and Argentina is noteworthy (Mili et al, 2021). Referring to the data by IOC, production from these non-traditional suppliers increased by 8% annually between 2006–2007 and 2019–2020.

Nevertheless, (Mili et al, 2021) explains that the substantial increase in the production sector in non-traditional countries refers to the high focus on the abundant production of olive oil rather than the quality and sustainability, implemented by traditional countries.

Moreover, the production could be in different quantity year by year or region by region; for example, according to the announcement by the Umbria Chamber of Commerce, the decline in the production of olive oil is concentrated in south area of Italy, for instance, Calabria with -42%, Abruzzo with -40%, in 2021-2022. In central the production variation is positive like in Tuscany and Umbria around +27% and +25% in Marche. [4]

However, so many efforts in economic and technical fields have been done to improve the production concept and meet the high quality standards like the incorporation of technology and innovations to impulse internal or external investments or innovations in the milling industry (Mili et al, 2021).

And so on, this paper examines the olive oil market in Italy as a Mediterranean country and Sweden as a representative of Scandinavian countries to exert the values and measure the amount of the effects with a focus on pricing route. In the chapter 2, the statistics related to the import and export in EU countries specially the data regarding Italy and Sweden is analyzed. In addition, the most recent phenomena affecting significantly the price fluctuation is studied. Chapter 3 searches for the concept of quality that is presented to shed light on the market of olive oil. In addition, the main features that play a pivotal role in the consumers' choices are analyzed for better understanding of the leverages in the trading market of EVOO.

---

[4] https://www.umbria.camcom.it/la-camera/comunicati-stampa/olio-doliva-landamento-della-produzione-in-tutte-le-regioni

Chapter 2. Olive oil trading in EU countries

2.1. Export and import of extra virgin olive oil

Many studies were conducted in the field of EVOO to investigate the pattern of export and imports alongside high competitiveness. For instance, (Pehlivanoğlu et al., 2021) represent the idea of simultaneous increase of quality standards alongside competitiveness in the market. Therefore, to comply with quality standards, EVOO markets with high competition need implementation of policies and regulations to support the producers and growers. Likewise in non-EU exporters, the necessity of these policies exists, where, for example in Turkey the related rules regarding the international olive oil trade like the production, preparation, processing, labeling, preservation and transportation in standards hygiene condition is compulsory and necessary.

Considering Spain, Italy, Greece and Portugal as the main countries, according to Observatory of Economic Complexity (OEC), Spain has been the greatest exporter in the last decade. In the international trade context, olive oil trade mostly takes place between the Mediterranean countries, and is led by traditional main producers, mostly Spain and Italy (Mili et al. 2021). Spain and Italy are countries with the most trading between each other through marine and roadways, which have made Spain, the fastest growing market in 2020-2021, overtaking Italy (Galati et al., 2016).

Figure 2 displays the export quantities from Italy in 2022 with the primary destinations for extra virgin olive. The United States, Germany, and France are the top destinations. Referring to Eurostat "Over a third of EU olive oil exports went to the United States (203,000 tons, or 35% of extra-EU exports of oil olive)".
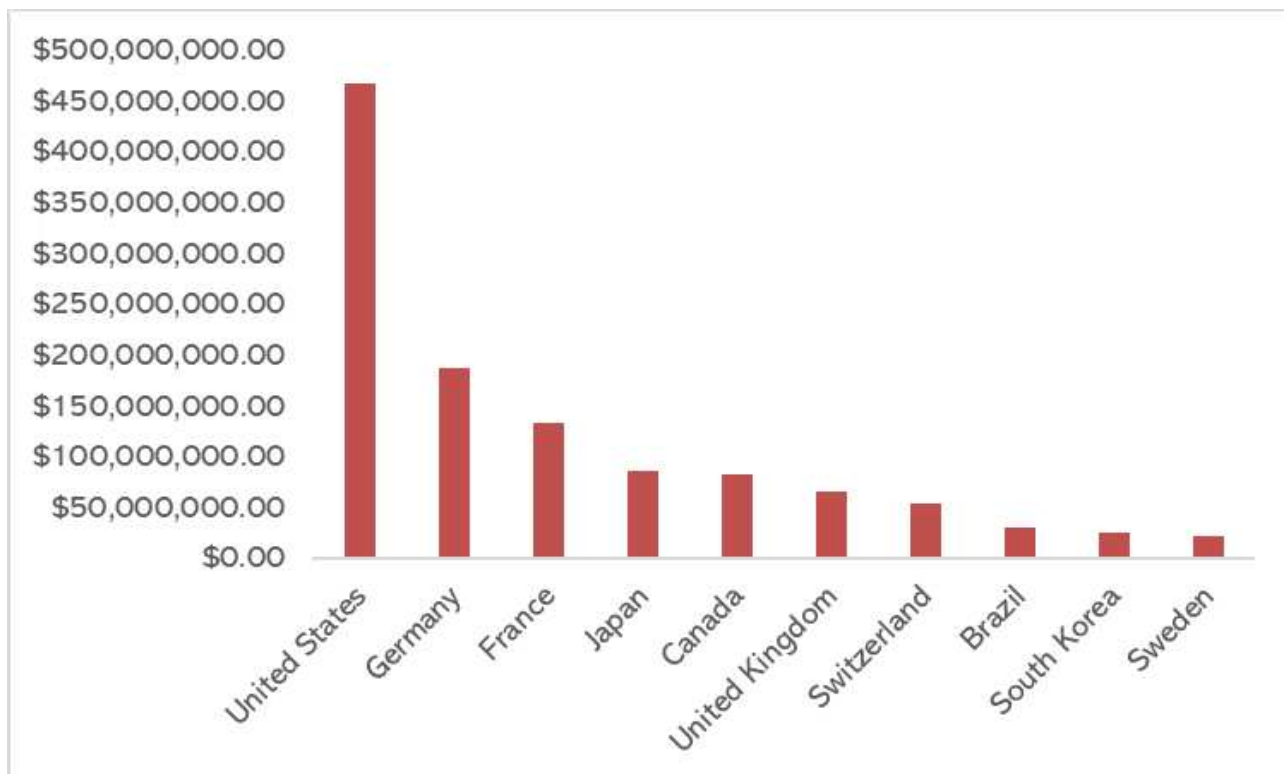
Fig 2. Destination of Export from Italy - 2022
(Olive Oil, Virgin in Italy | The Observatory of Economic Complexity)

The large amount of trade among mediterranean countries implies that the exporting and importing of traditional foodstuff in this area refers to many mutual attributes. For example, the existence of similar languages and currency or mutual traditions; Furthermore, the other attributes like development of tourism in southern European countries could promote this trade flow. In this way, countries with similar volume in demand and especially close per capita income build strong trade flows between each other (Kashiwagi et al., 2020).

Figure 3 demonstrates Italy imported olive oil in large volumes in 2022. Italy is one of the countries in which the capacity of the consumption exceeds the amount of production most of the time (Tempesta et al, 2019). It means sizable import volume beside the significant amount of exports from Italy.
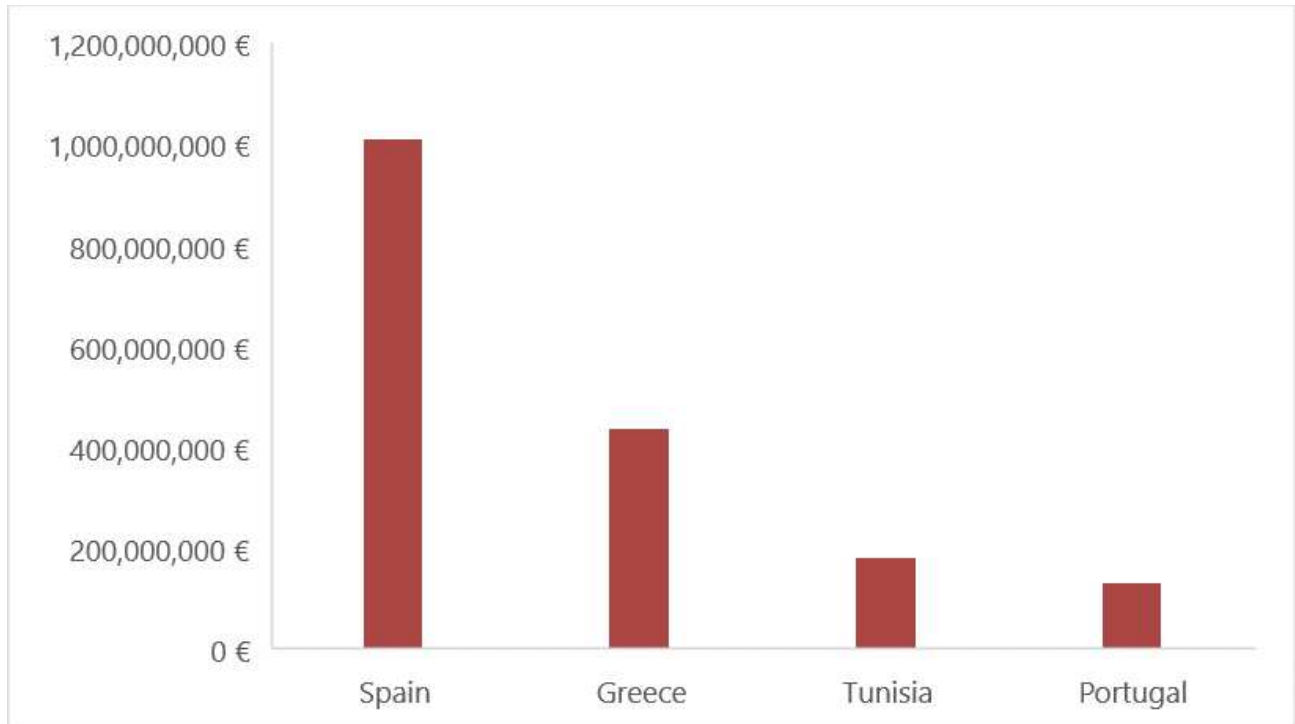
Fig 3. Origins of Import to Italy
(Olive Oil, Virgin in Italy | The Observatory of Economic Complexity)

A report published by Olive Oil Time in 2022 claims that Greek olive oil went to Italy in bulk in the year 2021, where Greece supplied more than 111,000 tons of olive oil for Italian consumption. (Costas Vasilopoulos, 2022)

In this particular context, the dynamic business characterized by concurrent import and export activities give the idea of intra-industry trade within the Mediterranean region. Homogeneous countries exhibit an outstanding presence in intra-industry trade patterns, with shared attributes playing a crucial role in facilitating such transactions (Kashiwagi et al., 2020).

In the case of olive oil, Italy benefits from this kind of trading, where Italy imports EVOO in large quantities of low or medium quality olive oil from Spain or non-EU producers. Production in these regions costs lower as result of cheaper labors or economies of scale. In this way, EVOO from Italy with premium quality and price competes with the low quality Spanish (or other non-EU producers) olive oil (Bimbo et al., 2020)

To analyze and investigate the role of Sweden in this survey, two graphs are provided regarding the import and export of olive oil in this country.
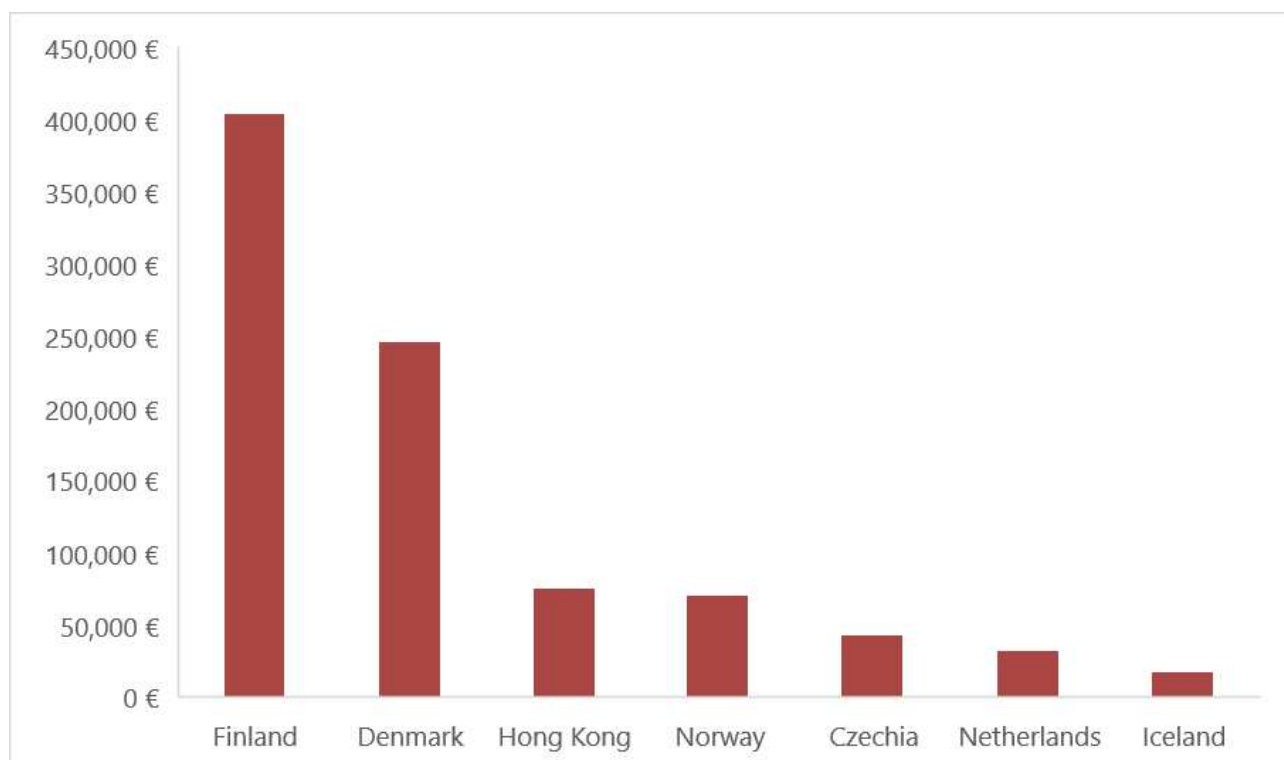
Fig 4. Destination of Export from Sweden - 2022
(Olive Oil, Virgin in Sweden | The Observatory of Economic Complexity)

