

# Organizational models in the Sicilian ornamental plant industry: an empirical analysis based on transaction cost theory

ANTONINO GALATI\*, MARIA CRESCIMANNO\*,  
MARCELLA GIACOMARRA\*\*, SALVATORE TINERVIA\*

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## Introduction

During the last few decades, the process of market globalization has led to patterns of consumption and production which are more similar and convergent, fueling fierce competition among companies. Business models of how to compete in domestic and international markets have been redefined in particular by the supply into international markets of agricultural commodities and food products by emerging countries characterized by high endowment of natural resources and low production costs.

Increased international competition due to the entry of new production realities and the decline of demand in the last few years as a consequence of the international financial and economic crisis have entailed deep transformation of several agricultural sectors, including the flower and ornamental plant industry. From a socio-economic viewpoint, this is one of the most important agricultural sectors of some Italian regions, including Sicily, where the industry has a strategic role in terms of employment and income for both workers of the primary sector and those involved in many interconnected activities (Schimmenti, 2009; Schim-

## Abstract

*The process of market globalization has led to a redefinition of business models in order to compete in domestic and international markets. In the current competitive scenario, the survival of companies is linked to their ability to reduce or contain the sum of both production and transaction costs. The aim of this paper is to identify the existence of similar organizational models of a sample of Sicilian firms active in the Ornamental Plants sector based on those transaction costs that they support in relation to the sales channel and the other human and firm characteristics. Using a clustering procedure, we identified four well-distinct organizational models whose formation is influenced not only by the physical and economic size of firms but also by the transaction costs experimented. A reconsideration of these models, both in cooperatives and in small firms managed by young entrepreneurs, is needed.*

**Keywords:** Transaction costs, Sale channels, Organizational models, Ornamental plants sector

## Résumé

Le processus de mondialisation du marché a conduit à une redéfinition des modèles d'affaires afin d'accroître la compétitivité sur le marché national et international. Dans le scénario compétitif actuel, la survie des entreprises est liée à leur capacité à réduire ou contenir la somme des coûts de production et de transaction. Le but de cet article est de vérifier la présence de ces modèles d'organisation au sein d'un échantillon d'entreprises siciliennes qui travaillent dans le secteur des plantes ornementales, compte tenu des coûts de transaction qu'elles soutiennent par rapport au canal de vente et aux autres caractéristiques humaines et structurelles. En utilisant une procédure de *clustering*, nous avons identifié quatre modèles d'organisation bien définis qui dépendent non seulement de la dimension physique et économiques de l'entreprise mais aussi des coûts de transaction soutenus. Il est donc nécessaire de reconsidérer ces modèles au niveau des coopératives et des petites entreprises gérées par de jeunes entrepreneurs.

**Mots-clés:** Coûts de transaction, canal de vente, modèles d'organisation, secteur des plantes ornementales.

menti *et al.*, 2010; Crescimanno *et al.*, 2014a; Crescimanno *et al.*, 2014b). Table 1 offers an overall description of the Sicilian flower and ornamental plant sector. According to the VI Agricultural Census (2011), Italy's surface area devoted to flower and ornamental plants amount to 1,448 hectares (11.38% of the Italian area) managed by 921 firms (6.54%).

Although the average surface is reasonable at 1.6 hectares, it is higher than the average Italian size (0.9 hectares), showing that these companies are characterized mainly by basic structure and family firms. This is confirmed by a high number of individual firms both at national and regional levels; indeed, less importance is given to cooperatives and other legal forms. In terms of value,

Sicilian flowers and ornamental plant production is worth € 233.9 million (9.41% of Italian production and 7.28% of value-added produced by the Sicilian agricultural sector) (I-STAT, 2015). In the last decade (2004-2013), there has been a modest increase in the value-added produced (0.7%) owing to the only increase, namely, the value produced by the nursery sector (13.9%). Furthermore, flowers and ornamental plants represent one of the Sicilian agri-food sectors that shows a positive trade balance, which amounted on average to € 31.8 million in 2012, showing a marked trade specialization (51.6%), which is more than the comparative advantage recorded by the whole Italian sector (INEA, 2013). The competitiveness of the sector is obstructed by a struc-

\* Department of Agricultural and Forest Sciences, Università degli Studi di Palermo (Italy), Viale delle Scienze, Ed. 4, 90128, Palermo, Italy. Corresponding author: E-mail: antonino.galati@unipa.it

\*\* Department of Economic, Business and Statistical Sciences, Università degli Studi di Palermo (Italy), Viale delle Scienze, Ed. 13, 90128, Palermo, Italy.

