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Vertical Coordination in Organic Food Chains: A Survey Based Analysis in France, Italy and Spain

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Abstract: The paper analyses characteristics of vertical relationships of organic supply chains with a specific focus on the processing and retailing sectors. The analysis takes into account different regions of the EU Mediterranean area. Data were collected through interviews using an ad hoc questionnaire. The survey was based on a sample of 306 firms, including processors and retailers. The analysis revealed that a relevant aspect for the processing firms of organic products concerns the guaranteeing of safety and quality levels for the products. The main tools to implement the quality management are based on the adoption of specific production regulations and quality controls. The premium price most frequently applied by processors ranges from 10% to 40% and similar values are revealed for retailers. The diffusion of supply contracts allows the vertical coordination between agriculture and processing firms in the organic supply chains. The main distribution channels for the processing firms are represented by specialised shops in organic products, direct sales and supermarkets.

Keywords: organic food supply chains; vertical coordination; survey; EU countries

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1. Introduction

In the last few decades, consumers have showed an increasing awareness that a healthy diet can contribute to decreasing the risk of some diet-related diseases (for example, obesity and cardiovascular diseases), and consumers are more concerned about nutrition and health-related characteristics of food products [1–4]. Moreover, among consumers, there is growing concern about the link between health and environmental sustainability [5,6]. This has resulted in greater interest towards health-related attributes and sustainable aspects of food choices. The organic production meets these two requirements. This could partially explain the increased production and consumption of organic food. Indeed, previous evidence has suggested that these products are perceived by consumers as having higher nutritional value in comparison to conventional food: in this case, health represents the main motivator for organic consumption [7–16]. Besides health, environmental issues are the other important concerns that motivate consumers in choosing organic food [17,18]. According to the latest data provided by the Research Institute of Organic Agriculture (FiBL) and the Agricultural Market Information Company (AMI) in association with the International Federation of Organic Agriculture Movements (IFOAM EU), in 2014, European consumers spent about 23.9 billion euros for organic food [19].

As for organic production, following Eurostat data, in 2014, 10.3 million hectares were occupied with organic cultivation in EU 28 with an increase of 2.3% compared to 2013. In 2014, the incidence of the organic area on the total utilised agricultural area (UAA) was 5.9% [20]. In the last decade, the organic area increased by 500,000 hectares per year [20]. The economic literature's variety of evidence focused on consumers' attitudes towards organic food and consumers' willingness to pay for these products [21]. Although many empirical economic analyses have been carried out on consumer behaviour, only scant attention has been paid to the processing and retailing sectors within the organic supply chain [8–15].

The present paper analyses the characteristics of organic food processing and the relationships with agriculture production and retailers in six EU Nuts II regions: Lombardy and Tuscany in Italy, Rhone-Alpes and Paca in France, and Catalunya and Murcia in Spain. The choice of these regions and countries is due to the fact that the analysis is linked to a European project (Interreg) concerning cohesion among Mediterranean countries.

In 2014, the production phase represented the main activity in the organic sector (257,000 organic producers), accounting for over 80% of the organic operators in the EU-28. Albeit the production of organic crops and animal husbandry are the main activities in the organic sector, the processing of goods is also quite important (about 38,000 organic processors). According to Eurostat terminology, an organic processor is defined as "any natural or legal person who preserves and/or processes organic agricultural product (including slaughter and butchering of livestock). Packaging and labelling of organic products are also considered to be processing" [20].

The purpose of the paper is to analyse, in the processing sector, the capability of organic firms to perform a quality management strategy and to assess the degree of vertical coordination in the supply chains, highlighting the main characteristics of the relationships among agriculture, processors and retailers. Data were collected through an ad hoc questionnaire. The main results show that important issues related to the organic products are food safety and food quality and the need to find instruments able to guarantee these attributes to consumers. Indeed, the quality of organic production represents the value added of the sector, and consumers' willingness to pay for organic products is mainly linked to quality and safety attributes. Moreover, the degree of vertical coordination between processing firms and agriculture appears higher than the same relationships in the conventional chains.

The paper is organised as follows: the economic issues of organic quality and safety are examined in Section 2; the survey conducted and the methodology applied are examined in Section 3; the results are analysed in Section 4 and the concluding remarks are described in Section 5.

2. Economic Issues of Organic Food Quality and Safety

The EU political framework for organic products has demonstrated relevant changes over the last decades, with health and quality attributes placed side by side with environmental issues. In 2004, the first European Action Plan for Organic Food and Farming was proposed with the aim to promote and reinforce the organic sector [22]. All the actions expected were achieved, including the creation of a new EU logo of organic production.

After the first European Action Plan, the second Action Plan was launched in March 2014. This second Plan represents the main reference of EU strategy for organic production, controls and trade. Three are the priority fields on which the Action Plan will focus until 2020: (*i*) increasing competitiveness of EU organic producers; (*ii*) increasing consumers' confidence in the European scheme for organic food and farming as well as trust in the imported organic products and trust in control measures, and (*iii*) reinforcing the EU organic production scheme [23].

