

Original study

Articulation entre dynamiques sectorielles et territoriales

Framework of economic institutions and governance of relationships inside a territorial supply chain: The case of organic olive oil in the Sierra de Segura (Andalusia)

Arturo Casieri¹
Bernardo De Gennaro¹
Umberto Medicamento²

¹ Department of Agricultural Economics and Policy, Evaluation and Rural Planning
University of Bari
Via Amendola, 165/A
70126 Bari
Italy

<arturo.casieri@agr.uniba.it>
<bernardo.degennaro@agr.uniba.it>

² Department of Production Science, Engineering, Mechanics, Economics in Agricultural and Livestock Systems
University of Foggia
Via Napoli, 25
71100 Foggia
Italy
<u.medicamento@mail.unifg.it>

Abstract

The aim of the current paper is to focus on the processes that rule transactions among firms, trying to highlight coordination forms. In stable social networks exchange occurs because of certain social elements, such as trust and reputation, which have a good influence on clarifying the expectations of the parties involved and on audit cost reductions. In this case social capital represents the coordination form that enables such relationships. To prove this statement we analyzed the network of socio-economic relationships in the organic olive oil supply chain in the Sierra de Segura (Andalusia).

Key words: governance; network analysis; olive oil; organic agriculture; Spain.

Subjects: economy and rural development; vegetal productions.

Résumé

Dispositifs institutionnels et gouvernance dans une filière territorialisée : le cas de l'huile d'olive biologique dans la Sierra de Segura (Andalousie)

Cette communication traite des processus qui régulent les transactions entre entreprises, en mettant l'accent sur les formes de coordination. Dans des réseaux stables, les échanges se font grâce à la présence de certains facteurs sociaux, comme la confiance ou la réputation, qui permettent de clarifier les attentes des parties impliquées et réduisent les coûts de transaction. Dans ce cas, le capital social représente la forme de coordination qui rend possible des telles relations. Pour prouver cette hypothèse, nous avons analysé le réseau de relations sociales et économiques dans la chaîne d'approvisionnement de l'huile d'olive biologique dans la Sierra de Segura (Andalousie).

Mots-clés : agriculture biologique ; analyse de réseau ; Espagne ; gouvernance ; huile d'olive.

Thèmes : économie et développement rural ; productions végétales.

The aim of the current paper is to focus on the processes that rule transactions among firms, specifically highlighting coordination forms. According to neoclassic economic theory, the exchange between individuals suddenly changes their personal ties, so that social dispersion is a requirement for the

perfect market. The partners involved in the exchange process are bounded by strength relationships. Changing suppliers and customers, they try to avoid situations of dependence and to take advantage of new actors (newcomers). Exchange is instantaneous, ruled by the price (spot exchange) and comprehends

all the information for a right choice, so that it is not necessary to investigate social relationships. If specific resources are exchanged over time through iterated relationships, it is necessary to draw up contracts to preserve the efficiency level of transactions, and thus hierarchy becomes the coordination form that rules the exchange. On the other hand, in stable social networks the exchange occurs because of some social elements, such as trust and reputation, which have a good influence on forming the expectations of the parties involved and on audit cost reductions (Dore, 1983; Gerlach, 1992). In this case, social capital represents the coordination form that enables such relationships. To prove this statement we analyzed the network of socio-economic relationships in the organic olive oil supply chain in the Sierra de Segura (SdS) in Andalucía¹.

Governance and institutionalization of economic relationships

At present there is wide agreement among scholars linking governance with the network idea.

In particular the New Economic Sociology (NSE) assumes the network to be an alternative model to the market and hierarchy, considering itself as an “archetype” with its own identity characterized by the presence of informal coordination and based on mutual collaboration and trust, both in the bargaining context (firm belief in the observance of the rules), in abilities (confidence in others’ ability) and, finally, in motivation (Powell, 1990; Hakansson, 1982; Hakansson, 1992). There are two hypotheses at the basis of

this approach: the first one assumes that the need of exchanging goods is a key factor in explaining the existence of relationships among firms. The second hypothesis presumes balanced resource distribution inside the net, in a way to avoid unbalanced power locations (like monopoly in owing resources) that could cause the net to collapse and result in transactions ruled by the market (through the price) or by hierarchy (through control and obedience).