Tab. 1 - *Flower and Ornamental Plants sector description.*

	Italy	Sicily	Sicily/Italy (%)
Number of firms <sup>a</sup>	14,093	921	6.54
- Individual firms	12,041	728	
- Cooperatives	1,938	182	
- Other legal forms	114	11	
Harvested area (hectares) <sup>a</sup>	12,724	1,448	11.38
- Average surface (hectares)	0.9	1.6	
Added-value (thousand of Euros) <sup>b</sup>	2,486,905	233,941	9.4
- Contribution to the AV produced by the agricultural sector (%)	7.49	7.28	
Import value (million of euros) <sup>c</sup>	486.6	14.92	3.07
- % on agri-food imports	1.3	1.80	
Export value (million of euros) <sup>c</sup>	678.3	46.69	6.88
- % on agri-food exports	2.1	4.8	
Normalized Trade Balance (%) <sup>c</sup>	16.5	51.6	

<sup>a</sup> Year 2010 (ISTAT).

<sup>b</sup> Year 2013 (ISTAT).

<sup>c</sup> Year 2012 (INEA).

tural weakness mainly due to commercial and logistical aspects; for example, the presence of an excessive number of active economic agents along the supply chain leads to increased distribution costs and the inefficiency of the regional transport system (Schimmenti *et al.*, 2008; Schimmenti, 2009). In this context, improving the organizational efficiency of businesses with a consequent contraction of the total costs incurred could increase their competitiveness in domestic and international markets.

Indeed, a more effective organization of production, logistics, and marketing activities could help to reduce the sum of both production and transaction costs. However, if reducing production costs is not so easy on the one hand, taking into account the exponential increase in the last few years of the price of both raw materials and energy costs, on the other hand, companies are more likely to optimize transaction costs related to organization of economic activities and, in particular, to exchange relationships.

Over the last few years, transaction costs have received greater attention in the economic literature with the aim of analyzing the main factors affecting the strategic decisions of companies that operate in the agri-food sector. In particular, our study sets out to identify the existence of similar organizational models in a sample of companies operating in the Sicilian ornamental plant industry in relation to the transaction costs experimented and other human and firm characteristics. The interest of such analysis starts from the consideration that, apart from production costs, the choice of organizational models and the market competitiveness of firms can be affected by transaction costs.

The rest of this paper has been organized as follows. The first section analyzes the theoretical framework and the literature review related to the studies on the transaction costs in the agri-food sector. The second section shows the methodological approach used to address the research aim. The results of the direct survey are presented in the third section and discussed in the fourth section. The last section contains final considerations and some concluding remarks from the authors.

## Theoretical basis and literature review

Transaction costs theory (TCT), of which Ronald Coase and Oliver Williamson are the main representatives, is one of the current ways of thinking about the neo-institutional theory that, since the 1980s, has been one of the richer interpretations of contemporaneous economic theory. According to Williamson, economic agents choose institutions, organizational forms, and transactions that minimize the costs of exchange between agents, called transaction costs, depending on the dimension and frequency of the transaction and behavioural assumptions (Williamson, 1985; Royer, 2011). These costs, as Williamson (1986) suggests, emerge

as a consequence of information asymmetry, limited rationality, and opportunism, producing market imperfection and market failure. In particular, the concepts of 'limited rationality' and 'opportunistic behaviour' are used by Williamson in order to explain the contractual choice and the governance structure. Another assumption of the TCT is that all transactions are carried out with a certain level of information asymmetry, which can exert the relevant influence on the exchanges.