The Figure 4 displays top countries which are the main destinations of export from Sweden. Interestingly, Sweden exported about 905.000 Euro in olive oil which is the 48th exporter in this field. The main destinations for exporting in 2022 includes: Finland, Denmark and Hong Kong. This kind of export strategy is known as "re-export". It means the entrance of a good into a country in which there is local consignee and exporting again the good to another destination. Companies can gain efficiency in speed and cost through re-exporting. (Müller, 2003)
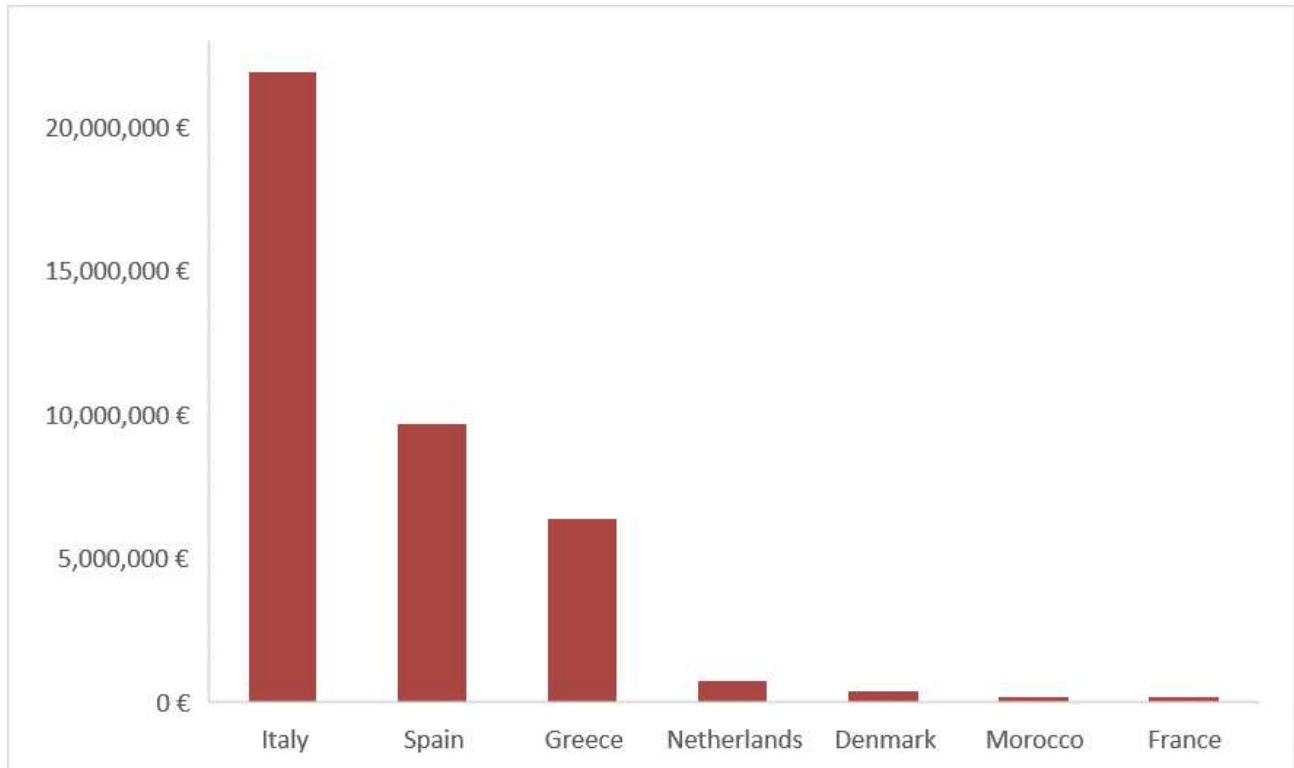
Fig 5. Origins of Import to Sweden - 2020
(Olive Oil, Virgin in Sweden| The Observatory of Economic Complexity)

The provided graph offers the volume of import and the respective origins of imports to Sweden. In the year 2022, Sweden imported $43.7M in virgin olive oil, becoming the 25th importer in the world in this field.

Italy is the main importer to Sweden, which is known as one of the high quality olive oil importers, supplying more than half of the olive oil consumption (54%). After Italy, Spain with 24% and Greece with 15.8% are the main exporters. The imported amount of olive oil in Sweden is as below based on the oil categories:

Extra virgin olive oil 84%, blended and refined oil with 10% and virgin or other types of oils 6% (CBI Market Potential, 2024).

Subsequently, in this framework the fact that olive oil is one of the most popular edible oils which is more expensive than other oils has led to numerous examinations in the price formation process. In the Italian olive oil market, the pricing strategies depend widely on the different attributes of EVOO and these strategies are implemented based on the preferences of consumers. For example, the importance of different certifications like

geographical indications (GIs), organic and country of origin has created changes in dynamic pricing (Román et al., 2014).

In Table 1, the instability of prices in this segment is provided. The statistics are dedicated to production and import for Bari in Italy which explains the fluctuation between the years 2011-2020. Extra virgin olive oil cost 578 euro per 1000 tons in 2016-2017 which is the highest in the mentioned period. The highest amount of production is defined for the years 2015-2016 in this region.

Production and Prices in Bari			
	Year	**Production** **(1000t)**	**Price/Kg** **(Euro)**
Lowest Price	2011-2012	400	254
Highest Price	2016-2017	182	578
Lowest Production	2018-2019	475	563
Highest Production	2015-2016	475	368
Import and Prices in Bari			
	Year	**Import** **(1000t)**	**Price/Kg** **(Euro)**
Lowest Price	2011-2012	14	254
Highest Price	2016-2017	41	568
Lowest import	2011-2012	14	254
Highest import	2019-2020	152	345

Table 1. Production and Prices in Bari & Import and Prices in Bari
OLIVE OIL PRICES - July 2023

Based on the olive oil prices identified by the IOC (November 2022 update) [5] in Bari, one of the main markets for olive oil, extra virgin olive oil costs, at the farm gate, less than €329.2 per 100 kg for 25% of the time, and 25% of the time it exceeded €508 per 100 kg. The average price is about 421.4 per 100 kg.

---

[5] https://www.internationaloliveoil.org/wp-content/uploads/2023/07/IOC-prices-rev-0-1.html

Prices and Consumption in Bari			
	Year	**Consumption** (1000t)	**Price/Kg** (Euro)
Lowest Price	2011-2012	610	254
Highest Price	2016-2017	439	568
Lowest Consumption	2019-2020	404	345
Highest Consumption	2013-2014	641	332

Table 2. Prices and Consumption in Bari
OLIVE OIL PRICES - July 2023

Table 2 illustrates the relationship between the prices per 100 kg and the amount of consumption according to 1000 tons between 2011 to 2020. The lowest amount of consumption is shown for 2019-2020.

As is observable in the provided tables from the Bari olive oil market, a wide range of prices have been performed during the last decades. This reveals the presence of the predictable or unpredictable drivers of prices. Many recent studies, for example, highlighted climate change threatening the situation of olive farms in all southern countries of Europe. Which are suffering from heavy rains, prolonged droughts, floods or early ripening of the fruits. Hence, in the late 21st century global climatic shifts cause a significant uncertainty within the economic sphere concerning agricultural crops (Orlandi et al., 2020).

According to the Italian growers, the prediction of solutions to deal with the consequences of temperature and weather extremes nowadays are a major part of supply chain competition. Currently, climate disasters are defined as a key factor causing the increase of prices through the main producing countries, deriving from a production decline (e.g., the production dropped by 55 percent in the 2021-2022 crop year in Spain).

Therefore, the knowledge, education and role of the farmers in making strategic decisions with accurate timing to obtain high quality olive oils, seem challenging (Ylenia Granitto, 2023; Nedjeljko Jusup, 2023).

Recently, one of the other main phenomena which affected the pricing sector in the food industry, especially for food production with high potential of export, was Covid-19. Supply and demand, changes in consumer preferences during quarantine or the provision of

regular logistical support were some of the main problems during the pandemic. Despite the complicated conditions in the olive oil trading sector, the volume increased by 17% in 2020 in Italian olive oil export. However, the performance of the traditional products of Italian origin are different, for instance the wine sector incurred in a 37% decline which could be a consequence of the lockdown, especially regarding restaurants or bars (Coluccia et al., 2021).

Finally, it would be helpful at this point to address some problems that appear in the research around olive oil marketing like the absence of an official or global benchmark. For instance, just three main centers including Bari (Italy), Chania (Greece), and Jaén (Spain) are the representative markets, meanwhile it is crucial to access data regarding trades in small scale producers or non-EU producers to control the market properly.

Chapter 3. Claims and Other Extrinsic Values

In the context of the food market, the product attributes can be divided into 2 categories: intrinsic and extrinsic characteristics

Intrinsic values which are integrated with the products and obtained in the process of production, like color, texture, odor and clarity which significantly impacts on the organoleptic characteristics. Intrinsic category is the one which is not departed from the product.

The other values are extrinsic characteristics like country of origin, certifications, discounts, brands and prices which are not physically or initially a part of the product. This post-production factor is dedicated to the values which could be modified after the process of production. Consequently, it will influence the consumers opinion and decisions (Espejel et al., 2007).

The information provided by extrinsic and intrinsic attributes, form a value judgment for defining the quality perception. In this way, clients who face a large number of choices, like different brands, GIs, organic or conventional goods, various sizes, the method of packaging as glass or tin cans, discounts, private brands or farm labels, could observe

the quality perception through extrinsic and intrinsic features (Santucci et al., 2021; Tempesta & Vecchiato, 2019).

Other studies introduce 3 kinds of attributes when analyzing the quality. Search, experience, and credence attributes are 3 different classifications which help to respond effectively to the consumer's demand.

The search attributes are the ones which is comprehensible, and it is known as the high degree of certainty as it seems accessible for consumers at the time of shopping.

The second category is experience quality attributes which are perceivable by consumers just after the utilization of products or services. In the food section, this stage seems crucial as it has an effect on the organoleptic characteristics and also could be determinant for next purchasing decisions.

Credence quality attributes are characteristics that are not understandable at the time of purchase or during consumption, such as contaminations, hormones, bacterias or antibiotics. Therefore, the information is not available, and it is not possible for customers to estimate these values. This stage is known as the lowest certainty level (Becker, 2000; Girard & Dion, 2010).

However, each feature acts differently on the consumer preferences in every market; hence, many studies have been conducted to discover the purchase motivators among clients. Familiar brands, sensitivity to geographical territories, and on the other hand advantages in diet or nutritional information are some motivators for purchasing decisions. As an example, (Jada et al., 2023) explain that "provision of nutrition information" motivates people to perform a healthier choice and moreover urban customers are more willing in the nutritional information in comparison with rural or local people. Regarding the differences in the responses of urban and rural consumers to originality of goods and services, the buyers who are local or more familiar with the products and the originality of it, make a better evaluation than the urban buyers. In another research about consumer behavior, the methods of production play a crucial role, where people show positive response to organic production, especially after the pandemic, following this trend to purchase foods with less environmental impacts and higher quality.

In addition, buyers in developing countries consider foreign products as an index for superior quality and higher price, where local producers are considered to manufacture lower quality goods, while they export the goods with high quality (Hussain, 2016).

Other stimuli are different prices of the same products, the tendency of consumers toward glass bottles instead of plastic material or different sizes of portions. Also, other investigations suggest that, in some countries, the status of imported goods acts as an index for high quality (Delgado & Guinard, 2011; Lanfranchi et al., 2024).

To find and work efficiently based on the definition of "quality", it is needed to interpret the best explanation for this universal word as food industries employ diverse methods to gauge consumer-demanded quality (Espejel et al., 2007; Pagliuca & Scarpato, 2011).

