Olive oils protected by the EU geographical indications: creation and distribution of the value-adding within supply chains

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Abstract. The world olive oil market is characterized by a growing price competition on the supply side. Economy of scales and low production costs from both traditional and more recent producing Countries determine an increasing pressure on European Union (EU) olive farmers that suffer lower revenues. Product differentiation, driven by higher quality and consumer expectations, is one of the most powerful competitive strategies that EU farmers may adopt to face this challenge. Geographical indications established by the EU (PDO and PGI) can be successful marketing levers to ensure olive oil differentiation based on high quality standards and geographical origin of production. These EU quality certification schemes were designed to respond to consumer demand, to ensure intellectual property protection for the most qualifying products, and to provide farmers with a fair share of the added value. There is a wide literature about the PDOs' economic and social impacts, but only few studies analyze their benefits and costs along the supply chain. By investigating the added value generation process within an Italian PDO olive-oil supply chain ("Terra di Bari" PDO), this work aims to evaluate the effectiveness of PDO certification schemes in improving farm's profitability. The study was performed directly interviewing a sample of the most representative farmers, manufacturers and stakeholders of the PDO olive oil supply chain localized in the Province of Bari (Puglia, Italy).

Keywords: olive oil, protected designation of origin, supply chain, value-chain.

1. Introduction

It is widely recognized that the recent changes in the agro-food systems are part of a wider evolution of both the societies and the economic systems. The incoming scenario, continuously adapting, presents interesting implications for strategic management. One of the main issues is the disappearance of a clear boundary between end-products and services. The difference between products and services is progressively less evident, with the "tangible" component normally bounded to products being fulfilled by the embedded services that, in turn, often contribute to the largest share of the value. These statements are particularly true for typical products and for PDO/PGI olive oils. The intangible assets embedded in these olive oils belong to the environmental and cultural sphere of the territory they belong to. These assets contribute to the definition of services taking part to the value creation process of the end-product. Items as the "image" of the territory, the specific competencies and cultures of the production process, the cares of both the local population and institutions, all contribute in different ways to the perception of the value, embedding the services and the tradition to the product itself.

On the other side, the value generation process cannot be set apart of the structural, managerial, technologic and organizational features of the firms. Strategic and managerial choices determine the effectiveness of the unique value generation process that these typical products base on differentiation. Lastly, it is thank to strategies that farms seek to obtain a competitive advantage by valuing the typicality.

Referring to the body of literature about competitive advantage (Porter, 1987) we try to assess the value generation process across the supply chain of the "Terra di Bari" PDO olive oil in order to evaluate its effectiveness in using the PDO as a marketing lever. Building the supply chain, and trying to asses this diagnostic tool, we also provide a comprehensive picture of all the Italian Extra Virgin Olive Oil (EVOO) PDOs market, we present useful insights for a deeper knowledge of this market and to intervene on both the "Terra di Bari" supply chain's organization and strategy. The second paragraph describes the actual olive oil market; the third paragraph shows the “Terra di Bari” PDO EVOO’s supply chain and the value chain analysis for the two sampled firms. The last paragraphs present the results and concluding remarks.

2. The sample

The PDO market analysis was performed using IRI Infoscan[1] monthly data on extra-virgin olive oil (EVOO) sales (quantities and values) in Italian modern retailers, and ISMEA data. For this study we considered data from 2006; however, in some cases, we referred to different time frames. The case study supply chain and value chain analysis were performed using data from, respectively, the Chamber of Commerce of Bari (the certification body of “Terra di Bari” PDO olive oil) and direct interviews to two representative firms.

2.1 The olive oil market and the EVOO PDOs

The olive oil market is actually living a deep crisis whose most direct effect is a striking price fall: e.g. a kg of EVOO was quoted in April 2009 around 2.20 € (tab.1) in most of the primary Italian markets, and even around 1.70 € in some of the main Spanish market places. This crisis seems to interest the whole supply chain with the only exception of the distribution companies, and it can be addressed to several causes such as 1) a steep increase of standardized supply (given the rise of super intensive orchards around the world), 2) a unconstrained and fast price-cuts policy by the major distribution chains, and 3) the concurrent financial crisis that dismantled the system of credits upon which the supply chain was organized.

Table 1. Price at the origin of olive oils by type and by origin (Apr ’08 – Apr ’09)

Olive oil	Apr 08	May 08	Jun 08	Jul 08	Aug 08	Sep 08	Oct 08	Nov 08	Dec 08	Gen 09	Feb 09	Mar 09	Apr 09
Lamp Oil	2.20	2.08	2.07	2.10	2.11	2.10	2.02	1.96	1.78	1.69	1.72	1.62	1.54
Virgin Oil	2.45	2.37	2.31	2.38	2.38	2.38	2.25	2.25	1.99	1.92	1.95	1.86	1.77
EVOO	3.02	2.95	2.89	2.88	2.87	2.84	2.79	2.80	2.47	2.36	2.37	2.34	2.29
Foreign lamp oil	2.32	2.27	2.23	2.20	2.20	2.20	2.15	2.11	2.10	2.05	1.99	1.94	1.90
Foreign EVOOs	3.36	3.18	3.07	3.11	3.09	3.02	2.89	2.81	2.69	2.64	2.51	2.45	2.38
PDO/PGI (avg)	7.54	7.53	7.51	7.50	7.60	7.59	7.45	7.23	7.21	7.15	7.11	7.09	7.07

Source: ISMEA, 2009.

As opposed to the expanding supply, product differentiation based on higher quality and consumer’s expectations is one of the most powerful competitive strategies that EU farmers may adopt to face the crisis. Geographical indications established by the EU (PDO and PGI) can be successful marketing levers to ensure product differentiation based on high quality standards and geographical origin of production. In the last years (2005-2007) the turnover generated at farm level by the Italian olive oil PDOs shifted regularly between 60 and 64 millions of € while at the retail it gradually decreased from 63.30 to 54.28 millions of € (ISMEA, 2008) corresponding to lower consumptions (-3.9% in quantity and -0.6% in value). However, exports considerably rose since 2005, and some PDO labels specialized in the foreign market (tab.2) although often under private labels. At the same time, consumption of PDO olive oils from 2007 to 2008 globally raised both in quantity (+21.3%) and in value (+12%) (ISMEA, 2009), and three olive oil PDOs are included among the first 20 Italian PDO foods in terms of retail sales (tab. 3).