As mentioned before, the most important reasons to use organic products are human health and environmental sustainability (in terms of food safety, agricultural practices, pesticide free, and animal welfare) [24–28]. On the contrary, the main barrier to the use of such products is connected to the problem of trust. Indeed, consumers are not able to verify if a product is actually produced following the organic scheme or not [29–32]. In the economic literature, the organic attributes, are typically considered credence, as consumers are not able to verify these attributes even after consumption [33–35].

The lack of information combined with the high price of the products and high production costs represent the main constraints for the sector development [36,37]. In order to increase the transparency and communication along the supply chain and reduce the information asymmetry in the market, a strong collaboration among chain agents is required. In this context, competitive strategies based on quality management that could involve vertical relationships, introducing contracts, agreements and other instruments of vertical coordination should be recommended. Indeed, a more coordinated supply chain can favour an increased availability of information about chain agents and about products, increasing the level of agents' responsibility. A higher degree of vertical coordination introduces more complex relations among chain agents and increases the level of interdependence among them. The firms operating in the same supply chain are linked in a more integrated way and the 'bilateral dependency' of the agents grows [38–41]. The analysis focuses on the strategies adopted by the interviewed firms with respect to quality and safety requirements and premium price achieved, analysing the relations between processors and producers and between processors and retailers within the organic chains.

3. Methodological and Empirical Issues

Data were collected by firms' interviews active in organic production, processing and retailing in six Mediterranean regions. The analysis is based on an ad hoc questionnaire with closed questions (Likert scale or dummy variables) and open answers. The presence of open answers helped to better contextualise the interpretation of some responses [42]. The questionnaire was organized in different sections on the basis of the purpose of the paper: (*i*) production features and quality management; (*ii*) raw materials supply and vertical coordination with agriculture; and (*iii*) distribution channels. Moreover, an opening section aims at collecting general information about the firms in order to describe the sample. The sample was composed by 306 firms belonging to the six regions involved in the study. Each region was represented by approximately 50 units. The sample size was selected choosing a level of relative error (around 6%), taking into account the population size (around 7000 firms including both processing and retailing of all regions involved in the project) [43]. For the selection of the firms to be interviewed, we start from the list of the organic firms certified in each region. The selection was based on two criteria: the geographical distribution of the firms within the region and the representativeness of different sectors. Then, a request to participate in the survey was sent to each firm, obtaining a final sample of around 50 firms per region including processors and retailers. Specifically, in order to study the processing firms, and at the same time the vertical coordination with the retailing sector, the sample selected was composed of 67% of processing firms, and the remaining 33% was composed of retailers. Concerning the retailers, 92% are shops specialized in organic products while 8% are modern grocery retailers (supermarkets and hypermarkets). Table 1 reports the sampling scheme.

Table 1. Number of processing and retailer firms in the sample.

Regions	Processor	Retailers
Lombardy	38	12
Tuscany	37	15
Rhone-Alpes	37	16
Paca	26	25
Catalunya	29	22
Murcia	39	10
Total	**206**	**100**

It is important to underline that the division between the processing and distribution activities is often not so clear in organic supply chains; consequently, the sample of processing firms is comprised of a variety of activities including production, processing and distribution all within the same firm. With regard to processing firms, 83% of the total sample belongs to the food sector, and the others are firms that process aromatic and medicinal organic plants.

Despite the objective of making the regional samples as homogenous as possible from the quantitative and qualitative point of view, the different nature of the activities, and sometimes, refusal to answer the questionnaire, produced some divergences among the six considered sub-samples:

- in Lombardy, following the existing structure, consideration was given to firms producing bread, dairy products, pasta, fruit and vegetables, meat, olive oil, wine and so on, the first three sectors representing more than 50% of the total;
- the data relative to Tuscany displays a high quota of farms devoted to agritourism, integrating the various phases from production to distribution; the organic products more important in this region are oils, honey and jams, alcoholic drinks, bread and pastry;
- the Rhone-Alpes region is characterized by the presence of about 33% of activities linked to aromatic and medicinal organic plants;
- in the sample of the Paca region (Provence-Alpes-Côte d'Azur), there is an equal number of processing and retailing firms; all different branches of production are represented;
- the region of Catalunya is characterized mainly by animal production such as meat, dairy products, eggs and honey;
- in Murcia, the majority of the companies belong to the fruit and vegetables sector, and approximately 75% of them include different activities at the same time.

4. Results

4.1. Organic Processing Sector: Quality Strategy, Price and Distribution Channels

In line with the economic literature that underlines the importance of trust in the organic food market, a relevant issue that emerges from the survey concerns the guarantee of safety and quality levels of organic products. Indeed, a guarantee is an essential feature in order to comply with consumer requirements relative to organic food and to ensure premium price.

The 54% of the firms in the six regions have adopted more restrictive production standards than those set out in the EU general regulations for organic production (Figure 1). In addition, 90% of the firms state that they carry out quality controls, either through their own internal laboratories or by availing themselves of external services. However, the diffusion of the ISO 9000 certification still appears limited, and has been adopted by only 31% of the companies.