As a sample for quality interpretation (Kramer & Twigg, 1970), quality is "the composite of those characteristics that differentiate individual units of a product and have significance in determining the degree of acceptability of that unit by the buyer". In this respect, market strategies move towards finding the best routes to the perception of consumers' demands. The recognition of these factors can build an effective relationship between food services and consumer attitudes. Also, when talking about the implementation of quality, it is important to consider companies as food services providers. Moreover, quality and safety regulation must be applied in every stage of the production process like the application of technological, logistical and economical features in an integrated way. Also, the existence of related standards and regulation are crucial on an international level where for example, to obtain the quality standards, traditional production requires developing quality controls to guarantee expected requirements (Trienekens & Zuurbier, 2008).

Moreover, regarding the meaning of quality (Pagliuca & Scarpato, 2011) suggests two different categories as subjective and objective quality. Objective quality pertains to the tangible attributes provided in a food product, typically determined by professionals and technologists in the food sector, while subjective quality refers to how consumers observe and explain this definition. The first classification refers to the type of quality that is assessable with a strong relationship with "food security". The objective quality associated with standards parameters which is highly required in the industry. Subjective quality includes two dimensions: the holistic approach and the excellence approach. The first

perspective indicates having all the desirable properties a product is perceived to have; the second one means "desirable properties that consumers, in their own language, may not view as part of quality."

3.1. Geographical Indications

According to Article 22.1 of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement, GI labels are defined as products "where a given quality, reputation or other characteristic of the good is essentially attributable to its geographical origin." (TRIPS: Agreement on Trade-Related Aspects of Intellectual Property Rights, 1994).[6]

The European Commission defined the way in which GI is implemented as "product names can be granted a 'geographical indication' (GI) if they have a specific link to the place where they are made. The GI recognition enables consumers to trust and distinguish quality products while also helping producers to market their products better."

The European legislative framework is designed in an appropriate manner based on the multiple regulations which protect and ensure geographical origin. Additionally, countries manage their individual traditional systems to guarantee the quality of the products that leads to a framework of high-quality food production which is integrated by the origin.

The relevant legislation to consider is Regulation (EU) No 1151/2012 of the European Parliament and on the quality schemes for agricultural products and foodstuffs.[7] This regulation defines standards concerning labeling and marketing, ensuring the compliance of appropriate data on quality and origin.

The European GI system contains two distinct categories: PDO or protected designation of origin, for products that are exclusively produced in a specific geographical area, and PGI or protected geographical indication that is less stringent in that it allows for ingredients resources to come from outside of the designated area.

---

[6] https://www.wto.org/english/docs_e/legal_e/27-trips_01_e.htm
[7] https://eur-lex.europa.eu/eli/reg/2012/1151/oj

Fig 6. PDO and PGI symbols (in respective order) used to represent products Geographical Origin

Specifically, regarding the standard of GI in the olive oil market "A regional designation of origin may be covered by a protected designation of origin (PDO) or a protected geographical indication (PGI) under Council Regulation (EEC) No 2081/92 of 14 July 1992 on the protection of geographical indications[8] and designations of origin for agricultural products and foodstuffs. (amended by Commission Regulation (EC) No 2796/2000).[9]

Furthermore, Commission Regulation (EC) No 1019/2002, indicated "Designations indicating a regional origin should be reserved for PDOs or PGIs so as to avoid confusion among consumers potentially leading to market disturbances." [10]

Recently regulation 2022/2104 has been published with the aim of more support for a fair trade market and competition in the olive oil sector, mentioning quality criteria, traceability and labeling standards.

Before the formation of policies regarding the protection and supporting of agri-food products, the sign of guilds on the local food, demonstrated a premium quality in the Middle Ages. Afterward, with the growing market of foods, besides the increasing consumer demand with different expectations from the market, the importance of symbols to signify the quality perception increased. So, international agreements like GIs are

---

[8] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31992R2081
[9] https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32000R2796
[10] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:155:0027:0031:en:PDF

implemented, which is originated by the definition of terroir that represents the contribution of culture, history, traditions and environmental factors of an indicated region. One of the main purposes of GIs is the protection of the reputation of well-known food products (e.g., Chianti from Italy or Bordeaux or Champagne from France) and prevent misinformation or fraud, or the knowledge of production. Consequently, GIs act as players which ensure the consumers decide to purchase a high quality product. Generally, these labels that provide information about origins, consider linking the consumers demands and quality perception (Aprile et al., 2012; Bonanno et al., 2020).

According to the premium attributes regarding PDO and PGI, most of the time these labels carry higher prices in the market in comparison with standard products. As an example, consumers value the unique quality of high reputed food stuffs like Champagne or Parmigiano Reggiano cheese (Bonanno et al.,2020).

However, the different willingness to pay (WTP) is considerable, especially for the consumers with less awareness of traditional food products or lower incomes as well as the impacts of some intrinsic values in the process of purchasing. In an investigation by the University of York and the University of Naples, which analyze and contrast the preferences of purchasing olive oil, the WTP for olive oils from 3 different regions South, North and Center of Italy are different. Oils from the South of Italy (like PDO Terra di Bari or PGI di Calabria) are more attractive for the consumer who lives in the South like Naples rather than people in the North like Milan, with Rome in the center where the appeal is intermediate. The observation supports the evidence of home-biased (Scarpa & Gludice, 2004).

From the producers' standpoint, PDO-PGI labeled olive oil could improve benefits, contingent upon the reputation and scale of the GI as well as the age of the GI group (Bimbo et al., 2023). This attribute allows producers to build signals for high quality and price premium. In this way, both consumers and producers find a great mutual tool to address their satisfactions. Although the premium prices seem profitable for the producers, the compliance of standards and education expenses are significant, particularly in developing countries. Overall, the necessity of supporting the farmers and local producers is inevitable, especially in rural areas who are the main growers of GI-labeled foodstuff (Bimbo et al., 2023). As the consequences of high demands regarding

GI-labeled foodstuffs the increase in the volume of production is predictable. The premium prices, potential market and thanks to the regulations to protect agri-food sector, the producers get motivated about higher amount of production in comparison with standard production (Cei et al., 2018).

Furthermore, GI is defined as a socio-economic tool which improves the idea of globalization of society, especially local areas. Therefore, GI is a supportive value which goes align with the protective role for history, growers, and local societies. GI ensures the uniqueness of a product and defends competitive consequences of the market and it showcases a remarkable presence in the economic development for rural communities, where agritourism or culinary festivals could be set up.

Finally, all the values regarding the origins and areas could be considered to make the consumer clear in the process of purchasing. Because of that this place-based feature attracts extensive attention among policymakers and trade representatives (Bonanno et al., 2020.; Cei et al., 2018)

3.2. Organic

According to the Regulation (EU) NO 2018/848 on organic production and labeling[11], organic production is an overall system of farm management and food production that combines best environmental and climate action practices with high level of biodiversity, the preservation of natural resources and the application of high animal welfare standards in addition to high production standards, in line with the demand of a growing number of consumers for natural substances and processes.

The definition of "organic" is being examined as an extrinsic feature and a deep study is needed to understand the advantages. So many policies and regulations are indicated to govern the organic farms and facilities, which mention the rules regarding soil management, animal well-fare, pest and disease control, use of fertilizers, and restrictions on the use of synthetic chemicals. (European Commission, Organic Sector, 2018)[12]

---

[11] https://eur-lex.europa.eu/eli/reg/2018/848/oj
[12] https://agriculture.ec.europa.eu/farming/organic-farming/organic-production-and-products_

Organic farmlands in European countries consist of 18.5 million hectares. The largest organic farm area is in France with 2.9 m/ha, followed by Spain and Italy with 2.7 and 2.3 m/ha (in 2021). In comparison with 2021, Italy and Greece are the countries with the largest increase in the hectare of organic farms in 2022 (Willer et al., 2024).

The leaders of organic olive farms in Europe are shown in Figure 7. Following this trend, in Mediterranean countries where olive cultivation plays a crucial role, the enterprises are eager to convert traditional fields to environmentally friendly systems (Sgroi et al., 2015). The facilities and possibilities in the field of organic farming apply differently. The subsidies given by the European Commission to millers and growers to improve and upgrade the mills systems or precise irrigation systems, will promote the soil sustainability and the efficiency of the landscapes in the long term. In Italy according to the Ministry of Agriculture, Food and Forestry, millers that are financed by the new subsidies "should reduce energy consumption and lower their environmental impact." (Paolo De Andreis, 2022)

As examples, (Santucci et al., 2021) Sardinia and Puglia in the south of Italy, are the regions that are imparted from the subsidies provided from regional implementation on their olive farms and mills due to the EU Reg. 2078/92.[13]

---

[13] https://eur-lex.europa.eu/eli/reg/1992/2078/oj
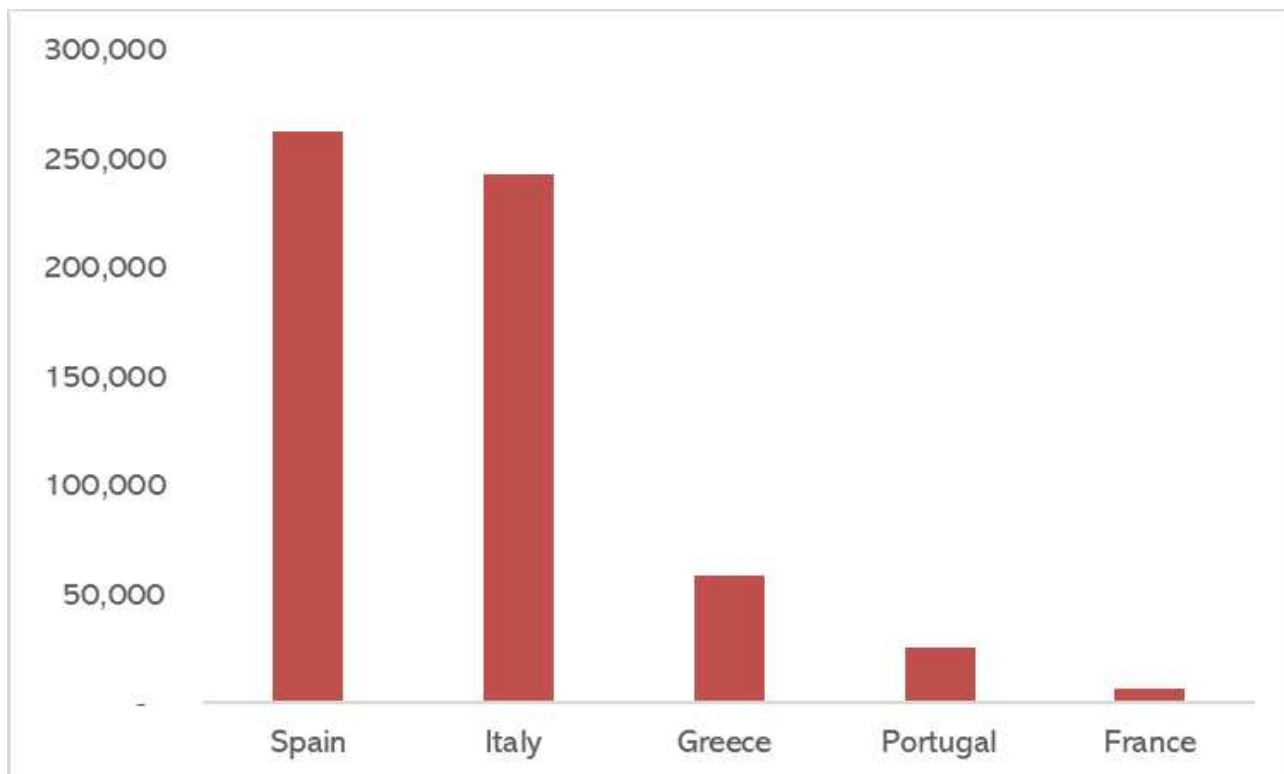
Fig 7. The countries with largest organic olive farms in hectares in 2020
FiBL. (2024). *European Union Country Data: Land Use and Crops*

From a consumer perspective, Italy recorded 60 euro per capita in consumption of organic food products in 2019. Also, the countries with the highest per capita consumption of organic food products were Denmark, Austria, and Switzerland (Willer, 2021).

Several studies have examined customers' willingness to buy organic products, often seen as healthier, more nutritious, and more ecologically responsible. The future of organically produced foods largely depends on consumers' WTP for these green labels, where the educational attainment are significant determinants of WTP (Lanfranchi et al., 2024).

Due to the growing trend of organic methods, it is important to understand which factors are important for consumers to purchase organic goods. Based on the investigations in Swedish organic markets, consumer motivations for purchasing organic food products include several key factors, for instance, environmental and climate issues, healthiness, biodiversity, animal wellbeing, and taste preferences(Vos, 2022)

From the economic perspective, the discussion about prices and profitability of organic systems in comparison with traditional ones from the producer's standpoint is necessary. According to (Sgroi et al., 2015) the benefits from organic farming lands is 21.1% higher than conventional ones which means compensating the low yields of organic fields. In another case, research conducted in Greece showed the profitability of both methods; however, there is a notable increase in profitability for the organic category especially according to the extra-governmental subsidies which are dedicated to organic olive farming to enhance the viability of organic productions

(PANAGODIMOU et al., 2019). Furthermore, agritourism on local systems which perform within organic systems is profitable for farmers through the sale of organic products (Santucci, 2002).