[1] IRI-Infoscan guarantees for the rapresentativeness of the sample of retail stores. Scannerized direct sales from the sampled stores (hypermarkets, supermarkets and Free Service Retailers with selling area above 100 m^2) cover the 70% of the whole national sales for the large scale comsumption.

Table 2. Italian exports of some* PDO/PGI olive oil from 2005 to 2007; quantities (ton) and values (mln €)

	Quantities			
	2005	2006	2007	Var. '07/06
EVOOs	170,998	250,621	279,473	11.5 %
Tot PDO and PGI	2,850	3,052	2,881	-5.6 %
(% of the total)	1.67	1.22	1.03	
	Values			
	2005	2006	2007	Var. '07/06
EVOOs	879	934	1,058	13.3 %
Tot PDO and PGI	15.04	30.5	29.0	-4.9 %
(% of the total)	1.71	3.27	2.74	

*Source: ISMEA; * the table reports data for only those products for which an official report exists.*

Table 3. Variations of household domestic consumption of the main PDOs/PGI olive oil from 2006 to 2008

PDO/PGI EVOO	Quantity		Value	
	Var. '07/06	Var. '08/07	Var. '07/06	Var. '08/07
Puglia*	8.6 %	26.0 %	9.2 %	1.0 %
Toscana*	-10.6 %	-9.2 %	6.6 %	-7.3 %
Riviera Ligure	-14.3 %	11.1 %	-18.8 %	23.2 %

*Source: Ismea/Nielsen; * different PDO and PGI olive oils, from Puglia and Toscana.*

2.2 The Italian market of EVOOs

National retail sales of EVOO in 2006 summed up to 597 million €. The largest share of this value belongs to undifferentiated EVOOs, while the "100% Italian" EVOOs covered the 12.7 %, and PDO/PGI olive oils covered the 3.36 % in value, a third of the turnover generated in the same year. Accordingly, volumes of retail sales are distributed as follows: 84.6 %, 13.35 % and 1.68 %, showing a higher per unit value for the PDO olive oils.

Table 4. Retail sales (values in € and quotas) of EVOOs by type of origin and geographic area in 2006

Area	100% Italian	PDO/PGI	Others	Tot (%)
North-West	16,646,105 (2.79 %)	8,736,163 (1.46 %)	164,209,810 (27.50 %)	31.80 %
North-East	21,231,666 (3.56 %)	7,506,824 (1.26 %)	142,710,535 (23.90 %)	28.70 %
Center & Sardinia	37,725,495 (6.32 %)	3,684,775 (.62 %)	193,779,993 (32.46 %)	39.40 %
South	153,897 (.03 %)	133,984 (.02 %)	535,772 (.09%)	0.14 %
Tot (%)	12.69 %	3.36 %	83.85 %	

Differentiating by geographic area the 39.4% of the national expenditure for EVOOs is concentrated in the Central Italy and Sardinia (almost 253 millions €; tab. 4). It follows the North-West (31.8 %, 189 millions €), the North-East (28.7 %, 171 millions €) and finally Southern Italy with just the 0.14 % (0.8 millions €). The most plausible reason for the Southern Italian share resides in different purchase habits: Southern Italians generally buy olive oil directly from the farmers, the mills or from other direct market channels. Preferences for proximity purchases, a traditional link with the olive oil sector (and broadly with agriculture), trust relationships with olive oil producers, and taste specificity are the explanations for this behavior that often is not price convenient neither corresponds to objective quality standards.

The largest retail consumers of PDO/PGI EVOOs are in North-Western Italy with a share of 43.5 % (tab. 5) while Southern Italy is again at the bottom of the scale, with a share next to zero (0.67 %).

Table 5. Retail sales (values in €) of PDO/PGI EVOOs by geographic area in 2006

Area	Sales value of PDO/PGI EVOOs (€)	%
North-West	8,736,163	43.55 %
North-East	7,506,824	37.42 %
Center & Sardinia	3,684,775	18.37 %
South	133,984	.67 %
Tot	20,061,746	100 %

Per capita average retail purchases of extra virgin olive oil in Italy was in 2006 about 2 lt for an average per capita expenditure of 10.16 € (tab. 6). The highest value is registered again in Central Italy (3.87 lt and 18 €, respectively) followed by the North-West. On average, in 2006 each Italian purchased 0.03 lt of PDO oils at the retail stores spending 34 cents of €. Comparing the per capita value of sales in June 2005 and June 2007 the "100% Italian" olive oils increased the most (+36%) followed by the PDOs oils (+22%) and the others olive oils (+16%).

Table 6. Italian per-capita retail purchases (lt.) and expenditure (€) for EVOOs by origin in 2006

	100% Italian		PDO/PGI		Others		Tot	
	Purchase (lt.)	Expend. (€)	Purchase (lt.)	Expend. (€)	Purchase (lt.)	Expend. (€)	Purchase (lt.)	Expend. (€)
North-West	.27	1.5	.07	.79	2.85	14.77	3.19	17.05
North-East	.26	1.37	.05	.48	1.81	9.18	2.12	11.02
Center&Sardinia	.68	2.91	.03	.28	3.16	14.93	3.87	18.12
South	.01	.01	.002	.01	.03	.03	.04	.04
Italy	.27	1.29	.03	.34	1.73	8.53	2.03	10.16

As showed in fig. 1, sale trends (in values) of PDO oils and undifferentiated EVOOs from June '05 to June '07 fully overlap with a maximum in December and peaks that seem to follow regular intervals of four months. On the other side, the "100% Italian" olive oils follow a different trend where it is possible to recognize a significant increase of sales only between October and December. The PDO EVOOs' retail consumption, therefore, is less seasonal, while purchases of "100% Italian" oils seem to behave like seasonal stock house hold provisions.