In existing studies, transaction costs are split into ex-ante and ex-post (Williamson, 1985), in fixed and proportional transaction costs (Goetz, 1992; Key *et al.*, 2000; Vakis *et al.*, 2003), and into information, negotiation, and monitoring costs (Hobbs, 1997, Kyeyamwa *et al.*, 2008; Royer, 2011; Woldie and Nuppenau, 2011). Ex-ante costs are fixed costs incurred by firms before and during the transaction and include the search cost of information about price, screening a partner with whom to exchange, quality of traded products (information costs), and costs for negotiating, bargaining, and drawing up contracts (negotiation costs). Ex-post costs are mainly proportional costs incurred after the contract has been signed but before the entire transaction has been completed and are all the costs related to the operational control (monitoring costs) that avoid late delivery, errata delivery, and damages occurred during travel.

In the last few years, several authors have focused on the analysis of transaction costs, developing theoretical concepts and empirical research in different countries and economic sectors. In general, these studies reveal a relevant impact of transaction costs on business governance and organizational models. In particular, the TCT has been used to evaluate the goodness of the strategic choices of firms concerning sales channels, adherence to common organizations, and in-sourcing or out-sourcing of enterprises activities.

There are many studies that show a positive relationship between, on one hand, transaction costs, firm, product, and human characteristics, and, on the other, vertical integration models. Vertical integration emerges as an effective tool in order to generate economies of scale and to reduce the asymmetric information and opportunism among the different fig-

ures that operate along the supply chain and generate higher transaction costs (Fundira, 2004). In particular, vertical co-ordination may have an enhanced role in reducing negotiation costs and mainly tangible transaction costs (linked to, e.g., transport and storage, credit, and market) between producers, input providers, and processors in the agri-food sector (Hobbs and Young, 2000; Birtal *et al.*, 2005). However, vertical co-ordination entails an increase of operational control, and consequently, of monitoring cost, the intensity of which changes from being exercised predominantly ex-ante to ex-post (Peterson *et al.*, 2001).

The TCT has been used in order to explain the influence of the exchange costs on the sales channel choice and the opportunity to access specific markets. Several authors show in greater detail that the main determinants of market channel choices are information costs (linked to the difficulty in finding information and time spent researching price information) and negotiation costs (expressed in time spent in the negotiation process, low bargaining power, and transport cost, depending on the distance from markets). These costs negatively influence the producer's choice to sell at wholesalers or the formal market (Woldie and Nuppenau, 2011; Mabuza *et al.*; 2014) or are a significant deterrent to high-value market participation of those agricultural households (Key *et al.*, 2000; Renkow *et al.*, 2004; Alene *et al.*, 2008; Escobal and Cavero, 2012). Blandon *et al.* (2009) find that the perceived risk associated with monitoring quality and the payment delays (high monitoring costs) dissuade the farmers from participating in new supermarket supply chains for fruit and vegetables in Honduras.

Others studies use the TCT to estimate the impact and determinants of companies' participation in the form of horizontal coordination and other types of associations. Much empirical research confirms that in several cases, cooperatives are an appropriate vehicle to first, reduce transaction costs, which emerge from dealing with a food system characterized by different rules, regulations, and players in international markets (Pingali *et al.*, 2005), and second, to improve generally the business performances of farmers. Royer (2011) and Staal *et al.* (1997) find that participation in cooperatives or marketing boards leads to a lowering of information costs (information research) and negotiation costs (less time spent reading and signing contracts). If it is true that the adhesion to collective action helps to reduce some transaction costs, this can generate higher costs related to the management of the structures, uncertainty of access to inputs, and higher time to delay payments, and it makes the direct sales to intermediaries or traders most advantageous (Gabre-Madhin, 1999; Holloway *et al.*, 2000; Lemeilleur and Codron, 2011; Mujawariya *et al.*, 2013; Lijia and Xuexi, 2014).

The results of empirical research that links transaction costs with the various forms of coordination between firms, reveal that transaction costs are reduced with increasing size of firms, and in particular, negotiation costs are lowered as a result of increased bargaining power (Kyeyamwa *et al.*, 2008; Woldie and Nuppenau, 2011).

Other research fields in which TCT has been used are those related to traceability systems and quality certification. Banterle *et al.* (2006, 2008a) reveal that while the adoption of traceability systems reduces the degree of transaction uncertainty, they imply an increase of monitoring costs. This effect is particularly evident in firms that conduct transactions through the use of contracts, while it is less evident in those companies that adopt governance based on vertical integration. This confirms that a correct governance choice can contribute not only to optimize expenses related to production costs but also to reduce certain transaction costs.