According to (Santucci et al., 2021) prices of organic EVOO seem to be lower in southern Italy (with larger quantities of production) in comparison to northern and central regions. For instance, in Sicily organic EVOO priced at 6.3 euros per liter and conventional EVOO at 6 euros per liter at the farm gate in 2019.

(Sgroi et al., 2015) discusses the cost which organic producers will face in contrast with conventional producers; obtaining organic production with special rules and definition from Farm to Fork means higher costs, even in the sectors like education and certifications. Labor, utilizing materials like seeds, fertilizers and fuels are the factors affecting the production cost in comparison to the conventional olive oil process. The factors which cause higher costs in both conventional and organic farms are the costs for chemical substances in conventional systems versus fuels, educated labors and repairs expenses.

3.3. Italian origin (100% Italian)

According to the European Commission Regulation NO 2454/93 in 1993, regarding the implementation of the Community Customs Code, the Origin of the goods is divided into two types.[14]

Non-preferential origins that refer to the origin of the country where they were worked or processed. It means that Country of Origin is implemented on the goods whose "production involves two or more countries originating in the country where the last substantial processing or working took place."

And preferential origin, that granted by the EU, outlines that a "product must be wholly obtained in the beneficiary country, or result from sufficient processing of goods imported from a third country."

Country of origin may impact the reputation of the production negatively or positively. Market strategies need to investigate the role of country of origin on the consumer's perception. This is the priority of the companies to manage the claim of the country of origin to benefit from it. The effect of country of origin seems to act in a complex way in the consumer's brain, for example they consider the "made in France" products to be more stylish, or the high tech devices manufactured by the US, or the powerful Japanese automobiles and electronics market.

 The use of the label information specially in the case of Made in Italy seems pivotal. The obligation to indicate the origin of olive oil, as required by Reg. (CE) N. 182/2009 [15] has been important to avoid any fraud or misusing of 100% Italian EVOO (Pagliuca & Scarpato, 2011)

(Verlegh & Steenkamp, 1999), suggests ways in which the indication of the country of origin affects consumers' decision.

First, a cognitive definition of origin, which is a method of judgment for high or low quality, when clients seek predictable attributes like clarity, color and taste as cues which are observable. The cognitive aspect of the country of origin creates an image of the country,

---

[14] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31993R2454
[15] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:063:0006:0008:en

like when the consumers consider high tech goods production as requiring educated or professional laborers who are concentrated in developed countries.

The second way is based on affective aspects, when the indication of origin leads to the imagination of memories, national or ethnic identities. This perspective deals with symbolic and emotional issues, like when consumers are aware of the high quality of the goods made from a special country, but they reject purchasing those products because of the strong negative attitude of that special country.

Finally, the last one is the normative dimension, where social and personal norms are involved in daily purchasing. This idea will improve and promote the domestic supply chains where campaigns are held for example in the US or Canada to motivate clients to buy local and domestic goods. In this framework the purchasing patterns are also integrated with prohibition of some countries which are known as involved in questionable activities like when Jewish consumers restricted the purchasing of German products because of the holocaust, or when some Chinese consumers consider the purchasing of Japanese goods as a treason because of the economic and military issues between the countries.

The impact of indication of origin in the food and beverage industry is interesting, especially when the Italian origin is at stake. There are so many signals on bottles and packages that enable consumers to perceive the Italian origin of products in the process of purchasing. Therefore, these signals act as guidance which consequently affect the consumer behavior. For instance, the colors of the Italian flag with "100% Italian", illustrating the special shape of the country, utilizing the famous monument's map or the sounds of Italian words (Bonaiuto et al., 2021).

The spectrum of origin indications is not restricted to countries. The origin of products in cities and local areas is an extrinsic factor that is frequently used as well. Therefore, the concept of origin as a determinant factor expands and integrates with the small-scale spatial. For instance, considering pizza or the famous perfumes in Venice as a "city" creates a positive image for tourists and visitors, thus, these stimuli act as leverages for marketers (Mandal, 2020).

In general, the indication of origin creates a framework of synthesis in the purchasing pattern. Claims about origin affect consumers' decision process by evoking concepts like

"safety", "Nostalgia" or "authenticity" because of the integration of the values with that place (Marcoz et al., 2016) .

This trademark would appear on the packages as an adhesive label or for example on the window of Italian shops. Another noteworthy application of 100% Italian is the ability to trace and check the true origin of the production. (madeinitalycert.it)[16]

Regarding the preferences of the consumers who are analyzed by their choices by (Thiene et al., 2013; Verdonk et al., 2017)WTP for Prosecco as a traditional sparkling wine and of Champagne from France is highly dependent on the brand image or country reputation.

---

[16] https://madeinitalycert.it/

Chapter 4. Aims

This master thesis explores how the price of Extra Virgin Olive Oil varies according to different attributes, such as GI, Organic labels, country of origin, Italian claim, retail channel. The mentioned extrinsic values are usually perceived as strong drivers of the price in the food market, in particular, in the EVOO market which is one of the biggest traditional food markets in Mediterranean countries. In this thesis, we discuss the price differences observed in the Italian Swedish market.

The aim of this market research is to provide a perspective about how certain characteristics of EVOO affect its price. Having this kind of information can be a useful driver for producers and local growers to benefit from the use of these factors. The importance of some features grew in the last years, such as for organic labels, GIs, local food or country of origin. Here, we investigate the role of these factors in Italy, a traditional EVOO exporter, and in Sweden, one of the major importers of Italian food.

Chapter 5. Materials and Method

During this research the price of olive oil is analyzed according to the hedonic pricing model; the price as a dependent characteristic is evaluated by different types of attitudes. The main idea of this model, known also as hedonic regression, is based on making any correlation between the dependent variable and other traits which act independently, and also between the independent values .(Montero & Fernández-Avilés)

This model of pricing developed primarily by the theory of real estate economics and non-market valuation of environmental amenities. This method is popular in the food and agricultural section as it could estimate the implicit value of product attributes. For instance, there are studies providing estimation for product price in the market of olive oil according to their attributes like oil extraction method, localization of selling firms, cultivar composition or packaging. From the consumer standpoint, the hedonic price analysis of EVOO in the case of food credence attributes like organic labels, environmental-friendly productions, 100% Italian, and food safety which cannot be evaluated simply by buyers, hedonic pricing will be a useful tool to predict the final price (Cavallo et al., 2018).

 The independent factors in this dataset contain 8 different variables, between 114 productions of extra virgin olive oil which are available in the market of Italy and Sweden. These 114 observations were collected in April of 2023 from super-markets which are known at the international level. The estimation and studies on the price are based on the 1 liter of EVOO. The information on the labels provided by the author are the ones available in the supermarkets including Aldi, Ali, Despar, Conad, Pam and Coop in Italy. The biggest volume of data is available in Coop. The Swedish markets contributed to this field are: Coop, Willys, Ica, Hemkop and Lidl. The largest number of items are related to Coop stores. As Sweden is not a country with significant olive production, obviously the number of data collected is considerably less in comparison to Italy.

In this context, each observation which is mentioned in this study, available in the supermarkets could be considered as a hedonic pricing function. This function works when the variables are defined as inputs and convert the market transaction prices to the outputs. The most currently hedonic pricing equation is based on the Ordinary Least

Square. The true form of the equation to study the price as the dependent variable is as below:

$$y_i = \beta_0 + \beta_1 x_{i1} + \cdots + \beta_p x_{ip} + \varepsilon_i$$

In this model y_i is the dependent variable which here we defined it as price, dedicated to i_{th} observation and could be impressed by independent factors negatively or positively. β_0 is the constant term in this linear regression and signifies the value of y_i where all the other independent features are assumed to be zero. β_1 could be defined as the related coefficient which can display the expected changes in y_i for a one-unit. β_p is the coefficient or in another word the effect of the p_{th} variable whereas all other factors are held constant and €$_i$ is the model's error term, which could be as a result of randomness which is not included in the model.

In this framework the dependent variable (y_i) is the price of EVOO based on Euro for both Italian and Swedish markets. The independent factors (β_1) are the ones which impact the price negatively or positively which are observable on the labels or on the pricing tags. The analyzed information engraved on the labels contains GI which includes which is studied as PDO and PGI, organic, Italian claim or 100% Italian, sizing of the bottles, country of origin. In addition, discounts, country of selling and supermarkets are the other features in the analyzed model. Additionally, in this context the correlation along the independent variables are disputable. This could be concluded that the predicted variables are the leaders which caused fluctuations in the present market trade research.

Chapter 6. Results

6.1. Summary statistics

In this framework it is necessary to examine the information in statistical context to understand the effect of independent variables on prices based on different parameters. Thus, the mean, median and standard deviation of the prices of the sampled olive oils are reported in table 3 to better understand their distribution. The median is a measure of the central tendency of a distribution, since it is the middle value of the dataset. Its value in our sample is 12.83 €/liter. The mean of prices including all the items in the Italian and Swedish market is about 14.19 €/liter. Standard deviation (SD) quantifies the diffusion of the data points around the mean. The SD is equal to 5.62 €/liter which suggests some degree of variability of prices, as can be seen also from the maximum and minimum prices.

	Median	Mean	Max	Min	St.dev
price/liter	12.83	14.19	31.80	4.49	5.62

Table 3. Summary Statistics of Actual Prices

Fig.8 illustrates the price range based on their frequencies regarding actual prices that present a vision of how frequently the prices are and their distribution. As it has been demonstrated the concentration of the dataset is around the prices of 10 to 14 Euro per one liter. The most frequent prices are located in the middle, and this makes a bell-shaped curve.
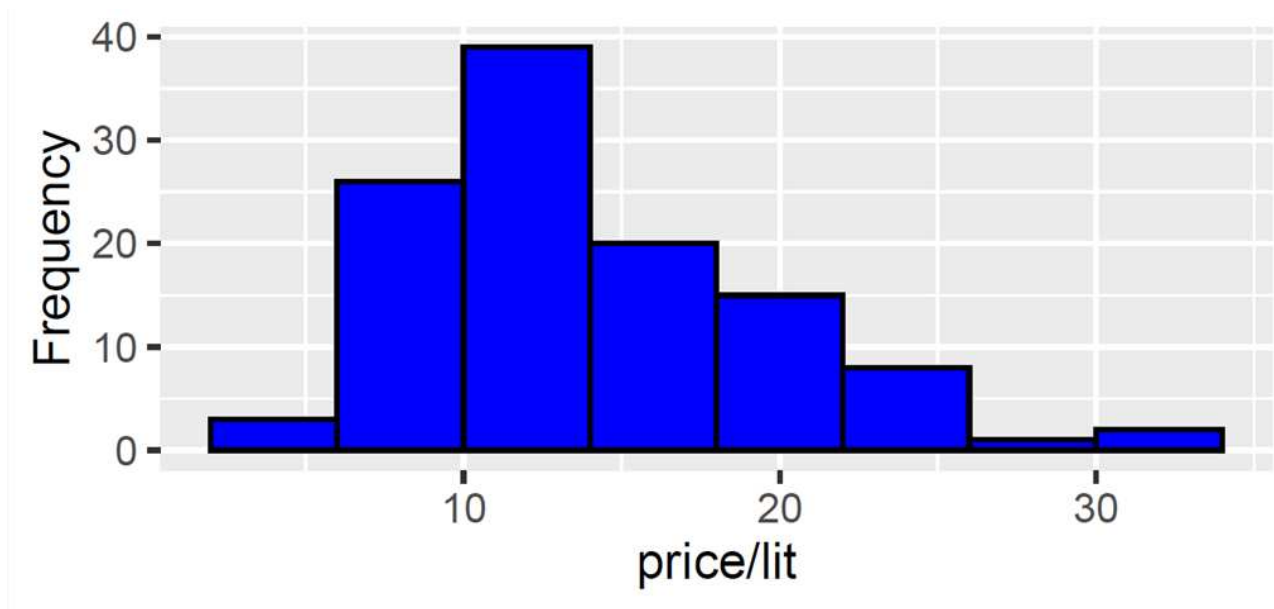
Fig 8. Histogram plot for actual prices of EVOO per 1 liter based on their frequencies

6.2. Statistical analyses of independent variables

Table 4 summarizes the characteristics of the 114 products of the sample in terms of different recorded variables. These prices are analyzed founded on the different recorded variables which include: organic labels (2 levels), Italian claim (2 levels), country of origin (Italy, EU, Spain, Greece and Portugal), GI (No GI, PDO and PGI), country of selling (Italy and Sweden), supermarkets (Aldi, Ali, Despar, Conad, Pam and Coop, Coop(se), Willys, Ica, Hemkop, Lidl), discounts (2 levels) and sizes of the bottle (0.75, <0.75 and >0.75). Regarding the organic variable, most of the sampled olive oils (78%) are non-organic products The same holds for Italian claims, since about 62% of the products are EVOO with No claim. EVOO from Italy contains most of the observations in comparison to the EU, Spain, Greece and Portugal. Additionally, regarding the share of GI's, 67% of the sampled EVOOs are without any GI, while 25% and 8% of the products are PDO and PGI olive oil, respectively. Most of the dataset is made by products sold in Italy and just 6% of the products carry discounts. The sizes are divided into 3 categories (0.75, <0.75 and >0.75), the most frequent ones being 0.75 and <0.75, both representing 39% share of the products each.