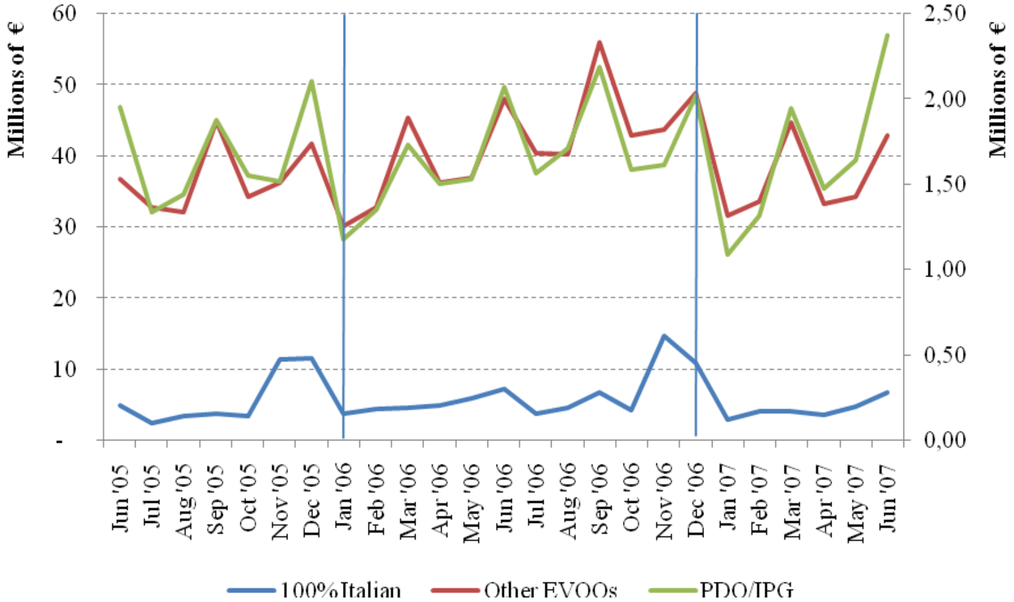

Figure 1. Trend of the EVOOs retail sales (values in €) from June 2005 to June 2007, by indication of origin (PDO/PGI olive oil sales refer to the secondary y-axe on the right side of the graph)

As for the retail prices (tab. 7), PDO olive oils registered an average price of 12.09 €, hence about the 30% higher than the price at the origin. Compared to the others olive oil categories here included the retail price of PDO oils was the +31% higher of the average retail price for olive oil, +37% higher than the 100% Italian, and +42% of the others oils. Geographically, olive oil prices are higher, on average, in Northern Italy and lower in the South as expected, and in the case of PDO oils' average prices are 12.98 € and 10.93 € respectively.

Table 7. Average retail prices and standard deviation by category and geographic area (year: 2006)

Area	100% Italian	Others	PDOs	Tot
North-East	8.41	8.42	12.07	9.06
s.dev.	3.54	6.15	4.30	5.73
North-West	9.49	8.76	12.98	9.70
s.dev.	8.14	5.74	12.32	7.97
Center & Sardinia	8.30	8.28	11.68	8.81
s.dev.	3.85	7.20	3.79	6.53
South	9.32	8.73	10.93	9.33
s.dev.	6.91	6.37	3.67	6.03
Italy	8.80	8.51	12.09	9.20
s.dev.	5.75	6.40	7.74	6.73

Table 8. Average prices at the origin for the main PDO&PGI EVOOs (€/Kg)

	Price at the origin					Retail price in 2006*
	2000	2006	2007	2008	Apr. '09	

Aprutino Pescarese	7.23	5.75	5.84	8.81	9.50	10.70
Chianti Classico	-	8.36	8.10	8.15	8.15	12.40
Cilento	4.33	-	-	-	-	10.40
Colline Salernitane	-	-	3.83	4.70	-	10.40
Dauno	-	4.25	4.04	3.67	2.98	8.90
Garda	8.82	13.50	11.56	11.25	11.25	14.90
Monti Iblei	-	3.99	3.77	5.75	6.50	10.40
Riviera Ligure	6.19	7.50	9.48	10.00	10.00	9.50
Sabina	-	5.91	6.19	6.71	6.10	10.40
Terra di Bari	-	4.05	3.53	3.32	2.45	8.90
Toscano	5.84	6.57	6.49	6.98	5.24	10.40
Umbria	6.44	7.42	7.48	7.63	7.40	14.70
Valli Trapanesi	-	4.10	3.74	4.04	3.65	10.40
Veneto	-	11.65	11.65	11.65	11.65	16.80
Average	**6.47**	**6.87**	**6.84**	**7.46**	**7.07**	

*Source: ISMEA (http://datima.ismea.it/datima/dindex.jsp); * average price for PDOs from that region.*

Focusing on price trends at the origin for PDO oils in the period from 2000 to 2008, the average price greatly varied with a substantial increase only in 2008 when it reached 7.46 €/Kg (tab. 8). Considering the single PDOs there are great differences in the price at the origin trends. In 2008 the lowest price is found among the "Terra di Bari" (3.32 €/Kg) and "Dauno" (3.67 €/Kg) while the highest has been recorded for the "Riviera Ligure" (10 €/Kg), "Garda" (11.25 €/Kg) and the PDOs from Veneto region (11.65 €/Kg). The "Toscano" was in an average position quoting around 6.98 €/Kg.

The market of PDO EVOOs in 2006 was leaded by the private labels that owned together the 36% of the retail market. Unfortunately the data does not specify the single private labels neither provide information about the origin of these EVOOs, affecting the results about market shares by origin. However, results are still really interesting especially if we consider that they represent performances of a diversified set of firms: cooperatives, large, medium and small firms. Excluding the private labels, market quotas are calculated as follows: Umbria (22.98%), Toscana (19.43%), Puglia (16.95%) e Liguria (14.75%). Regional sells have been aggregated to calculate market shares based on geographic area (North, Center and South; tab. 9). Retail sells of olive oils with a PDO or PGI from Central Italy are almost the double compared with the other aggregations, while Southern Italian oils are the last in the scale. Moreover, Southern Italian olive oils do not lead in any of the geographic aggregation except by the South of Italy.

