



Temporary project network and innovation: research on the Italian regional wine industry

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Abstract

Purpose – This study aims at exploring the characteristics of the Temporary Project Networks (TPNs) in small and medium-sized wine producing enterprises, both from a theoretical and an empirical perspective. It aims to discuss different types of temporary inter-firm collaboration clusters both in terms of structural/organizational features and in terms of innovation tasks development. It also aims to develop an empirically derived taxonomy of TPNs within the Sannio wine industry.

Design/methodology/approach – The paper focuses on the literature supporting the argument that the act of innovating is related strongly with the creation of new knowledge. In particular, the knowledge-based theory places primary emphasis on inter-organizational knowledge exchanges in explaining enhanced knowledge creation toward better innovative outcomes. The design of forms of coordination between companies is investigated with reference to TPNs, a form of collaboration that has been less investigated in the literature, especially with respect to small to medium-sized enterprises (SMEs). The survey concerned 40 SMEs operating in wine production in Sannio, one of the most promising areas of the Campania region and the entire Italian economic system. The research is based on the use of different quantitative instruments (administration of structured questionnaires and statistical analysis) and qualitative instruments (semi-structured interviews of management, analysis of information material, reports as well as planning documents of the companies involved in the analysis). A cluster analysis has been carried out to identify TPN typologies.

Findings – The study finds that the different kinds of inter-organizational collaborations lead to two-cluster solutions that refer to two of the TPNs models formalised by Bakker *et al.* The findings add to the view that there is variation in types of project network and go against the often held idea that temporary projects are by definition short-termed and focused on non-routine tasks.

Originality/value – The study was able to expand the understanding of TPNs and innovation in two respects. First, it should be noted that only a few studies have adopted the TPN framework to investigate the inter-organizational coordination mechanisms among SMEs. This study could usefully find its place in this literature gap, thus contributing to develop a typological research in order to identify TPN clusters with homogeneous distinctive characteristics. Secondly, the study has an explorative role of analysis, which can be useful for generating research hypotheses in future works, connecting the features of TPNs with the development of innovation processes.

Keywords Temporary project networks, Knowledge creation, Innovation, Inter-organizational relations, Wine industry, Wines, Italy, Knowledge management

Paper type Research paper



1. Introduction and aim of the paper

In management literature a growing interest towards topics on design of those types of inter-organizational coordination finalized towards the creation of value through product and process innovation development (Huston and Sakkab, 2006; Ahuja and Katila, 2001). A gradual refocusing of research on factors external to the organizations (instead of the internal ones) can be noticed by analysing the most recent contributions to the literature on the key elements of the different types of organizational innovation, ascribable to the development of network studies (Ahuja, 2000) and more specifically, those on clusters of small- and medium-sized enterprises[1] (SMEs) (Baptista and Swann, 1998; Saxenian, 1994). Innovation networks are of growing importance in the knowledge based economy, in which no single organization has access to all the knowledge necessary to innovate (Lundvall and Barras, 1997). In particular, the knowledge-based theory places primary emphasis on inter-organizational knowledge exchanges in explaining enhanced knowledge creation toward better innovative outcomes (Arikan, 2009). According to this approach, the creation and the governance of organizational networks and the inter-organizational coordination are interpreted as the key elements for knowledge development (Tushman and Nadler, 1986).

As far as the value creation path of agricultural organizations is concerned, the analysis of the literature shows that they are based on opportunity gap expectations related to the boundary shift realized through diversification processes along three different directions: deepening, broadening and regrounding[2] (Van der Ploeg *et al.*, 2002). In the light of this model, new forms of value creation in agricultural organizations and their capability of process/product innovation have application and socio economic effectiveness limitations. These limitations can be overcome through the creation of both long-term partnerships and agreements on specific innovation projects with a time limitation.

In this work, the design of coordination methods between companies as a potential generator of innovation processes is investigated within a localised cluster of SMEs (Porter, 2000), and with reference to a type of collaboration that has been less investigated in temporary project network (TPN) literature.

This study aims at exploring the characteristics of the TPNs in small- and medium-sized wine producing enterprises, both from a theoretical and an empirical perspective. As a matter of fact, we will discuss different types of temporary inter-firm collaboration clusters (Bakker *et al.*, 2009) both in terms of structural/organizational features and in terms of innovation tasks development. The dimensions of TPNs described and analyzed in our work, are used as the starting point for the development of an empirically derived taxonomy of TPN within the business system studied. The survey involved 40 SMEs operating in one of the six sub-systems in which the agribusiness is divided in the Campania region – the Sannio wine industry.