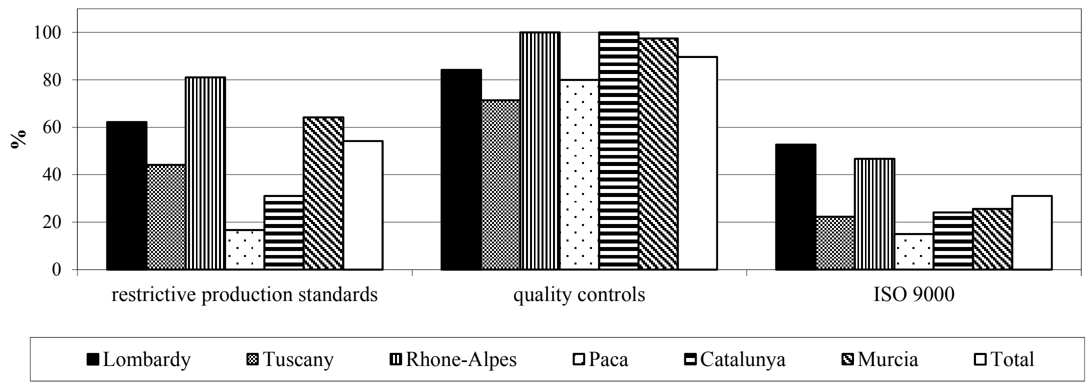

Figure 1. Use of quality standard certifications in the processing firms (% of sample of processing firms).

In terms of individual regions, production regulations are particularly widespread in Lombardy, Rhone-Alpes, and Murcia, whereas in Paca and in Catalunya, these quality instruments are implemented by a lower number of sample firms. Quality controls are widespread throughout the six regions. Moreover, the two regions in which a significant number of firms have adopted ISO certification are Lombardy and Rhone-Alpes.

In this context, the case of Lombardy is interesting; here, the interviewed firms underline the importance of quality controls for organic products, and 62% of them state that the existing controls are adequate. The role of the controls can be connected to the fact that possible scandals in the organic sector can seriously compromise the image of organic products for the consumer, and can therefore have a negative effect on firm profitability. In this sense, the quality standard certifications can be used by the processing firms as a tool to guarantee quality and safety attributes to consumers.

The use of certification could contribute to justification of the premium price of organic products with respect to conventional ones. Generally, premium prices of organic food products are due to: the higher production costs; limited organic supply compared to the demand; higher costs of post-harvest; and higher costs for marketing and distribution because of relatively small volumes. In the analysis, we refer to global premium prices for sold products as processed by the firms (including premium for raw materials). As shown in Table 2, for 10% of the firms, prices are increased more than 40%, for 37%, the premium-price lies between 20% and 40%, while for 36% of the firms, the price increase ranges from 10% to 20%. On the other hand, for 17% of the firms, no increase in prices is practised.

Table 2. Average premium price of organic products *vs.* conventional products for processing firms.

Regions	None	10%–20%	20%–40%	40%–80%	More Than 100%	Total	Sub Total	No Answer	Total
				%				n. firms	
Lombardy	32.4	41.2	20.6	5.9	0.0	100.0	34	4	38
Tuscany	27.3	30.3	27.3	9.1	6.1	100.0	33	4	37
Rhone-Alpes	14.3	42.9	42.9	0.0	0.0	100.0	28	9	37
Paca	5.0	45.0	35.0	10.0	5.0	100.0	20	6	26
Catalunya	4.0	8.0	72.0	12.0	4.0	100.0	25	4	29
Murcia	9.4	46.9	31.3	12.5	0.0	100.0	32	7	39
Total area	**16.9**	**36.0**	**36.6**	**8.1**	**2.3**	**100.0**	**172**	**34**	**206**

With reference to individual regions, increases in prices of between 20% and 40% are noted by 72% of the firms in Catalunya and 43% of the firms in Rhone-Alpes, while increases of between 10% and 20% characterise the majority of firms in Murcia, Paca and Lombardy, and 43% in Rhone-Alpes. In addition, in the two Italian regions, approximately 30% of firms state that they do not apply any price increases for organic products with respect to conventional ones.

With regard to the distribution channels of the processing firms, the survey revealed that 29% of the firms use shops specialized in organic products (Figure 2). This channel appears particularly important in regions such as Paca and Catalunya. Direct sales also play a significant role in distribution, being used by 25% of the firms, while only 21% of the firms state that they use supermarkets as the main trade channel. Among the other commercialisation modalities, wholesale trading is used by 14% of firms, while canteens, restaurants and agritourism activities constitute channels that are not widely used for organic products. Therefore, the specialised distribution channels represent the main retail stores used by processing firms. Nevertheless, the availability of organic product in unspecialised retail chains (such as supermarkets) has contributed to the development of the organic market. In addition, exports can also represent a commercial channel for organic products, as is the case for Rhone-Alpes, Paca and Murcia.