Table 9. Cross tab distribution of market shares by area

Origin	North	Center & Sardinia	South	Tot
North	32.5 %	8.39 %	19.02 %	28.63 %
Center & Sardinia	40.05 %	76.81 %	21.37 %	45.58 %
South	27.45 %	14.79 %	59.61%	25.79%

Looking at retail prices, the PDOs with the largest average price in 2006 were those from Veneto (17.3 €) Lombardia (15.53 €) Emilia (13.79 €) and Liguria (13.39 €), while the lowest are foreign oils (6.3 €) and oils from Calabria (8.16 €), Basilicata (8.5 €) and Puglia (8.8 €). Basilicata and Calabria are also those with the largest coefficient of variation while labels from Umbria (2.56), Abruzzo (3.36), Sicilia (4.44), Liguria (4.91) and Toscana (5.18) are those whose prices are more uniformly distributed.

Fig. 2 represents all the PDOs as circles (included foreign labels and labels with more than one PDO) in a three dimension space were the x-axis represents the price level, the y-axis represents the market share, and the size of the circles is directly proportionate to the coefficient of variation in prices along the four geographic areas. This time market shares have been calculated excluding the private labels. In the up-right side of the graph we can find the most profitable PDOs: Umbria, Toscana and Liguria. They have a quite high price and very high market shares and, above all, they all have a similarly small coefficient of variation. In the left-up quadrant, we can find only Puglia, that with a quite uneven price policy (if any), owns a large market share (probably due to a large supply) but a relatively low price. In the bottom left quadrant there are all those labels that cannot be uniquely identified for a market strategy but can be grouped for being not profitable since they have a small market share and low prices (eg. Basilicata, Calabria, Campania). Finally, on the bottom right we find PDOs from Emilia-Romagna, Lombardia e Veneto: small market shares and high prices. Lombardia and Veneto have a very high average price and an equally high variation in the distribution of prices. This group could be labeled as niche markets, and results for Veneto and Lombardia seems to indicate a free rider behavior.

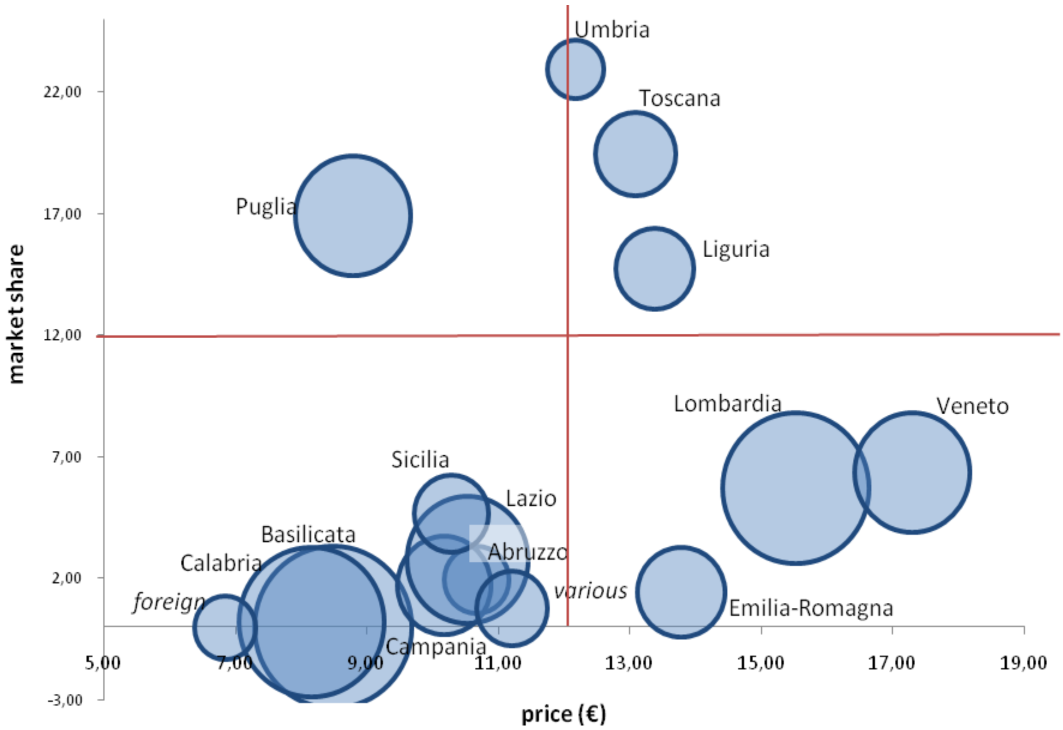

Figure 2. Positioning of PDOs by region, price, market share and price variation, in 2006

About the latter results it would be interesting to answer if different levels of price or market share homogeneity across the national market can be addressed to different organizations framework on the supply side. If positive, does homogeneity implies a deeper control of both the production levels and the marketing leverages? Is an organized supply framework desirable as opposed to a free-rider scenario, or is it better to leave the firms to self-organize and the market to do the rest?

Finally, we illustrate the ten biggest labels in the PDO market by market share in 2006 (tab. 10). All the companies here illustrated chose a packaging of 0.5lt and 0.75 lt bottle (with the only exception of the private labels and Farchioni that present a 1lt bottle), and together they represent the 62.6 % of the market. The private labels all together sum up, as noted above, to the largest share of the market (35.86%). The price policy is much differentiated from about 15 € for a 0.5lt bottle to 4.7 € for a 1lt bottle. Looking at the single companies they all show a quite homogeneous price policy among their different packaging. Monini is the leader with 5.63% market share (in 2006), an average price of about 13 €, three different PDOs. Sos Cuetara, a Spanish company, with the label Minerva holds the second place with a market share of 4.5%, and it is similar to Monini with a price about 13 € and 3 PDOs. At the third place Farchioni (4.08%), a group from central Italy, that presents a variety of PDOs and lower prices. At the Fourth place we find Sos Cuetara again, this time with the Carapelli label, a 2.47 % market share, several DOs and the Toscana PGI, and an average price of 12 €. Summing up, the Sos Cuetara group was leading holding the 6.95% of the Italian PDO market in 2006. At the fifth, sixth and eighth places we finally find four labels from Puglia that belongs to Agri Desantis, Olearia Desantis and Olearia Clemente, holding a share of about 2% each and summing up to 6.19%. Together they represent the 57% of the PDOs from Puglia. Their prices range from 8.4 € to 6.9 € and they sell only 0.75 lt bottles. Finally, it is important to remark that the groups Agri Desantis and Olearia Desantis own other PDO labels that bring them to sum up to 5.1% of the PDO market.