On this basis, we present the following hypotheses:

Hypothesis 1. Transaction costs affect the organizational models of Sicilian ornamental plant firms.

Hypothesis 2. Transaction costs are relevant for firms that sell products to intermediaries and the large-scale retail trade.

## Methodology

Data were collected through an interview carried out with the owners and managers of a sample of firms operating in the Sicilian ornamental plant industry, geographically located in each of the nine Sicilian provinces. Our starting sample was made up of 240 firms producing and commercializing potted plants, excluding those specialized in cut flowers, whose market characteristics differ significantly from those of the first group. This decision reduced a substantial part of the universe of the economic sub-sector selected as, in several Sicilian provinces, such as Ragusa, firms specialize mainly in cut flowers. To produce the firm contact list, we extract the information of each unit from the official websites of Proflora and Florovivaismo, collecting several pieces of information on ornamental plant firms. Due to the high mortality rate, there were successful interviews for 49 out of 240 units, with a response rate of 20.04%.

A research questionnaire was developed to gather data and was administered by phone. The questionnaire was structured in four sections: first, it collected specific information about firms (legal forms, main production, surface area in hectares, year of establishment, trading partners, annual turnover, and marketing staff, sales and production tasks) and respondents (age, professional experience in years, professional roles inside firms, and employment typology: part time or full time). The second, third, and fourth parts of the questionnaire specifically addressed information collection about the three transaction cost components incurred by firms, which are proposed by numerous authors (Hobbs, 1997; Kyeyamwa *et al.*, 2008; Royer, 2011; Woldie and Nuppenau, 2011). Distinction is made among:

1. *Information costs*, namely, the availability of information about sale prices, distribution channels, products, and process innovation. For these questions, respondents had to provide opinions about the difficulties of obtaining such kinds of information, based on a five-point Likert scale;
2. *Negotiation costs*, expressed in terms of time devoted for the arrangement of transport, commissions paid to

the distribution channel, time needed to receive final payment from buyers, and bargaining power of firms. In this case too, a Likert scale of five points was used;

3. *Monitoring costs*, linked to the management/resolution of problems arising during the transport of plants or linked to the lack of typology/quality match of the product between what the client asked for and what the seller effectively sent. In this last section, we envisaged open questions.

According to this classification and taking into account the main characteristics of the studied sector, our expectation was that transaction costs would be very low for individual firms that sell their products directly to firms and greater for companies that sell to large-scale retail distribution, in respect of which they have less bargaining power.

A cluster analysis was performed in order to group the Sicilian ornamental plant companies into homogeneous categories in terms of transaction costs supported, using the software SPSS version 19. The variables considered are knowledge of sale price; access to information about sales channels and markets; waiting time to receive payment; and transport damage. Based on the variables identified and taking into account the limited number of observations, we performed a hierarchical cluster analysis in order to group the companies into a number of categories, by maximizing both within-group homogeneity (small within-cluster variance) and among-group heterogeneity (large between-cluster variance). In order to select the most appropriate clustering method, a set of clustering criteria were considered carefully. Among these, Ward's method was identified as the more effective for differentiation scopes, both in order to maximize within-cluster homogeneity and between-cluster heterogeneity, and taking into account that the number of observations in each cluster was expected to be approximately equal and that no outliers were present among the variables included in the clustering procedures. The distances among clusters were measured using the squared Euclidean distance. The criteria adopted in order to select the most appropriate number of clusters are both statistical and conceptual. First, we analyzed the dendrogram, which graphically illustrated how the Sicilian ornamental plant firms are grouped into the clusters. Second, we performed three iterations of Ward's method with the number of clusters set at two, three, and four. Third, we identified the clusters that provide simple interpretations of the organizational models.

## Results

The 49 firms that successfully answered our interview questionnaire are located mainly in the Sicilian eastern coast (such as, Catania, Siracusa, and Messina), with a small sample from the western coast (such as, Palermo and Trapani). On the whole, they recorded average annual turnover somewhat oriented within the regional average range (less than € 500,000), with a small share of firms recording annual turnover of more than € 500,000 (Table 2). This result reflects the average size of Sicilian firms operating in the ornamental plants sector, which, according to the last General Agricultural Census 2010, is around 1.6 hectares (ISTAT, 2011).