Attributes	Level	Number of observations	share
Organic	Org	25	22%
	Not Org	89	78%
Italian claim	Claim	43	38%
	No claim	71	62%
Country of origin	EU	20	18%
	Italy	83	73%
	Greece	7	6%
	Spain	3	3%
	Portugal	1	-
GI	No GI	78	67%
	PDO	27	25%
	PGI	9	8%
Country of selling	Italy	84	74%
	Sweden	30	26%
Retail Chain (Italy) Retail Chain (Sweden)	Coop	47	41%
	Pam	8	7%
	Ali	3	3%
	Aldi	3	3%
	Conad	17	15%
	Despar	6	5%
	Coop(Se)	6	5%
	Hemkop	8	7%
	Ica	9	8%
	Lidl	2	2%
	Willys	5	4%
Discount	Discount	7	6%
	No discount	107	94%
Size of the Bottle	0.75	45	39%
	>0.75	24	22%
	<0.75	45	39%

Table 4. Analyses of 8 independent variables
and the share of observations

Table 5 presents a more comprehensive analysis on the 114 observations of EVOO, analyzing the price distribution in each category of product, based on the variables considered in Table 4. These analyses improve the understanding of the market of olive oil and provide essential insights of pricing strategies. According to the calculation of average, standard deviation and also maximum and minimum of the attributes based on the prices, we obtained the below statistics. In the context of organic products, the

average price for organic EVOO is approximately 13.70 €/liter, while non-organically produced olive oils have a mean of 14.30 €/liter. In addition, the higher standard deviation in the organic category implies a greater variability in its prices.

The observed difference is counterintuitive, since the production of organic EVOO usually requires more costs by producers and growers, and organic products are usually found to receive price premiums on the market. However, it is important to note that the raw price comparison in Table 5 does not take into account the potential role of other characteristics of the products, which might explain this unexpected price difference.

According to the data of Italian claim attribute, among the 43 items analyzed, the average price for EVOO with Italian claim stands at 11.70 €/liter, while the EVOO without claim has an average of 14.30. This suggests an increase of price in case of no claim.

Regarding Geographical Indication, a notable and logical variation appears in this examination. The mean price for the product without GI is 12.13 €/liter between 78 EVOO, whereas the average price for the products with PDO and PGI is equal to 18.20 €/liter and 19.80 €/liter respectively. Additionally, it is important to note the influence of the limited availability of PGI-labeled EVOO in both the Swedish and Italian markets. The GI-labeled products which command premium prices as a result of complex process and geographical restrictions, often exhibit a significant difference in price with standard products in most of the food categories.

In examining the pricing across the different countries of origin, 5 different origins are analyzed: Italy, EU, Greece, Spain and Portugal. The highest number of observations is dedicated to Italian EVOO that according to the subject of research seems well-reasoned. The Italian EVOO average price is about 15.10 €/liter among 83 bottles. The lowest price is 9.40 euro for oils with generic EU origin, which could be explained as a result of blending low to medium quality oils which bear less expenses. The highest average price is dedicated to olive oils coming from Greece with 17.90 €/liter with 7 items. The lack of observed data may cause biases and uncertainties, mostly concerning the Greek, Spanish and Portuguese products.

The information of the country of selling seems so important as the independent factors are investigated based on these two categories. The average price for the products which are sold in Italy commands a mean price of approximately 13.60 €/liter, whereas the mean

price for the Swedish market is 15.86 €/liter. According to the facts that Italy is one of the biggest exporters and Sweden is an importer of EVOO, this noteworthy contrast sounds reasonable.

With regard to the supermarkets in our sample, the highest number of observations is dedicated to Coop in Italy with 47 items and average price of 12.50. The second supermarket is Conad with 17 items and average price of 16.70 €/liter. Based on our sample, it seems that Conad is a more expensive retail supplier in the Italian market of EVOO. In Sweden the total obtained data is 30 bottles among 5 different supermarkets. Ica has the most observations with the highest mean price (18.20 €/liter). Definitely, the low number of items observed in the Swedish market will affect the robustness of the evidence. Furthermore, there are some few products in this study which contain discounts. There is only one item carrying a discount in Sweden. There are 6 items with this variable in Italy, with the highest amount in the Coop supermarket. Among the observations PDO Terra di Bari with GI contains a discount. Interestingly, discounts are applied to 3 organically produced EVOO among 7 and also on 3 items with 100% Italian claim.

	Levels	Number of observations	Average	St.dev	Min	Max
Organic	Org	25	13.70	4.46	6.5	25.80
	Not org	89	14.30	5.92	4.5	31.80
Italian claim	Claim	43	11.70	3.53	4.5	21.70
	No claim	71	15.70	6.12	5.75	31.80
Country of origin	EU	20	9.40	2.25	5.75	13.20
	Italy	83	15.10	5.77	4.5	31.80
	Greece	7	17.90	3.14	13.36	21.56
	Spain	3	11.60	2.98	8.58	14.56
	Portugal	1	11.50	-	11.56	11.56
GI	No GI	78	12.10	4.12	4.49	25.80
	PDO	27	18.20	6.11	9.32	31.80

	PGI	9	19.80	5.47	11.87	29.33
Country of selling	Italy	84	13.60	5.72	4.50	31.80
	Sweden	30	15.86	5.06	5.58	29.33
Retail Chain (Italy) Retail Chain (Sweden)	Coop	47	12.50	5.36	4.50	31.34
	Pam	8	11.50	4.03	5.80	18.40
	Ali	3	13.80	2.88	11.33	17
	Aldi	3	9.20	0.15	9	9.32
	Conad	17	16.70	6.54	8.50	31.80
	Despar	6	18.20	3.35	9.32	23.80
	Coop(Se)	6	16.50	3.55	11.62	19.90
	Hemkop	8	12.60	2.87	9.61	17.42
	Ica	9	18.20	3.95	13.36	24.98
	Lidl	2	11.50	0.02	11.52	11.56
	Willys	5	17.90	8.71	8.58	29.33
Discount	Discount	7	11.10	2.47	7.32	15.20
	No discount	107	14.40	5.71	4.50	31.80
Size of the Bottle	0.75	45	12.70	3.20	7.32	21.07
	>0.75	24	8.60	2	4.50	12.20
	<0.75	45	18.70	5.38	11.52	31.80

Table 5. Statistical analyses of 8 independent variables

To have a deeper preliminary understanding, we also investigates the impacts of GI (No GI, PDO and PGI), Italian Claim (two levels), country of origin (Italy, EU, Spain, Greece and Portugal) and organic factors (two levels) on prices in the two countries of selling investigated. (Italy and Sweden).

This type of comprehensive model is conducted to show the importance of deep influences of each feature and to illustrate the role of the countries of selling in the olive oil market. The difference of the prices between Italy and Sweden could be representative of the market structure that is established based on the consumer's demand where different factors could change the consumers perception and pattern of purchasing items.

For instance, culture, education, awareness of environmentally friendly goods and incomes are the elements to indicate the preferences for clients (Blazquez-Resino et al., 2021).

Attributes	Levels	No. of Observation		Average of price		St.dev		Min		Max	
		Italy	Sweden	Italy	Sweden	Italy	Sweden	Italy	Sweden	Italy	Sweden
Organic	Org	17	8	13.58	14.03	5.13	2.80	6.49	11.60	25.80	19.90
	Not org	67	22	13.59	16.52	5.89	5.57	4.50	5.58	31.80	29.33
Italian claim	Claim	41	2	11.42	17.80	3.36	0.53	4.50	17.42	21.07	18.18
	No claim	43	28	15.66	15.72	6.71	5.21	5.75	8.58	31.80	29.33
Country of Origin	EU	13	7	8.46	11.02	2.27	0.91	5.75	9.61	13.20	11.78
	Italy	71	12	14.53	18.91	5.67	5.07	4.50	12.66	31.80	29.33
	Greece	-	7	-	17.93	-	3.14	-	13.36	-	21.56
	Spain	-	3	-	11.58	-	2.98	-	8.58	-	14.56
	Portugal	-	1	-	11.56	-	-	-	11.56	-	11.56
GI	No GI	55	23	11.25	14.22	4.08	3.46	4.50	8.58	25.80	19.90
	PDO	23	3	18.31	17.33	6.16	6.90	9.32	11.56	31.80	24.98
	PGI	6	4	16.88	24.16	4.51	3.68	11.87	21.46	24.40	29.33
Discounts	Discount	6	1	11.02	-	2.70	-	7.32	11.52	15.20	11.52
	No discount	78	29	13.79	16	5.85	5.08	4.50	8.58	31.80	29.33
Size of the Bottle	0.75	40	5	13.02	10.12	3.24	1.18	7.32	8.58	21.07	11.56
	>0.75	24	-	8.57	-	2	-	4.50	-	12.20	-
	<0.75	20	25	20.73	17	5.50	4.74	12.6	11.52	31.80	29.33

Table 6. Statistical analysis of prices based on the
Country of selling as dependent variable and 6 independent variables

The correlation between organic production price and the country of selling demonstrates different facts. According to Table 6, there are 17 observations, including EVOO from Italy and EU with organic labels in the Italian market, whereas the available items for organic products in the Swedish market is 8.

The average price per litter for organic EVOO and non-organic EVOO has a trace difference. Standard deviation also seems to be logical, as it shows a concentrated range of prices. The interest point is the existence of 2 organic producers in both countries which contribute to the GI certificates including PDO Umbria and PDO Mazara.

Fig 9. PDO Umbria (left) and PDO Mazara (right)

The Italian market contains 84 observations with almost half of them carrying the claim of 100% Italian. In the Swedish market between 12 imported products from Italy only 2 olive oils contain Italian claim which also do not own any GI certification. It is important to study the reason for the lack of the Italian product with "100% Italian" in the Swedish market.

The mean price for productions with claim in Italy is 11.42 €/liter and in Sweden is about 17.80 €/liter. EVOO with this claim cost less than normal EVOO, but in contrast in Swedish market the Italian products with Italian claim cost 2 euros more than oils without claim.

In the context of Geographical Indication, there are 7 products with GI certification in Sweden including PDO and PGI, whereas this value is about 29 items in Italy (only Italian GI-labeled). 2 Toscana PGI and 1 PDO Umbria EVOO are available in Sweden. In Italy, PGI items cost less than PDO observation while this is not true for Sweden. The standard deviation explains that the price of PDO products display more variability.

The mean price for PDO oil in Italy is about 18.31 €/liter and for PGI 16.88 €/liter, but in contrast the PGI products cost more than PDO in Sweden. The average price for EVOO with No GI is less than GI-labeled in both markets.

Regarding the country of origin, the Italian EVOO market contains EVOO from Italy and from the EU. In the Swedish market, the EVOO with the minimum price is dedicated to the EU EVOO and the highest price is for Italian oil with 18.91.

Regarding the discounts, this research just found 7 items with discounts in the Italian and Swedish market.

We analyzed the sizes of the bottles in 3 groups. Here, it is important to mention this fact that the mean, standard deviation, minimum and maximum are defined based on one liter of oil. In the market of Sweden 83% of the oils are bottled with the size of 0.75 liters, which has the mean price of 10.12 €/liter and 17% of the EVOO are bottled in the size lower than 0.75 liters with the mean price of 17 €/liter which is the highest among the categories. There are no observations in the Swedish market for the size greater than 0.75 liters.

In the Italian market, most of the bottles are classified with the size of 0.75 liters and the highest average price is dedicated to <0.75 liters bottles with the average price of 20.73.

6.3. Final Linear Regression

In this section we ran 2 regression models to understand and determine the extent of change in the prices for each variable. This method will help to investigate every variable's impact in order to build efficient market strategies.

Holding all other variables constant, coefficients showcase a one-unit change in the prices of EVOO in the market. P-values express whether the variable is statistically significant or not, with a threshold of 0.05. The p-values are the strong evidence to show the statistically significant relationship. The effects of the variables on prices varies; some of the predictor variables contribute to an increase, while others result in a decrease.

Referring to table 7, products with PDO labels have a coefficient of 3.20 and a p-value of 0.005, which show a statistically significant value, and this could be concluded that PDO certification will add 3.20 euros to the unit price of olive oil in the considered markets. The other parameter regarding GI, which is PGI, has a positive estimate of 2.50 and p-value of 0.076. This showcases a positive coefficient, and the related p-value could be considered as moderately significant, which could be concluded that the PGI labels affect the prices positively.

The other independent variable is discount that does not reveal a remarkable difference as the p-value is higher than 0.05 and the coefficient is a negative value.

Regarding the green labels of organic, the coefficient carries a negative value of -0.60, and the p-value strengthens the absence of the significant impact on the price unit.

Also, in the case of the Italian claim, both coefficient (-0.80) and p-value (0.414) demonstrate no substantial difference or relationship between the claim, and the prices.