The paper is organized in the following manner: in Section 2, our theoretical framework is illustrated, focusing on the relationship between knowledge creation and innovation processes in the wine industry (Section 2.1); and on the features and the taxonomy of TPNs (Section 2.2). In Section 3, the research methodology is described. In Section 4, the empirical results relating to the Sannio industry are provided. Finally in Section 5 the empirical results and our conclusions are explained and discussed.

2. Theoretical framework

This section consists of two parts: in the first we focus on the organizational literature dealing with relationships between knowledge creation/exchange and innovation

processes in the wine industry (Section 2.1). In the second, the TPN concept is interpreted through the taxonomies developed by Lundin and Söderholm (1995) and by Bakker *et al.* (2009), illustrating how the variance in systems among TPNs, as determined by the different dimensions in which the taxonomy is structured, may be interpreted as a crucial premise regarding the ability to develop effective processes of product and process innovation.

2.1 Knowledge creation, networking and innovation in the wine industry

There is significant literature supporting the argument that the act of innovating is related strongly with the creation of new knowledge. In particular, scholars from the network and inter-organizational relationships fields have argued that the concept of knowledge exchange among firms is strictly linked to innovation process (Liebeskind *et al.*, 1996). Henderson and Clark (1990) suggest that firms need to develop and renew their architectural knowledge continually to prevent knowledge from becoming obsolete in the event of radical innovation. The work of Nonaka and Takeuchi (1995) regards knowledge creation as the core of innovation.

The concept of innovation has been deeply transformed in economic and managerial literature in recent years (for a complete taxonomy of the main definitions see the work of Quarantino and Serio (2009)), arriving at the concept of open innovation defined by Henry Chesbrough (2003). Nonaka (1994), for example, suggests that innovation can be conceptualized as a process in which an organization creates and defines problems and then actively develops new knowledge that can be applied to solve these problems. West and Farr (1990) define innovation as the intentional introduction and application (within an organization) of ideas, processes or products, new to the relevant unit of adoption, designed to significantly benefit the organization or wider society.

In traditional industries, like the wine industry, innovation strategy could develop carrying out radical innovations based on creativity in managing interdependencies between technologies (e.g. techniques for grape cultivation, industrial design, winemaking scheduling), and semantics (symbolic, cultural and emotional values, etc.). Designing a new wine, for instance, means not only coming up with new technical features (e.g. improvements in organoleptic performances), but also generating new product meanings (e.g. wine as a social experience or associated with travelling in a specific region) (Bellini and Dell’Era, 2009).

As innovation is such a complex and uncertain process, it usually requires input from a range of external sources – frequently through inter-organizational collaboration (Dodgson and Rothwell, 1994). A growing body of innovation research has shifted its focus from a single innovator to a network of actors (Van de Ven, 2005). In the network literature, it has almost become an axiom that inter-organizational networks lead to more innovation (McCann and Simonen, 2006). The theory of innovation networks (Pyka and Küppers, 2002), for example, adopts a broader view on innovation. Innovation networks are interpreted as a new form of organization within knowledge production: they support inter-firm learning, complement the firm’s own resources through interaction with other actors and open up the possibility of the exploration of synergies by combination of different competences. Innovation networks are defined as “interaction processes between a set of heterogeneous actors producing innovations at any possible aggregation level (regional, national, supranational)” (Pyka and Küppers, 2002, p. 169).

The theoretical emphasis on collaborative mechanisms to improve innovation levels among actors has been followed up empirically. Studies such as those by Van der Ploeg *et al.* (2002) have demonstrated the importance of external linkages in the agricultural industries, and such studies have found that numerous innovations have been developed on the basis of collaborative linkages. While they did not set out to study the effect of collaboration on innovativeness and the source of these innovations, it is likely that high levels of collaboration lead to high levels of externally stimulated innovation. Bell and Giuliani (2007), referring to the Italian wine industry, suggest that an innovation networks are shaped by the firms' knowledge sharing.

Given that cooperation involves the deliberate partnering of firms through which durable exchange, sharing, or co-development of new services, products and/or technologies can take place (Gulati, 1995), it is reasonable to expect that higher levels of collaboration will lead to firms with high levels of collaboration being more innovative and that these innovations will primarily be externally stimulated.

Summing up the above discussion, the literature suggests that inter-organizational cooperation could provide a common pool of resources, opportunities for knowledge flow, and stimulus for innovation (Liu, 2011).