In our opinion, NSE offers the most interesting contribution through its ability to explain connections that bind governance, network and social capital. The encompassed mechanism is called “mutual adjustment”. It posits the creation of relationships based on the principle of reciprocity: the resources that each actor can use are the result of the acting of another actor and *vice versa* (Lazzarini *et al.*, 2001). Consequently, each actor mutually depends on the choices and actions of the others, implying spontaneous and jointly-undertaken solutions to resource management (governance), rather than intentional solutions (Powell, 1990). The key factor that eases such spontaneous governance is precisely the mutual adjustment which represents the background of past relationships. Past relationships are important to building a stable environment for future relationships since they can reveal information about partners’ performance and behaviour, and they can allow the performing of both joint understanding processes (Powell, 1990), and interpretation of reality (cognitive maps). The NSE thus relies on the process of mutual adjustment to locate, in the social capital, the tool of governance of relations under the hypothesis that the distribution of resources (and then of power) between the actors is well balanced or, in other words, that the dependence of each actor on the others is balanced by relationships of reciprocity.

However, studies that apply the idea of social and relational capital to marketing relationships, in terms of trust, have pointed out that power imbalance could allow some actors to control most of the resources (or those considered strategic), exploit their position and then display opportunistic behaviours (Hallen and Sanstrom, 1991). The strength of the “political feeling” embedded in the relationships, thought of as the degree of asymmetry in the distribution of resources and power, can influence the actors’ acting and expectations, being the

main bases of opportunism (Zukin and Di Maggio, 1990).

The model just explained, that is based on the NSE approach and on the study of governance inside nets, can be summarized as follows:

- the behaviour and expectations of the firms are determined by the sociological and political context in which they operate;
- the social context of reference consists of the network of relationships based on the principle of reciprocity that, through the unintentional action of actors (firms, organization, individuals), produces social capital;
- the relational network is ruled by social capital and in this case the actors have cooperative behaviours;

The object of the analysis is therefore the relational network, which contains different kinds of organizations.

The target of this research is to verify the validity of the model by applying it to the relational network, the core of analysis. Using the tool of Network Analysis, we have examined horizontal relationships used by organizations to exchange non-material resources (information, knowledge), and the vertical relationships used to exchange material resources (goods) (Lazzarini *et al.*, 2001). In doing so, we seek to highlight how, in the presence of mutual relationships, the generated control scheme is social capital.

Methodology

Network Analysis

To check the theory of the model given above we adopted Network Analysis (NA), a method consisting in mapping and measuring flows between groups, organizations, individuals, computers and any other entity of information/knowledge (Barabasi, 2002).

NA can be set up on two possible levels: the first focuses on ties to measure the relationships among the actors; the second one focuses on actors (nodes) to measure relationships between “egos” and “alters” inside the net. It is important to explain as these measures are not a single actor’s attributes, but rather relationships that are modified with the changes of ties in the net.

NA, moreover, can be carried out according to two different methodological approaches: structural and relational. The former is based on the idea that two

¹ The Sierra de Segura area covers 193.419 hectares. Like most of Andalusia, it underwent a demographic haemorrhage that reduced the population by almost one half. Actually, apart from tourism, most of the income derives from exploitation of woods and agriculture: olive growing and breeding. The area covered by organic olive growing amounts to 1.403 hectare against the 41.289 covered by the conventional olives trees. The entire olive oil production is certified by the Organic Agriculture Committee of Andalusia that holds the monopoly of certification.

actors have the same behaviour if they occupy the same position in the net. Hence, the focus is on the structure or, better, on kinds of structure inside “ego” networks. The relational approach gathers the actors according to the frequency, intensity, strength and weakness of their ties. In this case we are interested in resources that pass through the ties and that can be used by actors to reach their goals.

The method is based on two representations of the network: a matrix-based representation and a graphic-based one. In the former each relation is represented by binary values: 1 for the presence of relation, 0 for absence. It allows quantitative and qualitative determinations by sociometric and descriptive indexes obtained by matrix calculations. Indexes provide a lot of information such as network density, distribution, presence of groups (called cliques) and isolated nodes.