About the category of sizes, both 0.75-liter bottles and larger than 0.75-liter sizes have negative estimates -8.60 and -5.40 respectively, meanwhile their p-values are statistically remarkable. Thus, it is evident that the different sizes have a meaningful effect on the prices, with the unit price decreasing as the size of the bottles gets larger.

About the country of origin of Italy, the coefficient is 2.60 and the p-value is 0.011 indicating a positive correlation between the Italian EVOO and prices, where this variable adds 2.60 euros to the unit price of olive oil in the considered markets.

In the context of the country of selling, if the country of selling is equal to Sweden, it has a positive coefficient of 4.70, although it carries a p-value larger than 0.05, that means we cannot strongly claim any strong evidence in this research, and the impact of Sweden as a country of selling is not obvious.

In the category of the supermarkets, Conad and Coop both have positive estimates of 5.30 and 4.80, respectively. Also, their p-values are less than the statistical threshold of 0.05 and this could lead to this conclusion that they have a strong impact on the price. In this sector, Ali, despar and Pam are the retail stores with positive coefficient, meanwhile they have p-values larger than the threshold and it seems that they do not impact strongly the prices in this sample.

The other supermarkets which are Ica, lidl, Hemkop and coop(sweden) do not associate with the prices as they have negative coefficients and at the same time p-values larger than 0.05.

This is important to mention that the intercept estimate of 11.70 is dedicated to the average price of EVOO which is selling in Italy, without any certification of organic, GI or Italian claim with the bottle size of less than 0.75 liters, with country of origin except Italy (EU, Spain, Greece and Portugal).

variables	Estimate	p-value
Intercept	11.70	0.000
PDO	3.20	0.005
PGI	2.50	0.076
Discount	-2.00	0.201
Organic Label	-0.60	0.508
Italian claim	-0.80	0.414
Size (>0.75)	-8.60	0.000
Size (=0.75)	-5.40	0.000
Country of origin=Italy	2.60	0.011
Country of selling = Sweden	4.70	0.084
Supermarkets = Ali	4.10	0.158
Supermarkets = Conad	5.30	0.015
Supermarkets = Coop	4.80	0.025
Supermarkets = Coop (se)	-0.90	0.681
Supermarkets = Despar	3.40	0.174
Supermarkets = Hemkop	-2.10	0.296
Supermarkets = Ica	-0.30	0.888
Supermarkets = Lidl	-2.80	0.365
Supermarkets = Pam	1.90	0.427

**Table 7. Final linear regression with the coefficients and p-values
for 8 different independent variables**

Table 8. includes the same variables as before but integrating with interactions. It means in addition to the previous values (PDO and PGI, organic, Italian claim or 100% Italian, sizing of the bottles, country of origin, discounts, country of selling and supermarkets) we ran the second model to show the influence of Sweden as country of selling with PDO, PGI, organic and Italian claim.

Regarding the PDO labels, they have a positive estimation of 2.20 but the p-value demonstrates a value larger than 0.05. So, there is not enough and strong evidence to accept the impact of PDO labels on the price.

The PGI certification has an estimate of -1.60 and the p-value, which is 0.345, both revealing no significant difference and no strong influence on the price of EVOO.

In the case of discounts, the coefficient is a negative number (-2.60) with a small p-value which does not represent a sign for impact on the price changes.

In the context of organic labels in this regression model, the coefficient of 0.30 is a positive value; however, the p-value is larger than threshold, which does not result in any notable difference.

Regarding the Italian claim, the estimate is -1.80 and the p-value is 0.063 that is more than the threshold value of 0.05. Thus, it is not possible to find remarkable evidence regarding the Italian claim's impact on the price.

Interestingly, sizes of the bottles both carry negative values, but they have both small p-values. This leads us to conclude that there is a negative association between the sizes and prices of EVOO.

The coefficient of Sweden as a country of selling in this study is 1.80 and with a large p-value (0.517). In this case there is not enough evidence to conclude a strong impact on the price. So there will be no significant change in the prices.

Regarding the supermarkets in this sample, Ali, Conad, Coop, Coop(sweden), despar, Hemkop, Ica, Pam all have positive estimates, which among them just Conad and Coop carry p-values less than the statistical threshold. The other ones have p-values larger than 0.05. Therefore, Conad and Coop are the retail markets which add 5.60 and 5.10 to the price of olive oil, respectively. Regarding Ali, coop(sweden), despar, Hemkop, Ica and Pam, they can not make a strong impact on the prices. Lidl also is the retail chain with both negative coefficient and small p-value.

Interaction between Sweden as country of selling and PDO labels has an estimate of 1.80 and the p-value in this case is 0.474 which shows a value larger than threshold. So, the evidence is not enough for receiving any remarkable changes on the prices.

Interaction between Sweden as country of selling and PGI, shows that it has a strong impact on the prices, since the coefficient is 9.80 and the p-value is 0.000.

The interaction among Sweden as country of selling and Italian claim demonstrate an estimate of 2.10 and the p-value 0.418 that is larger than 0.05 and it leads to the understanding that there are not remarkable effects of this interaction on the price.

The interaction among Sweden as country of selling and organic certificates have a negative value of -2.50 and the p-value showcases that there is a lack of evidence to indicate a significant relationship between this interaction and price.

Coefficients	Estimate	p-value
Intercept	12.30	0.000
PDO	2.20	0.056
PGI	-1.60	0.345
Discount	-2.60	0.074
Organic Label	0.30	0.719
Italian claim	-1.80	0.063
Size (>0.75)	-9.20	0.000
Size (=0.75)	-5.60	0.000
Country of origin = Italy	2.80	0.003
Country of selling = Sweden	1.80	0.517
Supermarkets = Ali	4.00	0.139
Supermarkets = Conad	5.60	0.006
Supermarkets = Coop	5.10	0.001
Supermarkets = Coop (se)	2.00	0.363
Supermarkets = Despar	3.90	0.091
Supermarkets = Hemkop	0.30	0.871
Supermarkets = Ica	0.70	0.721
Supermarkets = Lidl	-0.60	0.847
Supermarkets = Pam	2.40	0.283
Sweden*PDO	1.80	0.474
Sweden*PGI	9.80	0.000
Sweden* Italian claim	2.10	0.418
Sweden*Organic	-2.50	0.151

Table 8. Final linear regression with the coefficients and p-values for 8 different independent variables and their prices, including interactions terms based on Sweden as country of selling

From table 7, this could be concluded that the only independent values with notable and strong influences on the prices are PDO, country of origin of Italy, Conad and Coop supermarkets. From table 8, it is evident that the country of origin of Italy, Conad and Coop supermarkets, and the interaction of Sweden with PGI-labeled EVOO represent strong impacts.

Chapter 7. Discussion

What are the main determinants of the market price change in the olive oil sector? The price fluctuation is a complex phenomenon which is invented as the combination of many elements in the market, from natural factors to supply and demand indicators. The factors which implement changes in the market prices in the supply-demand chain are influenced widely by the type of food production. For example, the trends regarding organic and sustainable agriculture, GI importance in the economy of the countries and purchasing of domestic products affect the market prices of olive oil even on a global scale.

This study is based on a sample of EVOO products collected in Italian and Swedish online supermarkets. Overall, the average price for olive oil sold in Italy is lower than the one for olive oil sold in Sweden, where, on average, it costs around 2.30 euros more. This could be due to the more widespread consumption of olive oil in Italy, whereas in Sweden the consumption of olive oil has a more specialty character. In addition, from the supply side, the higher price is probably due to the fact that Sweden is an import country. The hedonic regression analyses confirm the existence of a positive price gap difference in the price of EVOO in the two countries.

The import sector should be monitored regarding the olive oil standards in countries like Sweden with high consumption. In 2020 the Swedish Food Agency reported the suspicion of some olive oil production and non-compliance of the qualifications. The organoleptic analysis was performed and consequently, despite many objections, Di Luca & Di Luca company, that imports Mediterranean foods by Zeta Classico and Original brands turned out to be "lampante" and have been taken off the market (Daniel Dawson, 2020)

The results of this study show that the organic certification does not add value to the olive oil. This seems counterintuitive since, as mentioned before, the process of production causes higher-costs in the organic sector. The recent trends, aiming at supporting more organic foods and sustainable farmlands, lead to integration of organic products into society with the purpose of increasing the utilization of sustainable agriculture. For instance, since 2015 in Italy, the schools' canteens required to include at least 15% of

meat and about 40% of the fruits and vegetables in their canteen meals with the organic labels, or assigning awards for the canteens in schools or institutions who use 90% organic foods. In Sweden, in 2006, policy makers legalized frameworks and law to enhance the organic farmlands by 20% and increase the consumption of organically produced foods to 25% in canteens (Willer et al., 2021). The perceptions of organic food products could be different among nations and cultures, even distinct food categories. (Raimondo et al., 2021)claims that in some cases, targeted buyers consider EVOO as a healthy product intrinsically and respond negatively to organic olive oils, which in our research also demonstrated less expensive than the common EVOO. In comparison a hedonic pricing study showcases a positive impact on the price for organic German cheese which is also affected by the type of shop store (Schröck, 2014). This interest in purchasing organic cheese as a dairy product could be as a result of many severe diseases caused by contaminated milk or sick livestock and the more awareness of people about milk-related disease rather than other foodstuffs.

To address why organic products do not receive a premium price, we can attribute this to a lack of awareness regarding organic products and no necessity to choose organic goods from the consumer's standpoint. The low interest to pay higher for organic products also may be because of this idea that consumers in countries who are pure importers, do not consider the crucial role of sustainable or environmentally friendly agriculture in the exporter origin and prioritize to buy standard EVOO or with GI-labeled. However, for raising the awareness of the customers, increasing the transparency of the organic claims on the labels could be helpful, also, as the high sensitivity of the organic products (freshness and limited shelf time), logistical attributes seem to carry a pivotal attribute. However, the producers are willing to improve the concept of organic products in the olive oil sector. The expansion of organic farmlands creates an opportunity for growers to benefit from long term sustainability, soil viability, biodiversity and the more productivity of the lands. Due to the high standards regulation, these categories benefit from trusted marketing strategies and high reputation.

According to our hedonic regression model, PDO and PGI EVOO add 3.20 and 2.50 euros to unit price, respectively. Due to the high expenses in this sector that could be related to

the treatments, certifications and education, this enhancement in the price is reasonable. It is noteworthy to mention that the higher prices are also a result of the customers' willingness to pay (WTP) for this category of products (GI-labeled). The rise of price regarding this attribute is more significant in comparison to other variables in this research.

To mention an increase in the price due to GI products, (Török et al., 2020) calculated a higher value premium for GI products with consideration of market size, quality and reputation in the Mediterranean trading market scale. The article claimed that GI is a factor to promote the concept of higher income in rural and fostering local food products; moreover, an interaction of GI-labeled foods with tourism industry is interesting.

From the demand side, (Cei et al., 2018) emphasizes that GI-labeled items gain more WTP in comparison with products without GI. The higher WTP is in association with perceived quality, traceability and sustainable agriculture. Incidentally, the role of consumer's characteristics like income, culture, awareness and knowledge, appear essential.

Nevertheless, this increase in the final price does not mean an efficient criterion for PDO or PGI producers or farmer's profitability. On the other hand, one research conducted by (Réquillart, 2007) regarding Parmigiano Reggiano cheese in Italy demonstrates negative financial aspects for the milk producers, when they sell the products to private enterprises. Accordingly, the overall profitability of GI needs multidimensional investigation in more detail. Also, WTP is higher in the case of PDO olive oil compared to PGI (Menapace et al., 2011).

Implementing policies such as promotion of modern values like sustainability or providence of natural landscapes, representation of long-term aims among European investors, stronger methods and strategies and governmental support are the other needed requirements in the GI sector.

In the sector of Italian claim, it is observed that the estimates are not significant. Therefore, technically, no price difference exists between olive oil with and without the Italian claim.

In contrast, Italy as a country of origin receives a positive value. Producers with the claim of 100% Italian may sell EVOO with lower prices rather than Italian Origin. In this study

the most Italian EVOO imported to Sweden received "Made in Italy" as an Italian signal rather than 100% Italian.

In the EVOO market trade, it is mandatory to indicate the origin of the oils on the labels, unlike many other products.[17]

So, the higher attention toward the "Made in Italy" rather than "100% Italian" might be understandable from this fact that consumers in the market will search for the country of origin. Therefore, the claim for the origin of oil in other formats like 100% Italian, receives less attention. Meanwhile, it is noteworthy that consumers might respond differently to "Italian claim" on other types of food products, which depends highly to the type of food and trading market.

For instance, articles like (Bonaiuto et al., 2021) which evaluates the Italian claim on different kinds of production, highlights the effect of this value that increases the reputation and the perception of the consumers toward high quality. Such this result highlights the specific added value of being Italian in the consumption sector of agricultural and food products. Many studies mentioned that the influence of the country of origin on consumer decisions can be referred to as home-biased decisions. For instance, Italian consumers are willing to pay a premium of 35% to 41.8% for 100% Italian EVOO. Similarly, Tunisian and Chilean consumers show a strong preference for products from their own countries over imported EVOO from Italy or Spain. In contrast, consumers from non-producing countries such as Japan display different behavior. While they generally favor Italian EVOO over Spanish or Tunisian products (Latino et al., 2022), there is also a notable inclination towards purchasing Tunisian and Mediterranean EVOO, linked to the popularity of the "Mediterranean diet" (Kashiwagi et al., 2008).