In this paper, the design of forms of coordination between companies as a potential generator of innovation processes is investigated with reference to a form of collaboration that has been less investigated in the literature: temporary partnerships between companies, and TPNs in particular.

2.2 Temporary project networks taxonomy and innovation development

In temporary organisational systems, independent and inter-dependent entities cooperate for a limited period of time to achieve specific objectives (Miles, 1964; Goodman and Goodman, 1976). When these goals are completed, the project organization literally dissolves. The relative importance of these temporary systems in the economy is often said to be increasing (Grabher, 2004) and, at the same time, there has recently emerged a small, but growing body of literature that studies temporary collaboration between organisations (Jones and Lichtenstein, 2008).

The phenomenon studied here therefore does not represent something new in itself. However, Grabher (2004) has noted how it recently has become quite important in the international economic system. Several empirical studies also show how temporary systems, and inter-organizational projects in particular, are developed by actors working together in networks that have similar characteristics in terms of systems and relationship processes (Jones and Lichtenstein, 2008). From this point of view, temporary systems will be interpreted and analyzed as organizational structures in their own right.

More than a few studies consider mechanisms of knowledge-sharing in temporary organizations. Rutten and Oerlemans (2009) claim that temporary organizations represent an effective means to integrate different types of knowledge (tacit and codified) and skills and to cope with risks and uncertainties related to complex activities. Fong (2003), studied knowledge creation processes in temporary organizational systems and described knowledge creation as an interwoven and boundary-crossing process of knowledge exchange, knowledge-integration and knowledge creation. Koskinen (2004) focused on the role of tacit knowledge versus explicit knowledge in a project context. Finally, Adenfeld and Lagerström (2006) investigated the role of different

enablers (such as structure, culture, and ICT) of knowledge creation and sharing in intra/inter-organizational projects.

The nature and methods requested for regulation of internal transactions and coordination mechanisms within a temporary system can vary according to the type of activity, and in relation to the stability of the role played by a particular player or the level of standardization of the processes/products implemented. The concept of temporary systems includes organizational forms such as R&D projects, surgical teams, emergency response teams and/or TPNs. In this sense, TPNs belong to the broader class of temporary organisational systems.

The concept of TPN is derived from the creative industries (such as television industry) (Grabher, 2002), where collaborating actors maintain longer-term relationships which are actualized and institutionalized through specific projects; but they have been defined as a distinct and classifiable organizational form for other project-based industries as well (Romanelli, 1991). Therefore, TPNs may be interpreted as types of temporary organizational systems composed of independent companies whose creation and development process is associated with the completion of a project (Sydow *et al.*, 2004). In the same way, Manning (2010) suggests that the project networks are strategically coordinated sets of longer-term project-based relationships between legally autonomous actors. In other words, these structures are project-based organizations (Hobday, 2000), where the focus on specialisation is secondary to an emphasis on strategy, structures and competences that may best satisfy the needs of a project and which go beyond the normal boundaries of individual companies and the sectors of industry they belong to. The project-based organization is found when complex, non-routine tasks require temporary employment and collaboration of diversely trained specialists.

The capability of realising innovation, even in competitive conditions characterised by a high level of complexity in relation to products and technological systems (Gann and Salter, 2000), as well as organisational inertia (Bresnen *et al.*, 2004), is linked to these cooperative types of structures. Studies of this subject have shown how very often the success of innovation initiatives depends on the ability to share different core competences in managing inter-firm projects that can be easily defined as a co-innovation effort (Chiaromonte, 2002).

Several authors have analyzed other criticalities and weaknesses in temporary systems which could also manifest themselves if this type of structure is used at network level: a weak focus on efficiency and economies of scale (Hobday, 2000), a marked difficulty in extending learning processes from one project to the next (Prencipe and Tell, 2001). Analysis of these criticalities shows that the recourse to these types of organisational structures requires the implementation of management systems and organisational solutions that are particularly useful in strengthening learning processes when the cooperation between companies is no longer occasional but is instead repeated over time.

Two studies offer an interesting theoretical and methodological design to analyze the concepts presented above. First of all, the study by Lundin and Söderholm (1995), referring to temporary systems, identified four main project dimensions: time, team, task and transition. These four concepts:

[...] help to clarify the general demarcation of the temporary organization, and each one provides some insights into the way various types of boundaries between the temporary

organization and its environment can be defined (Lundin and Söderholm, 1995, p. 439). Moreover, this study has been discussed and integrated by Bakker *et al.* (2009), who, on the basis of an analysis which converges with other studies, propose to replace the transition concept with that of context (Goodman and Goodman, 1976). They specifically study temporary inter-organizational collaboration in the form of TPN.