Density

This index describes the whole network and it is obtained by dividing the number of the existing ties by the number of all possible ties in the net. It provides an idea of how far a network is from its maximum potential.

Standard deviation

This index measures how “scattered” and distributed the ties are inside the overall network. It explains how much variability there is among the nodes. In extreme cases, that is when each actor is isolated or when all the actors are bound to each other, the standard deviation would be zero. As binary data is used in the treatment, the maximum possible value is 0.50.

Centrality

The idea of centrality starts from the assumption that it is possible to order a group of actors (nodes) bound by ties into a hierarchical scheme depending on their position inside the detected structure of the network. In theory, actors who occupy a central position have a wider potential access and control over strategic resources. Actors capable of controlling such resources are then able to increase the dependence of the others, thus acquiring power. Hence, in the centrality measure here three variables are involved: degree, closeness and betweenness.

By *degree of an actor* we mean the number of his relationships. Some authors consider an actor as central if close to the others in the net (Katz, 1953; Sabidussi, 1966; Czepiel, 1974; Burt, 1982; Bonacich, 1987). A high degree of centrality gives us an idea about the communication ability of an actor: he will control more resources and gain more prestige, status, power and influence. Several studies have demonstrated that the degree of centrality of “ego” nets is related with power (Burkhardt and Brass, 1990; Brass and Burkhardt, 1992; Brass and Burkhardt, 1993). The index that expresses the actor's degree is Freeman's centrality degree (Freeman, 1979).

The term *closeness* is related to the amount of ties more or less directly owned by an actor: the more direct they are, the more influential the actor. The index is Freeman's *Closeness Centrality* and it expresses the actor's distance from the others as the reciprocal of the sum of his geodesic distances. An overall measure, expressed as a percentage of the same measure for a same size star network can be also computed.

Betweenness is that quality that usefully describes the structural advantage of an actor: it refers to actors occupying a position between two or more individuals, which affords choice opportunity and ability to exert will. The index used for this measure is Freeman's *Betweenness Centrality*. It identifies an actor as being favoured by falling on the geodesic path between other pairs of actors. Occupying this position means, in practice, that the connections between these pairs depend on the actor who holds it (Friedkin, 1991).

Finally the ideas of closeness and betweenness, since they are based on the possibility to access (closeness) and to control (betweenness) useful resources, are equivalent to the idea of dependence by resources and, hence, of power (Brass and Burlhardt, 1993).

Identification of network, location of actors and relationships

The approach used in setting up the survey is the structural one. This choice descends from the aim to find, among the organizations along the supply chain, only opportunistic behaviours coming from the power position, or cooperative behaviours due to the presence of social structural capital. In both cases the

behaviours are deeply rooted in the net and, when power distribution is well balanced, they are the consequence of repeated and unintentional reciprocal interactions. Holding these conditions, they tend to become institutionalized stable models of actions, or social structures (Barley, 1990). In order to emphasize the roles covered by the organizations inside the supply chains, we decided to use indexes which could measure the “ego” network and that could also consider the high number of actors involved. To depict the network it was necessary to list all the actors involved as thoroughly as possible and to map the relationships among them. In this phase of the project we chose a double approach, both positional and reputational (Scott, 1991). We then preceded with interviews of a sample of different kinds of stakeholders, men known to have a great deal of knowledge about the network. With their help it was possible to reduce the number of actors and to compile a questionnaire later submitted to the actors. The aim of the survey instrument was to register all the aspects tied to the roles played by the organizations in terms of collaboration, prestige, and power. The interviewees could choose among four kinds of relationship: commercial, exchange of information, brokerage and partnership. For each actor we asked about the presence or absence of relationships with the others and some further details. Before submitting the questionnaire, therefore, each actor was interviewed to describe his activity in the network, his vision of the supply chain and other useful information. For the mathematical data processing we used a special program – Ucinet version 6 – and for the graphs the Netdraw software.

Finally, we had twelve interviews resulting from a network of 57 actors. The differences between the number of interviews and the number of actors do not invalidate the analysis. It was not necessary to interview all the actors to build the net, but only those suggested as being strategic by the preliminary interviews. It is easy to understand that it would not be useful, for example, to interview institutional actors that have only limited influence on the structure and development of the network.