Table 10. First ten PDO/PGI labels by retail market share in 2006

Property	label	n. of references	Packaging (lt) and price	Market share	PDO/PGI
Private Label	various	-	.5 lt / 14.8 € .75 lt / 10.3 € 1 lt / 4.7 €	35.86%	Several
Monini	Monini	3	.5 lt / 13.6 € 75 lt / 13.3 €	5.63%	Umbria, Puglia, Sicilia
Sos Cuetara (Spain)	Minerva	3	.75 lt / 13.3 €	4.48%	Toscana, Liguria, Puglia
Farchioni	Farchioni	7	1 lt / 11.6 € .75 lt / 9.2 €	4.08%	Several
Sos Cuetara (Spain)	Carapelli	2	.75 lt / 12.3 €	2.47%	Several + 1 PGI Toscana
Agri Desantis	Agri Desantis	1	.75 lt / 8.4 €	2.18%	Puglia
Olearia De Santis	Terra di Bari	1	.75 lt / 6.9 €	2.12%	Puglia
Ind. Ali. Montalbano	-	1	.5 lt / 13.5 € .75 lt –/11.8 €	2.03%	Umbria
Olearia Clemente	-	2 (3 in 2007)	.75 lt / 7.8 €	1.89%	Puglia
Frantoio Ol. Bartolini	-	2	.75 lt / 10.5 €	1.85%	Umbria
Tot.	-	22		62.6%	

3. The case study: the “Terra di Bari” PDO olive oil

3.1 Background

Puglia is one of the Italian regions mostly characterized by the presence of olive: 308 thousand hectares, 41 million olive trees, 225 thousand of olive growing farms. The regional olive oil production amounts to 187,000 tons, the 45% of the national production thus leading the Italian scenario (AGEA, 2009). Between 1996 and 2004 Puglia was recognized with 5 olive oil PDOs: Dauno, Terra di Bari, Collina di Brindisi, Terra d'Otranto, Terre Tarantine. The “Terra di Bari” PDO (registered in 1997 by the EU Reg. n. 2325/97), second only to the PGI Toscano, is the most important both by quantities, by turnovers at the origin (tab. 11) and by potential production. The area of productions is the province of Bari, the most relevant olive area in Puglia. It sums 96 thousands firms, 111,000 ha of UAA and more than 16 millions of olive trees. The production is esteemed to be 410 thousand tons of olives and 70 thousand tons of olive oil (AGEA, 2008).

Table 11. Production, turnover at the origin, turnover at the domestic consumption and average prices of the 4 main Italian by certified quantities

PDOs	Certified production *		Turnover at the origin**		Average price at the origin***	
	2006	2007	2006	2007	2006	2007
PGI Toscano	3,352	2,749	36.3	33.1	10.83	12.04
Terra di Bari	1,250	1,361	4.6	4.3	3.68	3.16
Garda	228	225	3.1	2.6	13.6	11.56
Riviera Ligure	370	459	3.6	4.5	9.73	9.80
Sub-total	*5,200*	*4,794*	*47.6*	*44.5*	*9.15*	*9.28*
National total	7,782	7,237	64.7	60.5	8.31	8.36

Source: ISMEA, 2008; *: tons; **: millions of €; *** €/Kg.

The market of the “Terra di Bari” PDO EVOO summed up to 1,250 tons in 2006/2007. Turnover at the domestic consumption was over 8 million € with a market share up to 15 % of the national PDO market (tab. 12).

Table 12. Turnover at the domestic consumption of the main PDOs (values in millions of €)

	Turnover at the domestic consumption					
	2005		2006		2007	
PDO	million €	%	million €	%	million €	%
Toscano	16.8	26.7	12.2	21.3	9.1	16.8
Terra di Bari	6.2	9.8	7.6	13.2	8.2	15.1
Garda	5.0	7.9	5.6	9.8	5.5	10.1
Riviera Ligure	4.6	7.3	3.8	6.6	4.8	8.8
Sub-total	*32.6*	51.7	*29.2*	*50.9*	*27.6*	50.8
Total	63.0	100.0	57.4	100.0	54.3	100.0

Source: ISMEA, 2008.

In 2006 sales of “Terra di Bari” PDO own-brand labels in modern retailers were the 24% in volume corresponding to 2.5 million €, for an average implicit price of 7.74 €/lt., remarkably lower than the average implicit price of the whole PDOs’ market (9.97 €/lt., our estimation using Iri-Infoscan data). Part of the “Terra di Bari” sold in the Italian modern retailers is still unknown since it is sold as private label. Another missing share of the Italian market is the direct selling.

Export is a relevant market channel for the “Terra di Bari” PDO EVOO. Although there are not official data, our research with the stakeholders of the supply chain confirmed that foreign markets matter and revealed that export were partially responsible of the increasing sells of the last years. The main foreign market is Germany and precisely two large retail chains, Lidl and Aldi, whose sells the “Terra di Bari” PDO in the Middle-Northern Europe.

3.2 The “Terra di Bari” PDO supply chain

The whole province of Bari is eligible for the “Terra di Bari” PDO but only 625 firms adhered for 5,735 ha and 976 thousands trees. The effective producing area is smaller considering that only a share of the production of the certified firms is finally sold as PDO (44% for the season 2007/2008).