In relation to time, TPNs differ in terms of duration which, if sufficiently long, permits the development of personal relationships and mutual trust which are developed in other longer lasting organisational structures (Meyerson *et al.*, 1996; Sydow *et al.*, 2004). According to relevant studies TPNs are little connected to the development of innovation process: as a matter of fact projects and temporary systems have, generally speaking, a short-term orientation. Besides, many scholars agree with the fact that successful knowledge transfer requires long-term orientation.

The two most significant dimensions in terms of the team system that lead to different typologies of TPN can be found in the size variable, which is understood as the dimension of the group of organizations that participate in the temporary system, and in the legal entity variable, in other words the possible recognition of a specific autonomous legal status for the project team. With reference to this second factor, Whitley (2006, p. 79) points out:

[...] when temporary project networks are imbued with a legal status, it receives distinct legal and financial powers and responsibilities. [...] they are then legally constituted collective actors that control property rights and exercise formal authority over task organization and performance through employment contracts. As far as concern the relationship between stable settings, development of knowledge management and innovation process, many authors point out that projects and temporary forms of organising and, as a consequence, TPNs represent a challenge for project knowledge management. In particular, referring to the team dimension only continuous team composition can be associated to construction of organizational knowledge (Lindner and Wald, 2011).

The third variable of the taxonomic modelling is the task. Boh (2007), who developed four knowledge-sharing mechanisms for distributed knowledge in temporary organizations, claims that the selection of the mechanisms depends on the nature of the problem (unique, repetitive). The binary option “uniqueness vs repetition” (of objectives) is the criterion typically used to decline different forms of TPN related to the variable task. In the opinion of Bakker *et al.* (2009), it is problematic to view temporary systems as systems dealing only with unique tasks. Furthermore, Lundin and Söderholm (1995, p. 441), declare: “when a temporary organization is assigned a repetitive task, the actors know what to do, and why and by whom it should be done”. It is worth to underline the importance of dealing with repetitive tasks in order to develop organizational routines connected with organizational learning (Bresnen *et al.*, 2003; Fong, 2005). In addition to this Bakker *et al.* (2009) consider another important dimension of the task: the budget which represents a constraint for the project. Its size can affect the task development and its management.

The fourth variable mentioned by Bakker *et al.* (2009), is the context. The general issue related to context is related to the impact of the external environment on work processes associated with project implementation. From this point of view, one important way in which the context determines variations in identifying different typologies of TPN is the existence of pre-existing links (prior ties) between the organizations. In fact, the project network may be part of longer term collaboration.

Jones and Lichtenstein (2008) look at this dimension as the degree of social embeddedness of a TPN. Under this respect, it is an important variable since it is linked to elements such as experience, trust, reputation. As the scholars highlight, when exchanges evolve from one-off, single interactions to repeated and durable long-term relationships “that facilitates coordination and guides collaborative activities among organizational actors” (Jones and Lichtenstein, 2008, p. 233). Another dimension which indicates the variation between different types of projects networks is the project-based mode of operation, which represent the possibility of develop “project capabilities”.

By comparing the four factors identified in a big study on small and medium size companies, Bakker *et al.* (2009) indentified six types of TPN (Table I).

Consistently with the approach of Bakker *et al.* (2009), the dimensions used to analyze the distinctive features of different types of TPN are:

- (1) the project duration;
- (2) the size of the project network in terms of the number of participants;
- (3) whether the network is granted to separate legal status;
- (4) the uniqueness of the project network’s tasks;
- (5) the size of the budget awarded to the project network;
- (6) the extent to which there are prior ties between the parties involved; and
- (7) the project-based mode of operation.

The last dimension proposed by Bakker, the business sector, is not considered in our analysis because all companies operate in the same sector.

These seven dimensions are, therefore, the reference points of our fieldwork, and constitute the starting point for the development of an empirically derived typology of TPN within the business system being studied (Section 5). A specific focus of analysis within this taxonomy is dedicated to innovation created by these temporary systems.