Table 2 - *Characteristics of firms*

Number	49
Legal form:	
- <i>Individual firm</i>	34
- <i>Company</i>	15
Specialisation:	
- <i>Ornamental plants</i>	43
- <i>Ornamental plants and other products</i>	6
Surface (hectares):	
- <i>Average</i>	6.9 (min 0.1; max 50)
Sale channels:	
- <i>Direct sale</i>	5
- <i>Wholesalers</i>	30
- <i>Mix</i>	14
Turnover (€):	
- < 50.00 thousand	12
- From 50.10 to 100.00 thousand	13
- From 100.10 to 300.00 thousand	11
- > 300.10	13

Our survey takes into consideration the three identified categories of transaction costs used as an experiment in our sample.

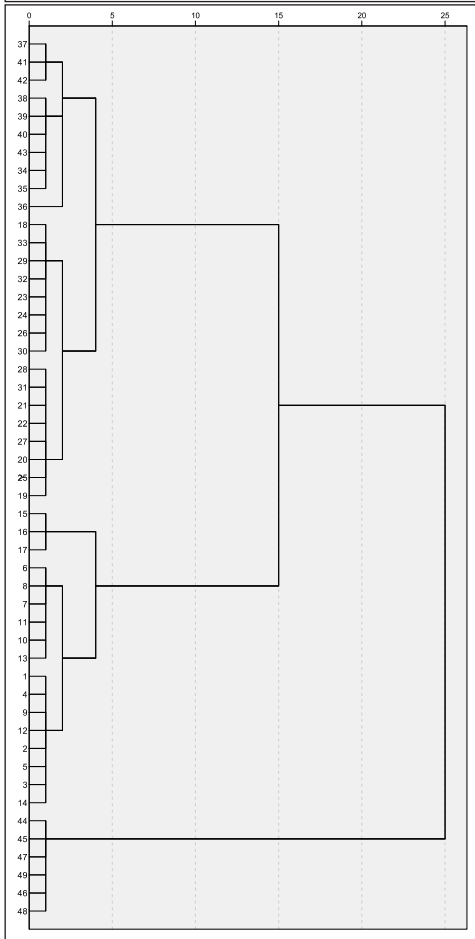
Concerning information costs, which are expressed in terms of entrepreneurial difficulties in accessing information about markets, sales channels, products, and process innovation, the results show low or no influence the sales channel choice. In particular, such kinds of costs are almost totally absent for those firms selling inside their building or through correspondence and are increasingly relevant for those firms selling to wholesalers and the large-scale retail channel (LSR). In addition, the results confirm that the *negotiation costs* are quite modest, above all for those firms that usually commercialize their products directly inside the firms. Indeed, these last firms, compared to those commercializing with intermediaries and/or with LSR, spend less time fulfilling orders and receiving payment, which usually occurs at the time of product delivery, and are more able to impose the sales price. Concluding the analysis of the sub categories of the negotiation costs effect, we can add that transport costs cannot have any influence, as they are usually at the expense of the final client.

Finally, no exhaustive information arises from the analysis of the monitoring costs. They were analyzed in terms of costs sustained by firms when damage occurred during the despatch phase. Monitoring costs are linked mainly to material damage that occurred during the transport phase but also to damage caused by non-compliance of the dispatched product with what the client ordered. In these last cases, the direct economic damage to firms can be quantified in terms of extra discounts, order withdrawals and consequent changes, garbage disposal charges, and/or credit notes.

In order to identify the existence of similar organizational models among the sample of firms operating in the Sicilian ornamental plants industry, cluster analysis was performed. The dendrogram reported in Figure 1 shows a clear 4-cluster solution obtained using the method described previously.

The abscissa reports the squared Euclidean distance between clusters, while ordinate reports the identification number of each firm grouped according to the Ward's linkage method. Each cluster includes 10, 16, 17, and 6 companies,

Figure 1 - Dendrogram obtained from the hierarchical cluster analysis using the Ward's linkage's method.



respectively. The four clusters show, for each variable, the average values reported in Table 3.