The production area, as provided by the PDO production regulation, is divided in 3 sub-areas each owning a different geographic mention: “Castel del Monte” (CdM from now on), “Bitonto” (BIT) and “Murgia dei Trulli e delle Grotte” (MTG) (fig. 2). The three sub-areas differ by the type of olives cultivated: Coratina (minimum 80%), Coratina and/or Cima di Bitonto (minimum 80%, each or in blend), Cima di Mola (minimum 50%).

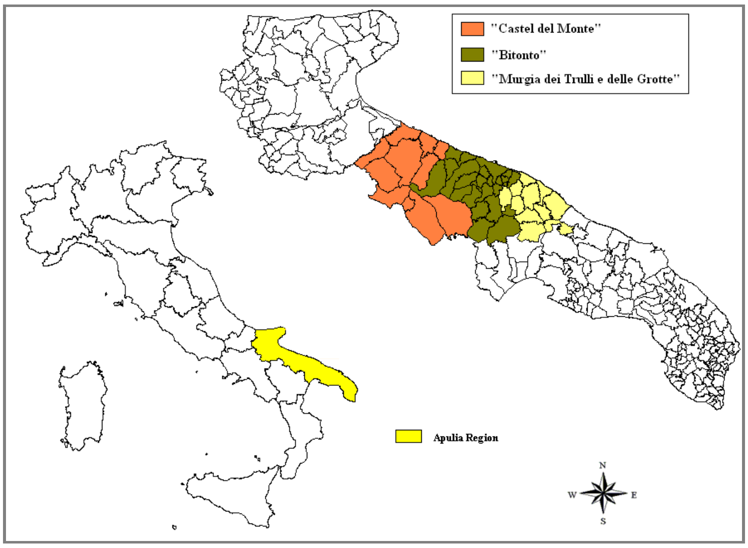

Figure 3. “Terra di Bari” area and its 3 sub-areas

Producers who adhere to the PDO protocol are controlled by the Commerce, Crafts and Agriculture Chamber of Bari (CCIAA), a public institution authorized by the Italian Ministry for Agriculture (MiPAAF). Furthermore, the Consortium for the “Terra di Bari” PDO is part of the supply chain. Established in 2000 and recognized by the MiPAAF only in 2009 because the number of farmers was too low, it values and preserves the interests of the PDO and it works with stakeholders both within the supply chain and external. The Consortium actually counts 247 firms of the 687 certified, made up of 170 farmers, 7 first cooperatives (representing 171 farmers), 29 mills, 41 packaging firms. The Consortium is also sponsored by the Province of Bari, the Regional Government, the Chamber of Commerce of Bari, a private bank, and several Municipalities.

The different typologies of firms constituting the “Terra di Bari” PDO supply chain (farmers, mills, packers and brokers) and the different levels of vertical integration make the structure of the supply chain quite complex. The number of certified firms recently grew (tab. 13) mainly among farmers. In the last season (2008/2009), for example, the number of operators grew from 579 to 687. The growth in the number of firms brought to a larger harvest, and the quantity of certified olives rose from about 6 thousand tons in 2003/2004 to 18,000 tons in 2007/2008.

Table 13. Certified firms and operators in the “Terra di Bari” PDO supply chain

Harvesting season	Farmers	Mills	Packers	Brokers	Total
2003/2004	257	34	38	1	330
2004/2005	330	40	40	1	411
2005/2006	392	41	51	1	485

2006/2007	432	39	49	1	521
2007/2008	484	43	51	1	579

Note: firms are classified by the main activity.

Available data allows classifying firms in two kinds: specialized firms and vertically integrated firms (tab. 14). Considering the small dimension for the supply chain the number of processing firms is quite high as well as for the number of vertically integrated firms.

Table 14. The supply chain: a detailed picture for the season 2008/2009

Type of firm	Number of firms	
Specialized firms	634	
– *farmers*		*599*
– *mills*		*13*
– *cooperative mills*		*9*
– *packers*		*12*
– *brokers*		*1*
Vertically integrated firms	53	
– *farmers with a mill*		*4*
– *farmers with a packaging line*		*17*
– *brokers with a packaging line*		*2*
– *farmers with a mill and a packaging line*		*5*
– *mills with a packaging line*		*16*
– *cooperative mills with a packaging line*		*9*
Total	687	

Source: CCIAA of Bari.

A structural characteristic of PDO farmers is that the average cultivated area is larger than conventional farmers: 9 ha as opposed to 1.15 ha. For the specialized farmers the average area is 8 ha, but they sum up to the 88% of the whole PDO area (tab. 15).

Table 15. Olive farmers, areas and number of trees (2008/2009)

Type of firm	Firms		Area		Average area (ha)
	n.	%	Ha	%	
Farmers	599	95.8	5,057	88.2	8.44
Farmers with a mill	4	0.6	78	1.4	19.42
Farmers with a packaging line	17	2.7	369	6.4	21.72
Farmers with a mill and a packaging line	5	0.8	231	4.0	46.10
Total	625	100.0	5,735	100.0	9.18

Source: CCIAA of Bari.

The largest sub areas are the CdM and the BIT, while the MTG sub-area counts only one firm (tab. 16).

Table 16. Olive orchards by sub-area

	firms		area		Average area (ha)
Sub-area	n.	%	Ha	%	
Castel del Monte	233	37.3	3,172	55.3	13.61

Bitonto	384	61.4	2,393	41.7	6.23
Murgia dei Trulli e delle Grotte	1	0.2	4	0.1	3.94
Castel del Monte-Bitonto*	7	1.1	166	2.9	23.77
Total	625	100	5,735	100	9.18

*Source: CCIAA of Bari; * it refers to those firms with olive orchards in both the sub-areas.*

The low number of firms in the MTG sub-area can be addressed to some constraints imposed by the PDO protocol. With years the Coratina cultivar substituted the Cima di Mola so that it not possible to reach the minimum threshold of 50% the area cultivated with the Cima di Mola. For all three sub-areas the large plant spacing and the maximum production threshold imposed by the protocol are not suitable with the intensive olive orchards. These constraints are as much physical as economical, since it makes not convenient to produce PDO olives and olive oil: not counting the certification costs, the per-unit costs are higher and the yield is lower. Recently the plant density constraint has been removed, and the modern farms will probably shift to the PDO certification.