We have already seen that within the context of TPNs, parties cooperate with several external parties for a certain period of time to finish a project and within this period of time they can create innovative ideas (Bosch-Sijtsema and Postma, 2004). This means that, on the one hand, there is a growing recognition that TPNs can bring about benefits for innovation (Nooteboom, 2000): these benefits are obviously related to the duration of the project, the number of participants in the project itself, degree of

Type	Description
Type I	Small one-shot exchange networks of extremely short duration with no prior ties between them
Type II	Informal project networks with highly unique tasks and relatively few prior ties between them
Type III	Small budget project networks of short duration, highly embedded in prior ties between partners with no project-based mode of operation
Type IV	Formal, large budget project networks of extremely long duration
Type V	Large size, large budget project networks of long duration solving routine tasks
Type VI	Small, informal project networks highly embedded in prior relations between project-based enterprises, taking on routine tasks

Table I.
A taxonomy of TPNs

Source: Adapted from Bakker *et al.* (2009)

formalization of the collaboration (legal status), existence of previous collaborative relationships between the companies, the repetition of tasks, the use of project management. All these factors affect, among other things, the possibility of developing common strategic visions and specific skills. Moreover, the existence of prior ties, also labelled as the “shadow of the past”, is often regarded as an indicator of the development of trust between partners. On the other hand, there is also growing awareness that potential risks might be associated with TPN: for instance, the contradiction between the short-term task objectives of a project and the longer-term development nature of organizational learning processes (including innovation processes) (Bosch-Sijtsema and Postma, 2004). TPNs, in fact, could be one-off, self-contained tasks, which have specific objectives, finite life cycles and dedicated teams. Thus, several authors state that discontinuities, which are created between inter-organizational projects in tasks, personnel, resource and information flows imply that knowledge and learning from one organization cannot be easily transferred to another organization (Prencipe and Tell, 2001). Particularly, Littler (2006) shows how the hypothesis of cooperation in TPNs aimed at innovation, itself represents a paradox, if the TPN involves a limited budget and/or firms without previous experience of collaboration, and/or without a separate legal status, and/or with short term objectives.

In other words, although TPNs are beneficial for innovation, they have a number of potential weaknesses: they are weak in performing routine tasks, achieving economies of scale, facilitating company-wide technical development and promoting organisation-wide learning.

3. Methodology

The wine industry represents an interesting case for analyzing the process of knowledge creation and innovation. In the past decade, the international wine industry has been characterized by a very rapid growth of exports and by the emergence of new wine producing countries and their entry into the global market. Wine producers are currently affected by a global slowdown of wine consumption and by increased competition, and this has spurred them to intensify their efforts to improve product quality and to enter higher value niches in international markets. So, the wine industry has been involved in a deep process of technological innovation within which science and investigation have taken on a much more significant role. This industry has undergone significant advances in production processes, involving scientific improvement in the practices of wine production.

As we said, we aim to develop an empirically derived taxonomy of TPNs within Sannio wine industry. For this purpose, method used consists of an empirical quali-quantitative survey able to represent different relationship typologies and the mechanisms used to manage them in a project-based network.

The survey concerned 40 SMEs operating in one of the six sub-systems (*filiere*) of agribusiness in the region Campania: Sannio wine production. In view of the great fragmentation of the productive units, the Italian wine industry, above all in the south of Italy, is characterized by a massive presence of SMEs.

The analyzed business population represents all the companies in the production chain of the Sannio wine industry with more than ten employees. This cut-off level, excluding smaller companies with a structure that is “too” simple, reflects the need to

consider companies with at least some organizational complexity and able, at least potentially, to develop innovation oriented project ideas.

The sector chosen to carry out the survey chosen on the basis of three contingent factors:

- (1) The increase in the number of guaranteed quality regional products (DOP, IGC, etc.) recognised by the EU compared with the national average in the last five years.
- (2) The significance of the value of regional agricultural production in terms of employment.
- (3) The amount of public (regional and community) financial resources invested in the agricultural sector (compared to other regional economic sectors) supporting the organizational innovation of cluster firms (TPN). Moreover, by focusing on companies located in the same region we avoided having to take into account the strong impact of territorial differences on wine production and managerial behaviour.

To determine whether there are different types of inter-organisational projects, we made use of dimensions of temporary organisations as proposed by Bakker *et al.* (2009). A semi-structured questionnaire was filled in by each enterprise. A follow-up interview was carried out in the enterprises which stated a positive result in terms of innovation projects. The aim of the interview was to verify the correspondence between our data and the theoretical model of Bakker *et al.* (2009) and highlight other features of the temporary inter-organizational cooperation, which determined the success of the innovation project.

The measurement of the dimensions identified by the Bakker *et al.* (2009) model was carried out through questions, listed in Table II, taken from the survey questionnaire.