One-way analysis of variance (ANOVA) was used to test the differences in the variable means among the clusters. In particular, Table 4 shows the analysis of variance between clusters and within clusters (a cluster refers to square and error mean square), F values, and significance. The results show that the four clusters are statistically different and all variables are significant at the 95% level. In addition, Table 4

shows that the variable 'Waiting time for receiving payment' is the most influential variable on the profile of clusters ( $F = 104.615$ ), while 'Transport damage' is the least influential variable ( $F = 4.141$ ).

Firms belonging to **cluster 1** are mostly large individual firms and some large companies with, on average, 13 hectares within the group; they have long experience in the sector, with good business performance. Compared to the other clusters, the owners or managers are on average 52 years old and they have the highest education levels. In terms of transaction costs, these firms: i) show the best sales price knowledge; ii) manifest less difficulty in acquiring information about sales channels and innovations; iii) use lesser time to organize transport and receive client payments; iv) have the highest bargaining power; this is the only firm group that does not have relationships with large-scale retail channels; and v) show the least number of cases of merchandise damage during transport and of non-correspondence between the quality/typology of merchandise sent and the quality/typology of merchandise received from clients.

Firms in **cluster 2** include mainly the smallest individual firms with, on average, almost 5 hectares within the group; they have little experience in the ornamental sector, with an average turnover in a range between € 100,000 and 300,000, the lowest of the companies in clusters 1 and 3. The owners are the youngest but among them, there is the largest number of graduates. Concerning the transaction costs, these firms: i) have good knowledge of sales price; ii) show the best capacity to acquire information about sales channels and innovation; iii) spend little time organizing transport compared to receiving payments, which is the highest among the clusters; iv) have low influence on sales price, particularly in relationships with the LSR channel; v) and show the highest monitoring costs in the form of the second highest number of cases of merchandise damaged during transport and the highest number of cases of non-correspondence between the quality/typology of merchandise sent and the quality/typology of merchandise received from clients.

**Cluster 3** has the largest number of companies and cooperatives, with a significant area cultivated by ornamental plants,

the least experience in the sector studied, and the highest turnover owing to high export share. Regarding the transaction costs, these firms: i) have good knowledge of sales price; ii) manifest less difficulty in acquiring information on sales channels and innovations; iii) spend more time organizing transport but are fast enough when receiving payments; iv) have good influence on sales price owing to the high number of companies selling ornamental plants to private clients; v) and show high monitoring costs in the form of the

Table 3 - The cluster obtained and average values of variables.

Cluster	No. of cases	Knowledge of sale price	Access to information of the sales channels and market	Waiting time for receiving payment	Transport damage
1	10	0.30	2.90	2.55	0.80
2	16	1.00	1.87	2.40	0.50
3	17	0.76	2.17	0.61	0.17
4	6	0.50	1.50	5.16	0.33
Total	49	0.71	2.14	2.15	0.42

Table 4 - Analysis of variance (ANOVA) between and within clusters.

	Cluster		Error		F	Sig.
	Mean square between groups	df	Mean square within groups	df		
Knowledge of sale price	1.114	3	0.148	45	7.527	0.000
Access to the information of the sales channels and market	3.126	3	0.458	45	6.823	0.001
Waiting time for receiving payment	32.390	3	0.310	45	104.615	0.000
Transport damage	0.865	3	0.209	45	4.141	0.011

most number of cases of damaged merchandise during transport and the second highest number of cases of non-correspondence between the quality/typology of merchandise sent and the quality/typology of merchandise received from clients. This cluster includes the greater number of firms that sell their products to the large-scale retail trade.

Finally, **cluster 4** shows the highest percentage of small individual firms with, on average, almost 5 hectares within the group; they have the highest business experience in the sector of more than 43 years in business but the lowest turnover compared to other groups. These firms are managed by entrepreneurs with higher average age (more than 60 years) and almost all of them have secondary school education. In terms of transaction costs, these firms: i) show extremely low knowledge of sales price; ii) find it somewhat difficult to acquire information on sales channels and innovation; iii) have the highest negotiation costs as they spend the longest time organizing transport and receiving payments; iv) experiment with the highest bargaining power; v) and show medium monitoring costs in the form of low incidents of merchandise damage during transport and of non-correspondence between the quality/typology of merchandise sent and the quality/typology of merchandise received from clients.