Stepping to the first transformation phase we observe two coordination strategies: 1) olives are sold by specialized farmers to cooperative or private mills to be processed in to oil; 2) olives are processed within the vertical integrated farmers owing a mill. Farmers not vertically integrated decide to certificate their olives' production whether or not the expected premium price at the harvest for the PDO olives cover at least certification costs, or because of informal agreement with mills that accept to pay for the certification costs. Some farmers own a packaging line so that they pay a mill to process the olives and then they bottle it privately. Others are completely vertically integrated, so that they can process and bottle their own oil. By the PDO Production Regulation the olives have to be processed within the sub-area, not later than 2 days from the harvest, and only by mechanical and physical methods. The PDO supply chain counts 56 mills (38 private, 18 cooperative) mainly in the CdM sub-area (30) and the BIT sub-area(24); only 2 are located MTG.

The first processing firms collect the certified harvest, generally by informal agreements with farmers, and then they sell the olive oil in bulk to traders and packaging firms. Among the 56 mills 21 have a packaging line. All the cooperative mills included those who could bottle the end-product (9) sell in bulk.

In the last harvesting seasons the PDO EVOO sold in bulk more than tripled reaching the 3.3 thousand tons (tab. 17).

From 2002 to 2006 the "Terra di Bari" bulk quotations rose from 3.1 €/Kg to 4.05 €/Kg corresponding to a premium price, calculated respect to the conventional EVOO, ranging from 10 % to 15 %. On the other side, compared to the other Italian DOs the "Terra di Bari" price is lower by the 39% to the 55% on average.

The olive oil produced is sold in bulk and later is packed by firms specialized in packaging activity. Differently by the first processing phase, the packaging can be placed in the entire DO area, regardless the DO sub-area mention. The packaging certified firms are 61 all located in the CdM sub-area; 12 of them are specialized, 49 vertically integrated, and 30 of these latter own a mill.

The share of packed PDO olive oil, although still small rose from 21.7% in 2003/2004 to 54.3% in 2005/2006, but in the last two seasons it slightly lowered (tab. 17). The remaining share of certified bulk olive oil is sold as conventional due to low quality or "market" reasons.

Table 17. Trends for "Terra di Bari" PDO EVOO in bulk and packed (volumes)

Season	Bulk oil (tons)	Packed oil (tons)	Packed oil / Bulk oil (%)
2003/2004	1,140	247	21.7
2004/2005	1,746	942	54.0
2005/2006	1,911	1,037	54.3
2006/2007	2,327	1,250	53.7
2007/2008	3,377	1,361	40.3

3.3 Chain value analysis of firm's strategies within supply chain

The ongoing analysis showed as there are two main kinds of organizations within the "Terra di Bari" PDO supply chain: specialized firms and vertically integrated firms that internalize one or more production stages. In both cases the packaging stage is centric within the value generation process and in the value distribution along the supply chain. To evaluate the competitive strategies of firms that pack olive oil would lead to a deeper knowledge about the ability of the PDO label to generate value and its distribution.

The value chain model introduced by Porter in 1987, allows to reach this goal by designing a firm' structure as a set of processes or activities. Doing so it allows to distinguish two main categories that generate the value: value generating activities and the margin. The former area includes those physical and technological activities directly implemented by the firm. The latter is the difference between value and costs paid for the value generation activities. These are in turn divided in two typologies, primary and support activities. The primary activities are those used to create the product, to sell it and for the logistic. The support activities sustain the primary activities by providing production inputs, technologies, human resources, and other functions. The infrastructural activities, on the other side, are not included in any primary activity, but support the whole structure of the production process /supply chain. A fundamental stage of the value chain analysis consists in identifying the value generation activities and in observing their interaction / organization so to discover where the value is created. We focus here on how these activities generate value and what generate costs (tab. 18).

Value is used instead of costs to detect a firm's competitive position since firms generally increase deliberately costs to obtain a higher price through differentiation, as it happens for PDO olive oils.

A firm's value chain is embedded in a larger flow of activities, the so called value system. This system is made up of the value chains of all the firms of the supply chain (eg. producers, providers, distributors) and of the clients as well. Finally, the strategic costs analysis is necessary to define the firm's competitive advantage (cost leadership, differentiation, both).

Table 18. Activities and costs for the value chain of PDO EVOO

Primary activities	Support activities	Infrastructural activities
Operative activities	Procurement	Administration - Direction - Planning
Upkeep	Depreciation	
Energy	PDO olive oil	
Labor	Bottles	
Outbound logistic	Crew and seal	
Stocking costs	Labels	
Transportation costs	Packaging	
Marketing and sales	Technology development	
Advertising	R&D	
Promotion	Certification	
Brokerage	Insurance	
	Quality control	

We build here the value chain of the two representative firms of the supply chain for the packaging stage: a specialized packaging firm and a vertically integrated firm. Data were collected by direct interviews.

The first firm represents the final stage of a chain of firms coordinated through the market. Its main business activities are stocking and packaging. The price paid to buy the olive oil bought in bulk from cooperative and private mills varies from year to year and it costs 8-10% more than the conventional olive oil.

The firm works both with bulk and packed PDO EVOO and its strategy focused towards serving the *private labels* of German market. The value chain is therefore built for this specific kind of product and market channel, even if this firm also sells directly o the national market.

The second firm produces fully vertically integrated. It produces olives, it processes them and it finally bottles the oil. The firm, in fact, owns 40 ha of certified olive orchards, a mill and a packaging line. Moreover, the firm buys PDO olives from other farms, and it produces also conventional and organic olive oil. Also this firm sells the largest share (70%) in bulk. The bottled PDO oil is sold with own label (33%) and for other industrial labels (67%). Both the firms belong to the CdM sub-area, thus producing the same PDO EVOO.

By comparing the two value chains the two firms differ by the costs- structure of both the primary and the support activities, by the final price of the product, by the margins, and by the distribution-s margin (tab. 19 and tab. 20).