Due to the 7 observations of EVOO in the discount part, it is mandatory to understand the behavior of consumers who are facing different kinds of offers in supermarkets. The variations of promotion's types in the food market play an impulsive role in the purchasing step. It contains usage of mottos, limited-time offers, presenting free gifts or free samples of which in our case the promotion is dedicated to price discounts. (Vigna & Mainardes, 2019) who conducted a study in the food market of Brazil analyzing the influences of

---

[17] https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32012R0029

discounts on clients, which says, that "price discounting is recognized as the most common consumer advantage mechanism." Price discounts are explained as an effective and attractive tool, valued by customers that build a reliable connector between consumers and companies. In this perspective, sometimes the different kinds of promotion effectiveness on the buyers differ, based on various foodstuff's qualifications, which disagree with the positive impacts of price promotions. For example, it is important to consider the concept of certificated EVOO`s on sales, and whether these two factors are connected to each other or not, whereas in the present study there are 3 organic EVOO in 7 discounted items. People who are interested in purchasing GI or organic items are also sensitive in case of economic sustainability where probably small and local producers will not sell productions on discounts. In other words, customers with high interest in offers or discounts might not be so willing to consider the organic farms or originality. Consequently, the presence of price discounts in the mentioned framework acts as a negative influencer. (Polenzani et al., 2020)

Supermarkets play a crucial role in these models. The highest mean prices are dedicated to Conad with highest coefficient for Italian market and ICA in Sweden. The whole data around pricing in this survey was implemented from main supermarkets in urban areas. Regardless of this, it seems crucial to understand the role of the other types of markets which are not negligible.

The country of origin is the other fact that determines significant differences in price. Among EVOO in Italy, the observations contain 71 Italian oil and 13 EU oil. As mentioned before in part 2.1 the export from Spain to Italy is recorded due to the high demand, while in this thesis, there is no oil with "Made in Spain" label in the Italian market. This fact could be considered as a method of using Spanish oils in blended products (see part 2.1). So, buyers in our sample in Italy face limited choices in the case of country of origin. Furthermore, marketing routes and producers just focus on these two origins, and it seems reasonable as Italy is one of the biggest producers of olive oil and selling other EVOO from Mediterranean areas in the market seems less common than in non-traditional olive oil countries. In this project products from Greece sold in Sweden are more expensive than the Italian ones. According to the fact that Sweden is a consumer

country rather than producer the variability of the importers is high. Sweden is interested in importing olive oils from Italy and the variation of the country of origin refers to 5 origins. It conveys that consumers in Sweden or other non-producing countries own more choices in this context. In a hedonic-based investigation by (Schröck, 2014), that analyzes WTP regarding country of origin for German cheese, a significant increase in prices appears for cheeses from abroad in comparison with German products. Also, this article mentions that it is noteworthy to build a strong structure for responding supply and demand by importing products with specific country of origins, where Germany implements this with cheeses coming from Ireland, Belgium, France, Spain which are dedicated as high quality producers in the cheese sector. This could be a practical method to sell the domestic products which carry lower prices in the market. Since, variations in climate conditions, soil features and other natural resources are defined as the specified qualifications of a country, therefore (Gilmore, 2001) introduce country of origin as `country brands`. This can illustrate the crucial role of a country of origin. In an investigation conducted in Germany, it is stated that the country of origin must be examined separately from geographical qualifications like PDO or PGI (Menapace et al., 2011). In (Menapace et al., 2011) the point is that GI are the representative of a small region or small city which most often are located in rural areas. While country of origin pointed out the special attributes which demonstrate the indications of a country. The presence of country of origin on the labels like Made in Italy or Made in Greece, seem more interesting for buyers regarding product categories like wine, coffee, or olive oils (Schröck, 2014). More information could be obtained from studying the possibility of deep influences on agricultural policies or market strategies through the contribution of country of origin and GI. In this context these two factors will implement premium prices in the market of exporters. However, country of origin seems to have a lower impact on price premium, in contrast to what was found in (Menapace et al., 2011).

Does the packaging size cause any challenges for consumers or exporters? In this sample, due to the fact that in the market, smaller sizes receive a higher unit price, it seems reasonable that bottles with sizes of 0.75 and >0.75, are sold at lower unit price. An investigation conducted to figure out the importance of sizes of the bottles in the market of olive oil, and in the context, sizing is expressed in two different viewpoints. In

the market the bottle sizes do not stand as a quality index, while it is considered just as value influencers for money. Accordingly, purchasers prefer the smallest sizes of olive oil bottles because it fits with their needs in olive oil and it gives better value for money than other sizes (Trabelsi Trigui & Abdelmoula, 2019).

As in this study we analyzed the different drivers in the market, we can gauge what kinds of attributes attract producers in the olive oil trading market as a source of price premiums. As evidenced by this study the consumers in Italy and Sweden responded differently to the variables. Generally, the priority of the producers to benefit from which attributes, is highly dependent on the targeted market. To a deeper understanding of the target market, we divided the target markets based on the country of selling, that are Italy and Sweden.

Nowadays, consumers seem to gain more knowledge about organic farming and sustainable agriculture, especially in developed countries. So, in both Italy and Sweden the trends of environmentally friendly agriculture might receive positive reactions in the case of olive oil. Therefore, the exporting of agricultural products with organic claims could face various behaviors, where for instance due to the price sensitivity or lack of awareness about green labels in developing countries, they influence purchasing decisions.

Due to this fact that olive oil is a traditional food product that is integrated by the Italian consumer's Mediterranean diet, it seems that Italian market considers olive oil more than an edible oil. Thus, tradition, local products and geographical origin could be one of the most important factors from the producers' standpoint. In the case of GI's, the producers should be aware of the reputation of the GI and the age of it. In another word, the awareness of the targeted market regarding GI-labeled products could vary among developed and developing countries. Incidentally, as Italy contains the most GI olive oil, it motivates more investments in this field. Also, regarding the producers who focus on exporting to other countries, it is important to consider consumer behavior on a global scale. For example, developing countries respond differently in comparison to developed countries towards environmental-friendly agriculture (Mustafa et al., 2022).

Purchasing decisions regarding the consumers from targeted market of Sweden, which is a non-producing country, might have different motivators. For example, it could be

predictable that Country of origin is the feature that is preferred in comparison with PDO and PGI labels, as the "Made in Italy" on the bottles seems sufficient and more familiar over GI labels. In addition, the price sensitivity in the importing countries performs an important role, meanwhile the perceived quality of EVOO in the market, simultaneously, is considered one of the determinants. So, making a balance between prices and quality perception seems challenging.

Regarding the markets like Sweden with high consumption and large amount of import, the producers must consider the packaging, accessibility of the production, best distribution channels and transparent information on the labels.

Chapter 8. Conclusion

In the food sector price acts like a sensitive element. This condition could be beneficial or problematic for both consumers and producers. Nowadays consumer preferences have changed according to trends, global concerns about sustainability, cultural differences, and health benefits. Therefore, integrating different aspects of agriculture, especially in the case of Mediterranean foods, like development of rural agriculture, utilizing outlines of sustainability systems, trends of Mediterranean diet and the consequences benefits should be considered. Actually, it is important to create new backgrounds to understand the consumer's demand in the food market. In this way the establishments or producers are the key indicators who define and explain quality definition to the buyer, as they own the marketing leverages. Marketing leverages are those which could play as an advantage or disadvantage, when customers seek to fulfill their needs across the different variables, like country of origin, PDO or PGI certification, Italian claims and green label of organic products. On the other hand, decision makers like producers, farmers or growers, utilize these tools to add value to their production, and thus increase their revenues and, ultimately, income.

In this thesis, we investigate how much current prices of extra virgin olive oil in Italy and Sweden are affected by extrinsic values. In the case of organically produced foodstuffs, although the knowledge and concept of sustainable agriculture increased more than ever, the population of these categories of food products has a long way, to obtain premium prices and attract consumers.

Moreover, the GIs could find their ways by attracting consumers particularly among those who are sensitive about the origin of the traditional products. Meanwhile, the importance of country of origin is not negligible. In contrast, the Italian claim does not showcase much of an interest in premium prices. Therefore, although it seems easy to sell the products to olive oil consumers who are aware of the numerous health benefits of the EVOO, there is a need to monitor the supply-demand chain relation, as well as awareness and interest and an awareness of the quality and its definition n extrinsic attributes of olive oil.

References

A country- can it be repositioned Spain. (Gilmore, 2001.).

Aprile, M. C., Caputo, V., & Nayga, R. M. (2012). Consumers' valuation of food quality labels: The case of the European geographic indication and organic farming labels. *International Journal of Consumer Studies*, *36*(2), 158–165. https://doi.org/10.1111/j.1470-6431.2011.01092.x

Becker, T. (2000). Consumer perception of fresh meat quality: a framework for analysis. In *British Food Journal* (Vol. 102, Issue 3). # MCB University Press. http://www.emerald-library.com

Bimbo, F., Bonanno, A., & Viscecchia, R. (2023). Geographical indications' prices and marketing margins: the role of group size, longevity and production decisions. *British Food Journal*, *125*(1), 286–301. https://doi.org/10.1108/BFJ-09-2021-1000

Bimbo, F., Roselli, L., Carlucci, D., & de Gennaro, B. C. (2020). Consumer misuse of country-of-origin label: Insights from the Italian extra-virgin olive oil market. *Nutrients*, *12*(7), 1–12. https://doi.org/10.3390/nu12072150

Blazquez-Resino, J. J., Gutierrez-Broncano, S., Jimenez-Estevez, P., & Perez-Jimenez, I. R. (2021). The effect of ethnocentrism on product evaluation and purchase intention: The case of extra virgin olive oil (EVOO). *Sustainability (Switzerland)*, *13*(9). https://doi.org/10.3390/su13094744

Bonaiuto, F., De Dominicis, S., Ganucci Cancellieri, U., Crano, W. D., Ma, J., & Bonaiuto, M. (2021). Italian Food? Sounds Good! Made in Italy and Italian Sounding Effects on Food Products' Assessment by Consumers. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.581492

Bonanno, A., Sekine, K., & Feuer, H. N. (n.d.). *Geographical Indication and Global Agri-Food; Development and Democratization*.

Buckland, G., & González, C. A. (2010). Trends in Olive Oil Production, Supply and Consumption in Mediterranean Countries from 1961 to the Present Day. In *Olives and Olive Oil in Health and Disease Prevention* (pp. 689–698). Elsevier Inc. https://doi.org/10.1016/B978-0-12-374420-3.00072-3

Bulk Exports from Greece Help Fuel the Italian Olive Oil Industry - Olive Oil Times. (n.d.). Retrieved April 22, 2024, from https://www.oliveoiltimes.com/business/bulk-exports-from-greece-help-fuel-the-italian-olive-oil-industry/111862

Carlucci, D., De Gennaro, B., Roselli, L., & Seccia, A. (2014). E-commerce retail of extra virgin olive oil: An hedonic analysis of Italian Smes supply. *British Food Journal*, *116*(10), 1600–1617. https://doi.org/10.1108/BFJ-05-2013-0138

Cavallo, C., Caracciolo, F., Cicia, G., & Del Giudice, T. (2018). Extra-virgin olive oil: are consumers provided with the sensory quality they want? A hedonic price model with

sensory attributes. *Journal of the Science of Food and Agriculture*, *98*(4), 1591–1598. https://doi.org/10.1002/jsfa.8633

Cei, L., Defrancesco, E., & Stefani, G. (2018a). From geographical indications to rural development: A review of the economic effects of European Union policy. *Sustainability (Switzerland)*, *10*(10). https://doi.org/10.3390/su10103745

Climate Disasters Drive Prices Higher - Olive Oil Times. (n.d.). Retrieved April 6, 2024, from https://www.oliveoiltimes.com/business/climate-disasters-drive-prices-higher

Coluccia, B., Agnusdei, G. P., Miglietta, P. P., & De Leo, F. (2021). Effects of COVID-19 on the Italian agri-food supply and value chains. *Food Control*, *123*. https://doi.org/10.1016/j.foodcont.2020.107839

Consonni, R., & Cagliani, L. R. (2010). Nuclear Magnetic Resonance and Chemometrics to Assess Geographical Origin and Quality of Traditional Food Products. *Advances in Food and Nutrition Research*, *59*, 87–165. https://doi.org/10.1016/S1043-4526(10)59004-1

Delgado, C., & Guinard, J. X. (2011). How do consumer hedonic ratings for extra virgin olive oil relate to quality ratings by experts and descriptive analysis ratings? *Food Quality and Preference*, *22*(2), 213–225. https://doi.org/10.1016/j.foodqual.2010.10.004

Espejel, J., Fandos, C., & Flavián, C. (2007). The role of intrinsic and extrinsic quality attributes on consumer behaviour for traditional food products. *Managing Service Quality*, *17*(6), 681–701. https://doi.org/10.1108/09604520710835000

E.U. Green Lights €100M Subsidy for Italian Olive Millers - Olive Oil Times. (n.d.). Retrieved July 4, 2024, from https://www.oliveoiltimes.com/business/e-u-green-lights-e100m-subsidy-for-italian-olive-millers/113020

Extra Virgin Olive Oil Sales in Spain Fell by 40 Percent in 2023 - Olive Oil Times. (n.d.). Retrieved July 1, 2024, from https://www.oliveoiltimes.com/business/extra-virgin-olive-oil-sales-in-spain-fell-by-40-percent-in-2023/127521

Galati, A., Siggia, D., Crescimanno, M., Martín-Alcalde, E., Saurí Marchán, S., & Morales-Fusco, P. (2016). Competitiveness of short sea shipping: the case of olive oil industry. *British Food Journal*, *118*(8), 1914–1929. https://doi.org/10.1108/BFJ-05-2016-0193

Girard, T., & Dion, P. (2010). Validating the search, experience, and credence product classification framework. *Journal of Business Research*, *63*(9–10), 1079–1087. https://doi.org/10.1016/j.jbusres.2008.12.011

How Retail Supply Chains Can Prepare for the Surge in Organic Food Sales | SupplyChainBrain. (n.d.). Retrieved July 5, 2024, from https://www.supplychainbrain.com/blogs/1-think-tank/post/37849-how-retail-supply-chains-can-prepare-for-the-surge-in-organic-food-sales

Hussain, H. (2016). Buying Local or Imported Goods? Profiling Non-income Consumers in Developing Countries. *International Review of Management and Marketing*, *6*(4), 688–695. http://econjournals.com/index.php/irmm/article/download/2751/pdfhttp:www.econjournals.com

International Olive Oil Council. (2011).