## Discussion

In the sector of study, our analysis enabled us to identify four distinct organizational models, with not only physical and economic size characteristics of firms but also experimental transaction costs. In particular, information costs are very low in the studied firms, although they tend to increase both in small firms—in economic and physical terms—managed by older entrepreneurs that sell to intermediaries (cluster 4) and in firms or companies that have business relationships with intermediaries or the LSR trade. A similar result was reached by Royer (2011), according to which information costs are higher for firms producing milk in the habit of selling to marketing institutions rather than via bilateral trade contracts. In addition, Woldie and Nuppenau (2011) and Lemeilleur and Codron (2011) assert that information costs are higher for firms commercializing with wholesalers and selling agents than for firms selling their products through farmer cooperatives. The ability to acquire information may be explained, on one hand, by ornamental plant market knowledge by entrepreneurs and, above all, by their well-established relationships with trade partners, a fact that can reduce the interest of firm owners to seeking different sales channels and/or new markets. On the other hand, it may be explained by the capacity of using modern information technologies, which is especially widespread among younger entrepreneurs, and compensates for less experience in the sector. Our findings show that negotiation costs are not relevant to large companies that have no relationships to large-scale distribution (cluster 1). On the other hand, the same costs tend to increase when firms sell to intermediaries, as entrepreneurs must provide monetary commission, and to the large-scale retail trade (clusters 2 and 3). This implies a reduction in the firms' bargaining power and a consequent minor influence on the

price. A similar higher influence of negotiation costs in sales to intermediaries is observed by Hobbs (1997). Indeed, he finds that beef producers selling at auctions sustain higher negotiation costs than those selling directly to meat packers. A further confirmation comes from Woldie and Nuppenau (2011), who identify the difficulties in acquiring information together with the time spent transacting with private traders as the main deterrent to wholesaler sales. Finally, Royer (2011) finds that negotiation costs account for 50% of the weight of the total transaction costs for firms commercializing milk with the marketing board. Also with reference to the negotiation costs, as shown by the empirical survey, transport costs are always paid by the final customers, and thereby, help to reduce one of the variable components of the negotiation costs. Finally, as we expected, monitoring costs are more relevant for firms/companies that sell to intermediaries and, in particular, that have relationships with the LSR trade, compared to firms that sell to the cash market, because the former entails the need to increase operational control.

## Conclusions

In this study, we attempted to identify the existence of similar organizational models in a sample of Sicilian firms producing ornamental plants taking into account three categories of transaction costs (information, negotiation, and monitoring costs). Using a clustering procedure, we identified four distinct organizations models, with characteristics belonging to not only the physical and economic size of firms but also experimental transaction costs.

Although our results refer to a limited sample, they could be intended as preliminary inputs for managers and decision makers to improve the competitiveness of their industry in the market. The four organizational models empirically identified show a relevant influence of transaction costs incurred by firms and companies, confirming the first hypothesis, H1. Furthermore, small firms have several difficulties remaining competitive in the market and prefer commercial tools strictly linked to direct sales, in this way containing the rise of transaction costs incurred. Large firms seem to be more competitive, sustaining lower transaction costs. They usually do not commercialize with the LSR, but when this does occur, they are able to exercise high bargaining power. Finally, independently from the size, others firms that usually sell their products to intermediaries and the LSR achieve high turnover levels but experience very high monitoring and negotiation costs. This result confirms our second hypothesis, H2, according to which transaction costs are relevant for firms that sell their products through these sales channels. It seems possible to assert that if, on one hand, direct sales allow firms to reduce their transaction costs, on the other hand, such commercial behavior is not considered as a long-term sustainable strategy because it entails small firms remaining non-competitive in their market segments. In this regard, the Italian Ministry of Agriculture, Food and Forestry Policies suggests in the Italian Action Plan on the Flower and Ornamental Plant Sector (2014–2016) a move into new organizational models that can assure aggregation in order to stimu-

late competition and industrial innovation. In particular, the ministry concretely proposes a tool known as *Company Networks* to enable firms to collaborate with each other and at the same time guarantee their own independence and autonomy. A possible tool to promote such an organizational model is the first 'Made in Italy' brand for flowers and plants, known as the *Vivai Fiori Made in Italy Brand*, a voluntary certification that will probably increase the competitiveness of 'Made in Italy' products outside national borders in the medium term.

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