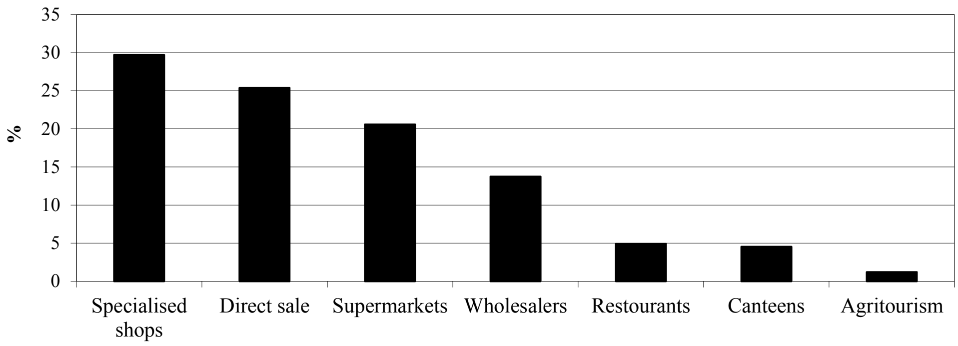

Figure 2. Most relevant distribution channels of the processing firms for organic products.

It is interesting to note that most of the firms supplying supermarkets (63%) use specific contracts for the commercial relations of organic products. For the processors, contracts with supermarkets can reduce the level of risk relative to sales and help define qualitative specifications for organic products, despite the strong bargaining power of supermarkets.

Most of the processing firms declare that they intend to develop this sector, indicating that the organic market enjoys possibilities for further growth. The number of firms that intend to increase organic products is particularly high in Murcia and the French regions (more than 80%), while it appears to be limited (51%) in Lombardy.

The development of organic production is mainly based on new products for 47% of the firms and on new markets for 24% of the firms (Figure 3). Moreover, as regards innovation, 60% of the firms have carried out research and development activity, based mostly on internal resources.

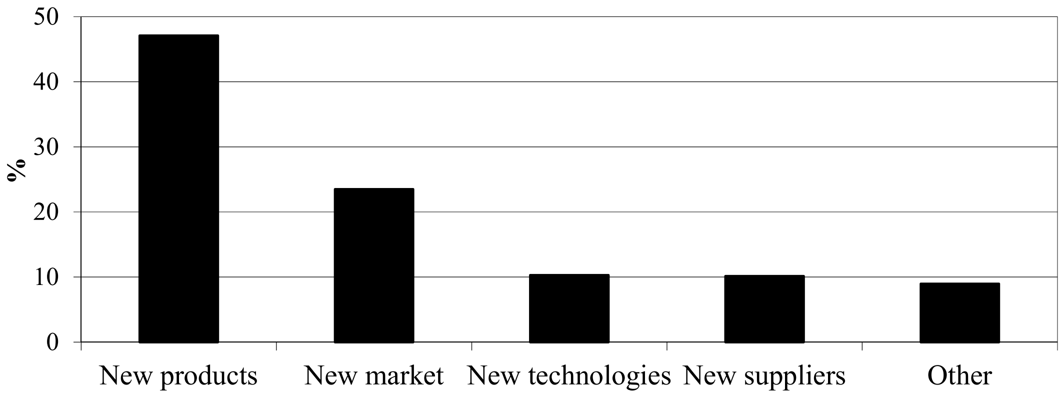

Figure 3. Main implemented actions by processing firms to develop organic products (% of sample of processing firms).

4.2. Vertical Coordination with Agriculture

With regard to raw materials provisioning, almost half of the processing firms (45%) use agricultural commodities for the transformation process, while a further 27% use semi-finished items together with agricultural raw materials. Hence, the quota of firms that have a direct connection with farms is equal to 72%. On the other hand, 22% of the firms use, for the most part, either semi-finished items or finished products, carrying out a second transformation or packaging phase activity (Table 3).

Table 3. Inputs utilised by the organic processing firms.

Regions	Agricultural Raw Materials	Semi-Finished Products	Agricultural Raw Materials + Semi-Finished Products	Finished Products	Other	Total
			%			
Lombardy	65.8	21.1	7.9	5.3	0.0	100.0
Tuscany	60.6	9.1	6.1	18.2	6.1	100.0
Rhone-Alpes	10.8	10.8	78.4	0.0	0.0	100.0
Paca	30.8	15.4	15.4	11.5	26.9	100.0
Catalunya	34.5	31.0	34.5	0.0	0.0	100.0
Murcia	60.5	2.6	18.4	10.5	7.9	100.0
Total area	**44.8**	**14.4**	**27.4**	**7.5**	**6.0**	**100.0**

The peculiarity of the organic supply chain is connected to the fact that all sectors, from organic farming to distribution, abide by the rules of organic production. The qualities of the organic product must be preserved through all stages of the production chain. Hence, it is reasonable to suppose that the organic production chains display more intensive vertical coordination between agriculture and the processing sector than conventional chains. In our analysis, about 45% of the organic processing firms employed agricultural raw materials as inputs, thus having a direct relation with agriculture. In Lombardy, Tuscany and Murcia, the supplies for more than 60% of the firms are based on agricultural raw materials, while in Rhone-Alpes, some 78% of firms use both agricultural and semi-finished products.