All aspects investigated were entered into a cluster analysis (Vermunt and Magidson, 2002). Kaufman and Rousseeuw (1990) define cluster analysis as the classification of similar objects into groups, where the numbers of groups, as well as their forms are unknown. A similar definition is given by Everitt (1993) who speaks about deriving a useful division into a number of classes, where both the number of classes and the properties of the classes are to be determined. Cluster analysis is a purely empirical method of classification and as such is primarily an inductive technique: accordingly, it seems coherent with the purpose to define an empirically derived taxonomy of TPNs within the regional wine industry.

4. Sannio wine production

In the Nineties the Italian wine industry experienced a qualitative growth in production: despite a decreasing domestic consumption (Bellini and Dell'Era, 2009). The Istat data from 2009 revealed a production of 4.54 billion litres, with a 30 per cent growth in volume. Exports grew by 50 per cent.

The Campania region is one of Europe's most innovative winemaking regions. The last three decades have seen a dynamic resurgence in Campania and distinctive wines have popped up in many provinces, bringing the DOC denominations from nine in 1975 to 19 by the end of 2009. Currently, Campania represents one of the regions with major potential: with three Denominazioni di Origine Controllata e Garantita (DOCGs) (controlled and warranted designation of origin) and 19 Denominazioni di Origine Controllata (DOCs) (controlled designation of origin). However, the data given in a

Section A – project duration (time)	(1) How many weeks were required in order to carry out the overall project objectives?
Section B – team size (team)	(1) How many independent organizations make up the project team?
Section C – legal status (team)	(1) Was an independent entity created for the execution of the project? (2) With what tasks? (A) Legal representation (B) Operational coordination (C) Planning, management and monitoring of project activities
Section D – budget (team)	(1) What was the planned budget for the achievement of the project?
Section E – task	(1) What was the scope of the project? (A) Create goods and services already present and created in previous collaborations (B) Innovate some technological and/or organizational jointly adopted solutions (C) Develop a new generation of goods or services already present and created in previous collaborations (D) Develop new goods and/or services (2) Did the project produce patents or licences? (3) Did the project lead to national or international quality certification?
Section F – prior ties (context)	(1) Have the companies members of the project team previously collaborated in other projects or in the performance of specific transactions? (2) How many of the member companies were involved? (A) All (B) Approximately half (C) Some (3) The scope of these collaborations was (A) Exchange of goods and services (B) Projects for the development of new products/services (C) Investment projects (4) How would you rate the intensity of past collaborations? (A) Intense (B) Moderate (C) Weak (5) On average, how many weeks did the past collaboration projects between team member companies last? (6) How many transactions per year are executed between your company and other team member companies on average? (A) Intense (B) Moderate (C) Weak

Table II.
Questions from the questionnaire for the measurement of the size of Bakker *et al.* model

structural survey carried out by Istat (2007) reveal a production structure which is very fragmented: wine making is carried out in companies with an average of little over 3 hectares of dedicated land. The value of wine production in the region in 2008 was about 84 million euro.

Wine is produced all over the region, with a higher concentration in the provinces of Avellino and Benevento. The Sannio region (Benevento), in particular, constitutes alone around 40 per cent of the total of certified regional production in Campania: more than 60 firms bottling over 1,000,000 hectoliters produced every year, one DOCG

(Aglianico del Taburno), six DOCs and two geographical indications (IGT), for more than 60 typologies of wine.

As already said, the 40 organizations analyzed represent all of the companies in the production chain of the Sannio wine industry, with more than ten employees. It is the geomorphologic and antropomorphologic features which can be considered the drivers of the sub-economic development system.

The analyzed companies have an average area of slightly less than 10 hectares, with a positive variation in the used agricultural area of about 51 per cent compared to the start-up year (the mid-1990s). These companies are almost solely dedicated to wine production, with a specialization of 0.96, a clear sign that the production of quality wine is their core business (Table III). Furthermore, over the last five years most of the analyzed companies have implemented boundary shift processes: only one fifth of the companies remain within the traditional core business, without diversifying (Table IV).

In terms of take-up markets, we have seen downsizing in local markets and growing access to international markets, including non-European markets. Regional and European markets maintain approximately the same levels of absorption of company products, while national and international markets have increased in importance: the former going from 12.6 to 15 per cent, and the latter, which did not figure at the start of activities, now accounts for nearly 5 per cent (Table V).