Relational survey

From the index analysis of the organizations in the supply chain (*table 1*), we can

Table 1. Network measurements assigned to individual actors inside the Sierra de Segura.

Tableau 1. Mesures du réseau attribuées aux acteurs dans la Sierra de Segura.

Type of measurement	Values
Number of actors	57
Mean	0.7
Standard deviation	0.4
Freeman's Betweenness	2.6
Network Centralization Index (%)	3.7
Norm Out-closeness	86.4
Norm In-closeness	86.7

point out the following considerations. The means is 0.7 while the standard deviation is 0.4. The former index highlights a high value in "relational effectiveness" in the Sierra de Segura, while the standard deviation indicates higher uniformity. The investigation of centrality provides, first of all, the Network Centralization Index, which measures in percentage the similarity with a highly centralized star-shaped network. This value is 3.7%, denoting the absence of centralized organizations inside the supply chain, and then the presence of "equity" in the relationships which are shared among all the ties of the net.

The index that measures the betweenness degree among organizations (Freeman's Betweenness Centrality), strengthens the previous considerations: almost half the stakeholders exceed the average value (which, normalized for the network, amounts to 2.6). Hence, most of the organizations share strategic relationships such as information, knowledge, trust, and reputation.

The Closeness Normalized Index (Norm Out-Closeness and Norm In-Closeness) does not go far from the previous trend, taking a high value. The organizations inside the Sierra de Segura have no mutual power influence and, moreover, they can reach the others with a lower number of steps. The equality in out-degree and in-degree uncovers the presence of a strong reciprocity between the organizations.

The network of the SdS is quite simple: few public organizations and agencies are involved but, as the value of the indexes shows, they have a very important role in spreading resources towards all (or almost all) the organizations.

Among the three certification institutions only one stands at the margins of the network while the others hold a central position. There are two category associations – one against the organic sector – both of which are very active and central. As a result, the network of the SdS is compact and rich in relationships. Institutional stakeholders, with some exceptions, effectively spread know-how and competence, and they interface with the whole sector. There is good participation, the choices are discussed and the "organic feeling" is shared and felt by almost all the stakeholders. The few co-operatives, and in particularly the only one dealing with the market, do in fact represent a strong hierarchical element. However, no lobbies can be found exerting a resource centralization coercive power, although such a compact network can represent an obstacle to the constitution of different organizational dynamics in the supply. The large scale presence of stable reciprocal relations between the firms integrated in cooperatives arising from a strong feeling of membership to the rural community (which is itself a typical mechanism of mutual adjustment based on repeated interactions), have made the socialization of strategic activities such as decision-taking and problem-solving easy. This situation creates the bases to develop relational-based social capital that, in the absence of unbalanced power, hinders the emerging of opportunistic and conflictual behaviours. It also constitutes a control mechanism for non-contractual relationships based on vertical integration which facilitates a fair distribution between the economic actors of added-value from sales of the bottled product. There is evidence of a growing trend in the premium price paid to the cooperative, in spite of the contemporary increase in the production sector.

Conclusion

This work focuses on theoretical issues about socio-economic relationships which undoubtedly deserve more investigation. A special effort was made to debate the idea that the market is a socially empty space where atomism and opportunism are the only elements to explain the exchange relationships between firms. Many recent studies, especially thanks to the NSE, have shown that economic transactions are led by

social capital instead of by the market. From this point of view the net represents not only a metaphor used to describe the growing complexity and activity of the external environment, but an alternative tool to that of the market and hierarchy which makes it possible to organize economic activities in other forms. The crucial element from the socio-economic perspective is the collective action of the firms that needs to be embedded in a stable context of social relationships.

Obviously treating this question is not easy because of the difficulty in harmonizing different concepts referred to with the same name but given different meanings. Plus, there is a loss in methodological rigour due to the lack of analytic tools capable of explaining the complexity to be challenged. In the final analysis, however, we believe this to be the right way to proceed to improve the knowledge of reality and bring it to a higher level. ■

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