As regards supply modalities, the majority of firms (55%) use, for input purchasing, supply contracts, while the spot market was used by 23% of firms (Table 4). It should also be noted that contracts between farms and processors represent an instrument that favours a strong production connection between the two phases of the chain, allowing a greater degree of vertical coordination, which also permits specification of quality features for the raw materials. The integration between the agricultural sector and processing is quite strong, as the processor must be certain about the origin of raw material and about the fact that the farm complies with organic process standard. For this reason, in the relations between agriculture and processing, contracts are more frequent with respect to the spot market.

Table 4. Type of purchasing for the organic processing firms.

Regions	Supply Contracts	Spot-Market	Goods Stock Exchange	Other	Total
			%		
Lombardy	70.3	13.5	0.0	16.2	100.0
Tuscany	70.6	17.6	0.0	11.8	100.0
Rhone-Alpes	45.9	51.4	2.7	0.0	100.0
Paca	33.3	57.1	0.0	9.5	100.0
Catalunya	51.7	0.0	0.0	48.3	100.0
Murcia	51.4	8.6	0.0	40.0	100.0
Total area	**55.4**	**23.3**	**0.5**	**20.7**	**100.0**

Within the context of individual regions, contracts are particularly important in the two Italian regions (70% of the firms) and in the two Spanish regions (51% of firms), while the spot market assumes greater significance in the French regions. As we will analyse below, these differences can be connected to the geographic area for provisions. Indeed, in the French regions, the national market and imports play a more important role than in the Spanish and Italian ones, where local and regional provisions are crucial. This can explain the diffusion of contracts in Spanish and Italian regions, with a higher degree of vertical coordination, and of the spot market in French ones.

The geographical markets from which processing firms purchase their supplies are mainly represented by national markets (31% of firms in the processing sample) and by local markets (30%), though the regional market also appears significant (22%) (Table 5).

Table 5. Markets of organic purchasing for the organic processing firms.

Regions	Local	Regional	National	Foreign EU Countries	Foreign non EU Countries	Total
				%		
Lombardy	21.6	29.7	32.4	13.5	2.7	100.0
Tuscany	47.2	22.2	25.0	2.8	2.8	100.0
Rhone-Alpes	13.5	16.2	35.1	18.9	16.2	100.0
Paca	16.0	12.0	48.0	16.0	8.0	100.0
Catalunya	58.6	10.3	24.1	6.9	0.0	100.0
Murcia	26.3	36.8	26.3	2.6	7.9	100.0
Total area	**30.2**	**22.3**	**31.2**	**9.9**	**6.4**	**100.0**

On the other hand, the role of foreign markets appears to be quite limited with respect to supplies purchasing: only 16% of firms state that they purchase most of their supplies abroad.

As regards imports, it is important to consider quality problems due to different regulations in EU and non-EU countries.

However, in the case of Rhone-Alpes, foreign supplies assume a greater degree of relevance, since it is the path chosen by 35% of firms. This could be due to the fact that, in such a region, the aromatic and medicinal organic plants play a relevant role. In Paca too, supplies from abroad appear to be significant (24% of firms), though, in this region, 48% of firms carry out their purchasing on the national market. On the other hand, supplies via the local market are especially prevalent in Tuscany (47%) and Catalunya (59%).

4.3. Vertical Coordination with Retailing

Regarding vertical relations between processors and retailers, the majority of the processing firms (60%) have not indicated any excessive bargaining power on the part of their customers. This fact can be explained by the significant diffusion of distribution channels that do not exercise strong vertical competition, like specialized organic shops and direct sales.

However, in the case of Lombardy and Murcia, most of the firms (79% and 53%, respectively) consider their customers' bargaining power to be excessive, due to the fact that supermarkets are the main trade channel in these regions.

To better understand the vertical relationships between processors and retailers, in this section, the analysis focuses on a sample of retailers that consist of small shops specialized in organic products (92%) and supermarkets (8%), as outlined earlier. Vertical coordination between processors and retailers is affected by two main factors: the retailer strategies and the supply chain constraints.

With regard to the retailer strategies, as highlighted before, the retailers' choice to sell organic products is associated with consumer willingness to pay a premium price for quality and safety attributes. Retailers consider the quality of organic production to be an advantage in characterising the sector.

The survey underlines that the premium price most frequently applied by retailers ranges from 10% to 40% (Table 6).

Table 6. Average premium price of organic products vs. conventional products for retailers.