In relation to coordination between organizations, according to the managers surveyed about 60 per cent of revenues derived from activities carried out in collaboration with other companies (long-term contracts) and approximately 30 per cent

Table III.
Some structural data
concerning the companies
analyzed

Average year of start-up	1994
Average age of owners	45
Used agricultural area in hectares (average)	9.46
Variation of UAA compared to the start-up year (%)	51.1
Number of employees (average)	22
Level of wine producing specialization (%)	96

Table IV.
Boundary shift processes

Type of diversification	% of companies
Transformation	47.4
Direct sales	19.3
Tourist activities	10.5
No diversification	22.8

Table V.
Take-up markets

Market	Year activity begun (%)	Current situation (%)
Local	49.7	40.9
Regional	30.2	32.2
National	12.6	15
European	7.6	7.3
Worldwide	0.4	4.6
Total	100	100

through independent legal forms (associations and cooperatives), resulting in joint management of some production processes. In addition, 64 per cent of companies studied have made transactions with the same client organization for more than seven years.

Moreover, according to the interviews, the firms consider collaboration among companies differently according to their diverse aspects (these may also coexist). In 66 per cent of cases success was attributed to the cognitive features (e.g. methods, problem solving, vision and goals, shared values); in 58 per cent of cases success was attributed to the organizational or structural components of the project: long duration and previous collaboration, the validity of the mechanisms of coordination and communication among players in the TPN, the adequacy of typical methods of planning and control of the project management. Finally, in 33 per cent of cases openness and honesty in relationships were considered drivers of success.

With regards to innovation, 61.5 per cent of tested companies have implemented processes of organizational innovation in technology for the past seven years. In 86 per cent of these cases, innovation led to official national (62 per cent) and international (38 per cent) awards. Three results of innovative processes are market expansion (41 per cent), customer diversification (24 per cent) and increased demand (26 per cent). Moreover, 71 per cent of analyzed companies completed innovation projects receiving public co-funding (regional and community) over the past seven years, operating in collaboration with companies that activated stable transactions for more than seven years. In terms of project duration, these lasted approximately two years. In managing these projects, 28 SMBs have been engaged in two different types of TPNs, whose features will be discussed in the last section of this paper. Furthermore, according to the opinions of the managers participating in the survey, in 71 per cent of the cases innovation project success depended on collaboration climate, knowledge among partners and the possibility to share the same knowledge used in the project.

5. Discussion and conclusion

The analysis of 40 companies revealed that two groups of TPNs actually exist in the analyzed business system, and that they represent one of the organizational solutions used to achieve innovation.

The models indicated in our theoretical framework make it possible to explain most of the collaborative experiences in the selected business system. In particular, the different kinds of inter-organizational collaborations lead to two-cluster solutions that refer to two of the TPN models formalized by Bakker *et al.* (2009)[3]: Types 1 and 5. The characteristics of the two types of temporary inter-organizational projects are presented in Table VI.

Type I consists of TPNs of extremely short duration (on average 1.1 years), with relatively small sizes (mostly only two companies) and small budgets (mean: 150,000 euros). An average of 3.3 (team-size) organizations form this type of TPN, and these demonstrate the least prior ties between partnering firms (over 84 per cent were not involved in prior collaboration). Moreover, most of them did not set up a separate legal entity to manage innovation projects. Finally, the majority of this type of project network (48 per cent) accomplished only single tasks. In the majority of projects, tasks were directed to increase efficiency and productivity levels of the SMBs involved, indicating that these temporary projects had objectives

Table VI.
Types of TPN and their characteristics

Characteristic	Type I (<i>n</i> = 16)	Type II (<i>n</i> = 12)
Project duration in weeks (time): average	53.6	165.2
Number of organisations (team): average	3.3	15.2
Separate legal status (team) (%)	20.1	50.2
Uniqueness of the project network's tasks (task) (%)	29.9	79.8
Developing of guaranteed quality products (task) (%)	73.2	11.5
Degree of product innovativeness (task) (%)	47.8	13.6
Variation on existing process (task) (%)	19.3	40.3
New generation of existing product (task) (%)	20.1	49.2
Prior ties (context); yes/no (%)	32.2	67.4
Project-based mode of operation (context)	15.7	68
Budget size – mean, in euros (context)	150,000	320,000

aimed at refinement, improvement and standardization. Only in 20 per cent of cases was the inter-organizational relationship aimed at developing a new product or introducing new processes, typically by means of an upgrade in terms of techniques for grape cultivation and/or an evolution in terms of industrial design or winemaking scheduling.

Type II consists of project networks with an elevated awarded budget and the highest number of participating companies. They have relatively long duration (3.2 years on average), and tend to solve tasks of a routine nature and involve firms which have collaborated with one another in the past. They have mixed legal status (about 50 per cent with a separate legal status).