International federation of organic agriculture movements., & Forschungsinstitut für biologischen Landbau (Suisse). (2021a). *The world of organic agriculture : statistics & emerging trends 2021*. FiBL.

International federation of organic agriculture movements., & Forschungsinstitut für biologischen Landbau (Suisse). (2021b). *The world of organic agriculture : statistics & emerging trends 2021*. FiBL.

Italian Farmers Take Stock of Current Harvest, Look Ahead to Challenges - Olive Oil Times. (n.d.). Retrieved April 2, 2024, from https://www.oliveoiltimes.com/production/italian-farmers-take-stock-of-current-harvest-look-ahead-to-challenges/117802

Jada, K. S., Melesse, M. B., & van den Berg, M. (2023). The effects of safety certification and nutrition messaging on the demand for nutritionally enhanced food in urban Ethiopia. *Food Security*, *15*(2), 395–409. https://doi.org/10.1007/s12571-022-01327-3

Kapellakis, I. E., Tsagarakis, K. P., & Crowther, J. C. (2008). Olive oil history, production and by-product management. In *Reviews in Environmental Science and Biotechnology* (Vol. 7, Issue 1, pp. 1–26). https://doi.org/10.1007/s11157-007-9120-9

Kashiwagi, K., Erraach, Y., Arfa, L., & Zaibet, L. (2020). Growing olive oil export and intra-industry trade in Mediterranean countries: Application of gravity model. *Sustainability (Switzerland)*, *12*(17). https://doi.org/10.3390/su12177027

Kashiwagi, K., Zaibet, L., & Nagaki, M. (2008). *Exploring Japanese olive oil consumer behavior Exploring Japanese olive oil consumer behavior Exploring Japanese olive oil consumer behavior*. https://www.researchgate.net/publication/23510036

Lanfranchi, M., Algeri, C., Dimitrova, V., Pascale, A. De, & Giannetto, C. (2024). Analyzing consumer willingness to pay for organic extra virgin olive oil: A logit model approach. *International Journal of Innovative Research and Scientific Studies*, *7*(1), 81–91. https://doi.org/10.53894/ijirss.v7i1.2504

Latino, M. E., De Devitiis, B., Corallo, A., Viscecchia, R., & Bimbo, F. (2022). Consumer Acceptance and Preference for Olive Oil Attributes—A Review. In *Foods* (Vol. 11, Issue 23). MDPI. https://doi.org/10.3390/foods11233805

Mandal, P. C. (2020). Country of Origin and Consumer Perceptions. *International Journal of Business Strategy and Automation*, *1*(4), 73–86. https://doi.org/10.4018/ijbsa.2020100105

Marcoz, E. M., Melewar, T. C., & Dennis, C. (2016). The Value of Region of Origin, Producer and Protected Designation of Origin Label for Visitors and Locals: The Case of Fontina Cheese in Italy. *International Journal of Tourism Research*, *18*(3), 236–250. https://doi.org/10.1002/jtr.2000

Menapace, L., Colson, G., Grebitus, C., & Facendola, M. (2011). Consumers' preferences for geographical origin labels: Evidence from the Canadian olive oil market. *European Review of Agricultural Economics*, *38*(2), 193–212. https://doi.org/10.1093/erae/jbq051

Mili, S., & Bouhaddane, M. (2021). Forecasting global developments and challenges in olive oil supply and demand: A delphi survey from Spain. *Agriculture (Switzerland)*, *11*(3), 1–25. https://doi.org/10.3390/agriculture11030191

Millán-Vazquez de la Torre, M. G., Arjona-Fuentes, J. M., & Amador-Hidalgo, L. (2017). Olive oil tourism: Promoting rural development in Andalusia (Spain). *Tourism Management Perspectives*, *21*, 100–108. https://doi.org/10.1016/j.tmp.2016.12.003

Montero, J.-M., & Fernández-Avilés, G. (n.d.). *Hedonic Level of Affect ▶ Affective Component of Happiness Hedonic Price Model*.

Müller, L. (2003). The Swedish East India trade and international markets: Re-exports of teas, 1731–1813. *Scandinavian Economic History Review*, *51*(3), 28–44. https://doi.org/10.1080/03585522.2003.10414232

Mustafa, S., Hao, T., Jamil, K., Qiao, Y., & Nawaz, M. (2022). Role of Eco-Friendly Products in the Revival of Developing Countries' Economies and Achieving a Sustainable Green Economy. *Frontiers in Environmental Science*, *10*. https://doi.org/10.3389/fenvs.2022.955245

Olive oil - European Commission. (n.d.). Retrieved July 1, 2024, from https://agriculture.ec.europa.eu/farming/crop-productions-and-plant-based-products/olive-oil_en

Orlandi, F., Rojo, J., Picornell, A., Oteros, J., Pérez-Badia, R., & Fornaciari, M. (2020). Impact of climate change on olive crop production in Italy. *Atmosphere*, *11*(6). https://doi.org/10.3390/atmos11060595

Pagliuca, M. M., & Scarpato, D. (2011). Food quality, consumer perception and preferences: An analysis on olive oil. *Electronic Journal of Applied Statistical Analysis*, *4*(2), 215–226. https://doi.org/10.1285/i20705948v4n2p215

PANAGODIMOU, E., ROUSSIS, I., PAPADAS, C. T., & BILALIS, D. (2019). A Comparison of Cost in Organic and Conventional Olive Oil Production in Greece. *Bulletin of University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca. Horticulture*, *76*(1), 127. https://doi.org/10.15835/buasvmcn-hort:2018.0044

Pehlivanoğlu, F., Erarslan, C., & Demir, S. (2021). Factors affecting competition in olive oil exports: Panel data analysis of selected countries. Case study. *Agricultural Economics (Czech Republic)*, *67*(12), 511–518. https://doi.org/10.17221/494/2020-AGRICECON

Polenzani, B., Riganelli, C., & Marchini, A. (2020). Sustainability perception of local extra virgin olive oil and consumers' attitude: A new Italian perspective. *Sustainability (Switzerland)*, *12*(3). https://doi.org/10.3390/su12030920

Raimondo, M., Caracciolo, F., Nazzaro, C., & Marotta, G. (2021). Organic farming increases the technical efficiency of olive farms in Italy. *Agriculture (Switzerland)*, *11*(3), 1–15. https://doi.org/10.3390/agriculture11030209

Réquillart, V. (2007). *On the Economics of Geographical Indications in the EU On the Economics of Geographical Indications in the EU On the Economics of Geographical Indications in the EU*. https://www.researchgate.net/publication/228637386

Román, R. A., Amorós, J. A., Pérez De Los Reyes, C., Navarro, F. J. G., Bravo, S., Essiari, M., Zouhair, R., & Chimi, H. (2014). *Major and trace element content of olive leaves Contribution to the study of the typical characteristics of the virgin olive oils produced in the region of Sais (Morocco)*. www.internationaloliveoil.org

Sánchez Moral, P., & Ruiz Méndez, M. V. (2006). Production of pomace olive oil. *Grasas y Aceites*, *57*(1). https://doi.org/10.3989/gya.2006.v57.i1.21

Santucci, F. M. (2002). *Organic farming in Italy*. https://www.researchgate.net/publication/279483423

Santucci, F. M., Callieris, R., & Bello, D. (2021). Organic olive oil in Italy: a missed opportunity? In *Bulgarian Journal of Agricultural Science* (Vol. 27, Issue 6).

Scarpa, R., & Gludice, T. Del. (2004). Market segmentation via mixed logit: Extra-virgin olive oil in Urban Italy. *Journal of Agricultural and Food Industrial Organization*, *2*(1), 141–160. https://doi.org/10.2202/1542-0485.1080

Schröck, R. (2014). Valuing country of origin and organic claim: A hedonic analysis of cheese purchases of German households. *British Food Journal*, *116*(7), 1070–1091. https://doi.org/10.1108/BFJ-12-2012-0308

Sgroi, F., Foderà, M., Di Trapani, A. M., Tudisca, S., & Testa, R. (2015). Cost-benefit analysis: A comparison between conventional and organic olive growing in the Mediterranean Area. *Ecological Engineering*, *82*, 542–546. https://doi.org/10.1016/j.ecoleng.2015.05.043

Small Sampling in Sweden Spurs Debate on Tasting Panels - Olive Oil Times. (n.d.). Retrieved April 7, 2024, from https://www.oliveoiltimes.com/grades/small-sampling-in-sweden-spurs-debate-on-tasting-panels/80413

Tempesta, T., & Vecchiato, D. (2019). Analysis of the factors that influence olive oil demand in the Veneto region (Italy). *Agriculture (Switzerland)*, *9*(7). https://doi.org/10.3390/agriculture9070154

The European market potential for olive oil | CBI. (n.d.). Retrieved July 2, 2024, from https://www.cbi.eu/market-information/processed-fruit-vegetables-edible-nuts/olive-oil/market-potential

Thiene, M., Galletto, L., Scarpa, R., & Boatto, V. (2013). Determinants of WTP for Prosecco wine: A latent class regression with attitudinal responses. *British Food Journal*, *115*(2), 279–299. https://doi.org/10.1108/00070701311302249

Török, Á., Jantyik, L., Maró, Z. M., & Moir, H. V. J. (2020). Understanding the real-world impact of geographical indications: A critical review of the empirical economic literature. In *Sustainability (Switzerland)* (Vol. 12, Issue 22, pp. 1–24). MDPI. https://doi.org/10.3390/su12229434

Trabelsi Trigui, I., & Abdelmoula, M. (2019). The Effect of Packaging Size on Purchase Intention: The Case of Tunisian Olive Oil in the USA Market. *International Journal of Business and Economics Research*, *8*(5), 320. https://doi.org/10.11648/j.ijber.20190805.19

Trienekens, J., & Zuurbier, P. (2008). Quality and safety standards in the food industry, developments and challenges. *International Journal of Production Economics*, *113*(1), 107–122. https://doi.org/10.1016/j.ijpe.2007.02.050

Verdonk, N., Wilkinson, J., Culbert, J., Ristic, R., Pearce, K., & Wilkinson, K. (2017). Toward a model of sparkling wine purchasing preferences. *International Journal of Wine Business Research*, *29*(1), 58–73. https://doi.org/10.1108/IJWBR-10-2015-0048

Verlegh, P. W. J., & Steenkamp, J.-B. E. M. (1999). PsycINFO classi®cation: 3900. In *Journal of Economic Psychology* (Vol. 20). www.elsevier.com/locate/joep

Vigna, J. P., & Mainardes, E. W. (2019). Sales promotion and the purchasing behavior of food consumers. *Revista Brasileira de Marketing*, *18*(3), 101–129. https://doi.org/10.5585/remark.v18i3.16368

Vos, A. D. (n.d.). *The Future of Organic Food in Swedish Retail Department of People and Society Master programme: Sustainable Food Systems*.

Vossen, P. (n.d.). *Olive Oil: History, Production, and Characteristics of the World's Classic Oils*.

Willer, H., Trávníček, J., & Schlatter, B. (2024). *A bouquet of first-hand expertise Agricu lture et biodive rsité Impact de différents systèmes de culture sur la diversité biologiqu e Technic al*

guide Cow-re ared Calf Husba ndry in Dairy Farmin g Housing Systems for Species-s pecific Rearing with Mother Cows and Nurse Cows. http://www.organic-world.net/yearbook/yearbook-2024.html.