Regions	None	10%–20%	20%–40%	40%–80%	More Than 100%	Total
				%		
Lombardy	28.6	14.3	42.9	14.3	0.0	100.0
Tuscany	10.0	50.0	40.0	0.0	0.0	100.0
Rhone-Alpes	6.3	87.5	6.3	0.0	0.0	100.0
Paca	6.3	43.8	37.5	12.5	0.0	100.0
Catalunya	7.1	7.1	85.7	0.0	0.0	100.0
Murcia	0.0	55.6	33.3	11.1	0.0	100.0
Total area	**8.3**	**45.8**	**40.3**	**5.6**	**0.0**	**100.0**

Indeed, 46% of the retailers declare that they apply a price increase of 10%–20% with respect to conventional products, while 40% apply increases of 20%–40%. None of the retailers apply increases greater than 100%, and only a few operators increase prices by 40%. A very small proportion (8%) of retailers in the organic product trade declare that they do not apply any premium price. These values appear in line with those revealed in the analysis of processing firms. With regard to supply chain constraints, the 36% of retailers declare that the price of organic products represents an important factor limiting adequate retailer activity development (Table 7).

Table 7. Issues that should be improved by the suppliers of retailers.

Regions	Delivery Time	Reliability of Delivery/Overall Quality of the Service	Price	Innovation Rate (add New Products)	Flexibility in Changing Pre-defined Delivery Plans	New Co-operative/Innovative Processes in Logistics Management	Total
				%			
Lombardy	0.0	37.5	50.0	0.0	12.5	0.0	100.0
Tuscany	40.0	10.0	50.0	0.0	0.0	0.0	100.0
Rhone-Alpes	0.0	37.5	12.5	43.8	0.0	6.3	100.0
Paca	6.7	26.7	33.3	26.7	0.0	6.7	100.0
Catalunya	40.0	10.0	30.0	10.0	5.0	5.0	100.0
Murcia	10.0	10.0	65.0	15.0	0.0	0.0	100.0
Total area	**17.7**	**21.5**	**36.1**	**18.4**	**2.5**	**3.8**	**100.0**

In the Murcia region, the 65% of retailers declare that the high cost of raw materials, in terms of agricultural input and unprocessed products, is the main issue that should be improved in the processing phase. On the other side, in Lombardy and Tuscany, it is the 50%, and in Paca and Catalunya, approximately 30%. In Rhone-Alpes, instead, only a small quota of firms (13%) perceive price as a limiting factor.

In addition to the price constraints, the organisation between retailers and processors could also certainly be improved. Indeed, an important issue is represented by the product delivery times. Eighteen percent of retailers complain of long delays, and 21% lack reliability of delivery (and service quality level), indicating a scarce respect for the delivery schedules.

The survey highlights that product innovation rate is also relevant for organic production development: 18% of the retailers complain about poor levels of new products and service. The demand for new products is of particular relevance in the French area, both in Rhone-Alpes and Paca.

Moreover, most retailers declare their intention to develop organic product distribution. On the other hand, as a consequence of the above-mentioned aspects of quality strategies and supply chain constraints, most retailers consider the selling price of food products the main weakness of the organic sector. Furthermore, in almost all of the analysed regions, the consumer's lack of awareness concerning the advantages of organic products is cited as a limiting factor to further sector development. This is confirmed by the need to clarify the position of organic products in the market and to rationalise the extent and use of brand names, together with the need to increase marketing and promotion actions.

5. Conclusions

The aim of the paper is to better understand the vertical relationships among the organic supply chain with a specific focus on the processing and retailing sectors. The analysis takes into account different regions of the EU Mediterranean area. With regard to processing firms, the main issue highlighted by the analysis is related to the guarantee of products' safety and quality levels. The tools to implement quality management are based on the adoption of specific production regulations and quality controls. The analysis shows that the premium prices that processing firms expect to achieve ranges between 20% and 40% for 37% of the processing sampled firms, and from 10% to 20% for 36% of the firms. The main distribution channels for the processing firms are specialized shops selling organic products, direct sales and supermarkets. The majority of the firms indicate quite a low bargaining power on the side of their customers. This can be explained by a weak vertical competition of the distribution channels such as the organic specialized shops and direct sales. As for the supermarkets, the relations with processors are instead characterized by quite a strong vertical competition.

Concerning the vertical relations between processing firms and agriculture, the organic production chains generally display more intensive vertical coordination compared to conventional ones, and this is mainly attributable firstly to the use of supply contracts and secondly to the geographical areas. The first aspect concerns the supply contracts adopted by the majority of processing firms. The supply contracts allow a greater degree of vertical coordination, involving more interaction between the operators of the chain, as a set of rules are fixed (delivery schedule, pricing method, and product characteristics) in order to guarantee specific quality features. The second is related to the fact that the firms purchase the raw materials mainly from national, regional and local markets, facilitating a vertically coordinated production.

As for the vertical relation between processing firms and retailers, the analysis revealed some opportunities and constraints. From the retailers' point of view, the quality of organic production represents an advantage for the sector, as the consumers' willingness to pay a premium price for organic products is mainly linked to the quality and safety attributes. On the other hand, prices of organic products that are too high are perceived as a limit for the development of sales in retailing. Other constraints are represented by delivery time and reliability in delivery, as long delays and low observance of delivery schedules are shown in the survey.