Table 19. The value chains for the two sampled firms of "Terra di Bari" PDO (values calculated referring to 2007/2008)

	Specialized firm		Vertically integrated firm	
	€/Kg	%	€/Kg	%
PRIMARY ACTIVITIES:	0.2619	6.65	0.5400	11.62
Operative activities	**0.0729**	**1.85**	**0.2650**	**5.70**
Upkeep	0.0029	0.07	0.0150	0.32
Energy	0.0500	1.27	0.0300	0.65
Labor	0.0200	0.51	0.2200	4.74
Outbound logistic	**0.0190**	**0.48**	**0.2000**	**4.30**
Stocking costs	0.0060	0.15	0.0200	0.43
Transportation costs	0.0130	0.33	0.1800	3.87
Marketing and sells	**0.1700**	**4.31**	**0.0750**	**1.61**
Advertising	0.0010	0.03	0.0510	1.10
Promotion	0.0010	0.03	0.0240	0.52
Brokerage	0.1680	4.26	0.0000	0.00
SUPPORT ACTIVITIES:	3.6794	93.35	4.1058	88.38
Supply	**3.6304**	**92.11**	**3.8458**	**82.78**
Upkeep	0.0100	0.25	0.0030	0.06
PDO oil*	3.1144	79.02	2.7880	60.01
Bottle	0.3000	7.61	0.3600	7.75
Crew and seal	0.0400	1.01	0.0456	0.98
Labels	0.0300	0.76	0.0720	1.55
Packaging	0.0500	1.27	0.1200	2.58
Other costs*	0.0860	2.18	0.0468	1.01
Development and tech.	**0.0430**	**1.09**	**0.1600**	**3.44**
R&D	0.0070	0.18	0.0100	0.22
Certification costs	0.0120	0.30	0.1300	2.80
Insurance	0.0010	0.03	0.0000	0.00
Quality control	0.0230	0.58	0.0200	0.43
Infrastructural activities	**0.0060**	**0.15**	**0.1000**	**2.15**
Adm. - Direction – Planning.	0.0060	0.15	0.1000	2.15
Total costs	**3.9413**	**100**	**4.6458**	**100**

** For the PDO EVOO costs we used the market price for the specialized firm and the production costs for the vertical integrated firm.*

The incidence of costs for the primary activities is higher for the integrated firm, due mainly to the operational activities (especially labor costs) and the outgoing logistic. On the other side, the specialized firm presents a cost advantage on the marketing and sells side.

Among the support activities the PDO supply (in bulk) is the "heaviest" support activity for both the firms. While the specialized firm buys olive oil on the market (per unit cost 3.11 €/Kg), for the integrated firm olive oil is an internal cost remarkably lower (2.78 €/Kg). In absolute values the support activities costs are higher for the integrated firm. Excluding costs for olive oil, in fact, all the single support activities costs are lower in the specialized firm.

Differences among the two entrepreneurial strategies emerge also considering the end-product prices and margins (tab. 20). The integrated firm has a more efficient differentiation strategy, as the higher selling price and margins show.

The distribution margins, instead, are higher than the firm's margin in both cases but more for the most differentiated product.

Table 20. Costs and margin at both firm and distribution level

	Specialized firm		Integrated firm	
	€/Kg	%	€/Kg	%
Total costs	3.9413	63.06	4.6458	35.74
Firm margin	0.2587	4.14	2.5542	19.65
Firm price	4.2000	67.20	7.2000	55.38
Distribution margin*	2.0500	32.80	5.8000	44.62
Retail price	6.2500	100.00	13.0000	100.00

** Distribution margins are calculated as the difference between the retail price and the firm price, assuming the distribution costs being equal to zero.*

4. Concluding remarks

The analysis allowed to evaluate and investigate the market placement of the "Terra di Bari" PDO among the Italian PDO EVOOs. The supply chain analysis showed the structure and the organization of the production. Results from the value chain analysis of two representative firms shed a light on the value generation process and value distribution among the different kind of firms.

The retail market analysis showed that the PDO niche market is dominated by the private labels and some few labels. Most of them belong to big industrial groups both Italian and Spanish; among the first ten labels by market share, four are from Puglia, three of them are "Terra di Bari" PDOs. The PDO labels, grouped by region, show different market policies. PDOs from Puglia bet on large quantities and fair prices, with a quite large variation in prices. The "Terra di Bari" PDO EVOO is mostly sold in the foreign market by modern retailers under private labels and in the domestic large retail chains under both own-brand labels and private labels.

As for the ability to generate value, the "Terra di Bari" label behaves differently depending on the firm typology and the structure of the supply chain. For the market driven configuration the value is quite low and it belongs to those firms that bottle olive oil and to retailers. The vertically integrated firms that include both the olive production and the first and/or second transformation stage are able to generate a higher value and margin. These firms represent a small share of the firm population. Most of the firms, in fact, belong to the agricultural stage of the supply chain (olive orchards) and the benefits they earn by the PDO certification are quite small: although the PDO product is better marketable than the undifferentiated product, the *premium price* for the PDO olives is just slightly higher than the undifferentiated product. As for the mills, if specialized, they generate a lower value compared to the firms in the next stages of the supply chain (bottling firms, distributors).

The results seem to suggest that for a more equal value distribution along the supply chain it could be possible to intervene on the supply chain organization. Farmers, in fact, did not benefit of the demand expansion in the last year for the “Terra di Bari” PDO EVOOs. Only the last stages of the supply chain were able to compete acquiring larger shares of value and margins. Among the possible interventions, for example, it could be necessary to invest in improving horizontal and vertical coordination strategies for controlling excess supply and coordinate marketing strategies. Another possibility could be to enhance the “Terra di Bari” PDO Consortium in its institutional activities and, above all, investing in promotion and advising. There is also the need to find new market opportunities to develop own-brand strategies, investing in marketing, product valorization and placement. Investing in promoting the realization of short supply chain schemes could be another feasible intervention.

Finally further researches should try to assess mechanisms to provide farmers with a larger share of value.

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