New opportunities for the organic sectors emerge from the recent reform of the Common Agricultural Policy. Specifically, this reform has reinforced some measures for environmental agricultural practices, for example "greening". Organic farmers are already oriented towards environmentally friendly practices, and they can benefit from the payment established for greening without any changes in agricultural procedure.

Finally, the survey underlines the need to clarify the position of organic products in the market and to increase marketing and promotion actions. In this direction, the EU has designated funds for trade organizations to support increasing awareness of organic production among consumers.

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References

1. Mokdad, A.; Marks, J.; Stroup, D.; Gerberding, J. Actual causes of death in the United States. *J. Am. Med. Assoc.* **2004**, *291*, 1238–1245. [CrossRef] [PubMed]
2. Wansink, B. *Mindless Eating: Why We Eat More Than We Think*; Bantan-Dell: New York, NY, USA, 2006.
3. Barreiro-Hurlè, J.; Gracia, A.; De Magistris, T. Does nutrition information on food products lead to healthier food choices? *Food Policy* **2010**, *35*, 221–229. [CrossRef]
4. Miller, L.M.S.; Cassady, D.L. Making healthy food choices using nutrition facts panels. The roles of knowledge, motivation, dietary modifications goals, and age. *Appetite* **2012**, *59*, 129–139. [CrossRef] [PubMed]
5. Yiridoe, E.K.; Bonti-Ankomah, S.; Martin, R.C. Comparison of consumer perceptions and preference toward organic *versus* conventionally produced foods: A review and update of the literature. *Renew. Agric. Food Syst.* **2005**, *20*, 193–205. [CrossRef]
6. Cavaliere, A.; Ricci, E.C.; Solesin, M.; Banterle, A. Can health and environmental concerns meet in food choices? *Sustainability* **2014**, *6*, 9494–9509. [CrossRef]
7. Lea, E.; Worsley, T. Australians' organic food beliefs, demographics and values. *Br. Food J.* **2005**, *107*, 855–869. [CrossRef]
8. Padel, S.; Foster, C. Exploring the gap between attitudes and behaviour. Understanding why consumers buy or do not buy organic food. *Br. Food J.* **2005**, *107*, 606–625.
9. De Magistris, T.; Gracia, A. The decision to buy organic food products in Southern Italy. *Br. Food J.* **2008**, *110*, 929–947. [CrossRef]
10. Chen, M.F. Attitude toward organic foods among Taiwanese as related to health consciousness, environmental attitudes, and the mediating effects of a healthy lifestyle. *Br. Food J.* **2009**, *111*, 165–178. [CrossRef]

11. Haghiri, M.; Hobbs, J.E.; McNamara, M.L. Assessing consumer preferences for organically grown fresh fruit and vegetables in Eastern New Brunswick. *Int. Food Agribus. Manag. Rev.* **2009**, *12*, 81–100.
12. Mondelaers, K.; Verbeke, W.; van Huylenbroeck, G. Importance of health and environment as quality traits in the buying decision of organic products. *Br. Food J.* **2009**, *111*, 1120–1139.
13. Schiffman, L.G.; Kanuk, L.L. *Consumer Behavior*, 10th ed.; Prentice Hall: Upper Saddle River, NJ, USA, 2010.
14. Yin, S.; Wu, L.; Du, L.; Chen, M. Consumers' purchase intention of organic food in China. *J. Sci. Food Agric.* **2010**, *90*, 1361–1367. [CrossRef] [PubMed]
15. Lee, H.J.; Yun, Z.S. Consumers' perceptions of organic food attributes and cognitive and affective attitudes as determinants of their purchase intentions toward organic food. *Food Qual. Preference* **2015**, *39*, 259–267. [CrossRef]
16. Kesse-Guyot, E.; Pe'neau, S.; Mèjean, C.; Szabo de Edelenyi, F.; Galan, P.; Hercberg, S.; Lairon, D. Profiles of Organic Food Consumers in a Large Sample of French Adults: Results from the Nutrinet-Santè Cohort. *PLoS ONE* **2013**, *8*, 1–13.
17. Magnusson, M.K.; Arvola, A.; Hursti, U.K.K.; Aberg, L.; Sjoden, P.O. Choice of organic foods is related to perceived consequences for human health and to environmentally friendly behaviour. *Appetite* **2003**, *40*, 109–117. [CrossRef]
18. Roininen, K.; Arvola, A.; Lahteenmaki, L. Exploring consumers' perceptions different qualitative of local food with two techniques: Laddering and word association. *Food Qual. Preference* **2006**, *17*, 20–30. [CrossRef]
19. Willer, H. European Organic Market Continued to Grow in 2014. FiBL—Research Institute of Organic 2016. Available online: http://www.fibl.org/en/media/media-archive/media-archive16/media-release15/article/biomarkt-in-europa-2014-um-fast-8-prozent-gewachsen.html (accessed on 25 May 2016).
20. Eurostat. *Agriculture Forestry and Fishery Statistics 2014 Edition*; Publications Office of the European Union: Luxembourg, 2015; pp. 2363–2488.
21. Heid, A.; Hamm, U. Animal welfare *versus* food quality: Factors influencing organic Consumers' preferences for alternatives to piglet castration without anaesthesia. *Meat Sci.* **2013**, *95*, 203–211. [CrossRef] [PubMed]
22. Commission of the European Communities. European Action Plan for Organic Food and Farming, SEC (2004) 739 annex to COM (2004) 415 Final, Brussels, 10 June 2004. Available online: ec.europa.eu/agriculture/organic/documents/eu-policy/european-action-plan/organic-action-plan-2004_en.pdf (accessed on 25 May 2016).
23. Communication from the Commission to the European Parliament, the Council, the European economic and Social Committee of the Regions—Action Plan for the Future of Organic Production in the European Union, COM(2014) 179 Final, Brussels, 24 March 2014. Available online: ec.europa.eu/agriculture/organic/documents/eu-policy/european-action-plan/act_en.pdf (accessed on 25 May 2016).
24. Bonti-Ankomah, S.; Yiridoe, E.K. Organic and Conventional Food: A Literature Review of the Economics of Consumer Perceptions and Preferences'. Available online: http://www.organicagcentre.ca/Docs/BONTI%20%26%20YIRIDOE%20April%2028%202006%20Final.pdf (accessed on 25 May 2016).
25. Vermeir, I.; Verbeke, W. Sustainable food consumption: Exploring the consumer's attitude-behavioural intention' gap. *J. Agric. Environ. Ethics* **2006**, *19*, 542–553. [CrossRef]
26. Chen, M.F. Consumer attitudes and purchase intentions in relation to organic foods in Taiwan: Moderating effects of food-related personality traits. *Food Qual. Preference* **2007**, *18*, 1008–1021. [CrossRef]
27. Aertsens, J.; Verbeke, W.; Mondelaers, K.; van Huylenbroeck, G. Personal determinants of organic food consumption: A review. *Br. Food J.* **2009**, *111*, 1140–1167.
28. Suh, B.W.; Eves, A.; Lumbers, M. Consumer's Attitudes and Understanding of Organic Food: The Case of South Korea. *J. Foodserv. Bus. Res.* **2012**, *15*, 49–63. [CrossRef]
29. Canavari, M.; Bazzani, G.M.; Spadoni, R.; Ragazzi, D. Food safety and organic fruit demand in Italy: A survey. *Br. Food J.* **2002**, *104*, 220–232. [CrossRef]
30. Krystallis, A.; Chryssohoidis, G. Consumers' willingness to pay for organic food—Factors that affect it and variation per organic product type. *Br. Food J.* **2005**, *107*, 320–343. [CrossRef]
31. Gil, J.M.; Gracia, A.; Sànchez, M. Market segmentation and willingness to pay for organic products in Spain. *Int. Food Agribus. Manag. Rev.* **2000**, *3*, 207–226. [CrossRef]
32. Olesen, I.; Alfnes, F.; Røra, M.B.; Kolstad, K. Eliciting consumers' willingness to pay for organic and welfare-labelled salmon in a non-hypothetical choice experiment. *Livest. Sci.* **2010**, *127*, 218–226. [CrossRef]
33. Nelson, P. Information and consumer behaviour. *J. Political Econ.* **1970**, *78*, 311–329. [CrossRef]

34. Darby, M.R.; Karni, E. Free competition and the optimal amount of fraud. *J. Law Econ.* **1973**, *16*, 67–88. [CrossRef]
35. Caswell, J.A.; Mojduszka, E.M. Using Informational Labeling to Influence the Market for Quality in Food Products. *Am. J. Agric. Econ.* **1996**, *78*, 1248–1253. [CrossRef]
36. Baecke, E.; Rogiers, G.; De Cock, L.; Van Huylenbroeck, G. The supply chain and conversion to organic farming in Belgium or the story of the egg and the chicken. *Br. Food J.* **2002**, *104*, 163–174. [CrossRef]
37. Franks, J. Current issues in marketing organic milk in the UK. *Br. Food J.* **2003**, *105*, 350–362. [CrossRef]
38. Grandori, A. Improving organization forms in the agri-food industry. *Br. Food j.* **2015**, *117*, 2418–2434.
39. Banterle, A.; Stranieri, S. The consequences of voluntary traceability system for supply chain relationships: An application of transaction cost economics. *Food Policy* **2008**, *33*, 560–569. [CrossRef]
40. Kalton, G. *Introduction to Survey Sampling*; Sage Publications: Beverly Hills, CA, USA, 1983.
41. Banterle, A.; Cereda, E.; Fritz, M. Labelling and sustainability in food supply networks: A comparison between the German and Italian markets. *Br. Food J.* **2013**, *115*, 769–783. [CrossRef]
42. Hobbs, F.E.; Young, L.M. Closer vertical co-ordination in agri-food supply chains: A conceptual framework and some preliminary evidence. *Supply Chain Manag. An Int. J.* **2000**, *5*, 131–142. [CrossRef]
43. Mazzocchi, M. *Statistics for Marketing and Consumer Research*; SAGE Press: Thousand Oaks, CA, USA, 2008.