A very distinct feature of this type is its task: solving tasks of a routine nature and generating a high degree of innovation (Type II: 49.2 per cent vs Type I: 20.1 per cent) through legal autonomous entities or contractual agreements. The data clearly indicate in Type II an exploration strategy characterised by experimentation, novelty and research (Voss *et al.*, 2008). The much larger size is also very striking, indicated by the relatively high number of organisations and persons involved. More frequently than in Type I, these organizations have collaborated with one another in the past and have used a project-based operation method.

The task variable has been analyzed not only with reference to the repetitively of the projects developed but also with the features of the level of innovation. It emerged, in particular, that about 50 per cent of Type II projects were linked to the development of a new product (as against about 30 per cent for Type I) and 80 per cent of projects aimed at developing wines with DOCG and DOC certifications. Moreover, 40 per cent of Type II projects were related to variation on existing process (as against 30 per cent for Type I) and in terms of semantic upgrade (e.g. wine as a social experience or associated with travelling in a specific region). Such an orientation in quality product development was only found in about 30 per cent of cases in Type I.

By assessing task variability in different analytical perspectives (degree of product innovativeness; variation on existing process; new generation of existing product; developing of guaranteed quality products) it is possible to highlight the significant difference in the development of innovation in the two company clusters, being clearly more marked in the Type II TPNs (Table VI). A stronger focus towards product innovation and technological as well as semantic process innovation (Bellini and

Dell'Era, 2009) can be discovered in the different configuration of the two temporary collaboration forms.

A typical Type I represents a short-term inter-organisational project with incremental product innovation as its main task; whereas a typical Type II is a long-lasting, large inter-organisational project aiming for radical innovation. In order to develop a new product or a drastic process change in a cluster, companies have to share the knowledge that each has with their partners.

Theories and empirical research on TPNs represent conceptualizations and models that explain and predict the characteristics of temporary organization and contribute to the development in the field (Söderlund, 2004). We were able to expand the understanding of TPNs and innovation under two respects. First, it should be noted that only a few studies have adopted the TPN framework to investigate the inter-organizational coordination mechanisms among SMEs. Our study could usefully find its place in this literature gap, thus contributing to develop a typological research in order to identify TPN clusters with homogeneous distinctive characteristics. In this perspective, the taxonomy realized can have important implications for the future study of TPNs. Researchers should realize that there are many different kinds of project networks and by default, many different kinds of temporary systems. A striking finding of ours is concerned with the fact that the most frequent type of project networks (Type I) consists of small, one-shot exchange networks of extremely short duration, or what could be considered “extremely temporary” inter-organizational networks. In this cluster the TPNs are typically characterized by incremental innovation tasks, that is tasks linked with the development of industrial design, with winemaking scheduling, or with generating new product meanings. On the contrary, Type II TPNs are characterized by more frequent higher-level innovation objectives, associated with variations on an existing process (e.g. the development of techniques for the cultivation of grapes) and/or with a regeneration of existing products (e.g. improvements in organoleptic performances).

It seems reasonable to hypothesise that Types I give rise to quite different mechanisms of coordination and place different demands on management than Type II project networks (large, expensive project networks of long duration, that solving routine tasks). In the former one might expect coordination to be primarily governed by instantly emerging concepts such as swift trust (Meyerson *et al.*, 1996), whereas in Type II, such coordination might rather be shaped by an enduring social structure (Jones and Lichtenstein, 2008).

This suggests that further research into relation between innovation and different organisational forms of TPN (in terms of time, team, task and context) seems very relevant.

Second, our study has an explorative role of analysis, which can be useful for generating research hypotheses in future works, connecting the features of TPNs with the development of innovation processes. The literature is quite limited from this point of view too (Rutten and Oerlemans, 2009), especially with respect to SMEs as mentioned before. The analysis developed in the paper, the cluster analysis, is an empirical classification method, and as such it is first of all an inductive technique which can contribute to the development of hypotheses which must be tested: that is, if the process of inter-firm knowledge creation has certain organizational characteristics,

the outcomes of this process in terms of innovation should be more favourable, overcoming the drawbacks of temporality.

As this paper is part of an ongoing research, we will further develop the findings of our study. The absence of other types of TPNs in Bakker's taxonomy can be due to the choice of a particular agricultural sub-system. For this reason research could provide more interesting results if extended even to the other sub-systems (*filie*) into which the regional agricultural economy is institutionally divided. Furthermore, it should be pointed out that the paper analyzes only certain dimensions that influence functioning of temporary collaboration processes between companies. For instance, an important role in the transaction government related to the innovation project has been played by external or institutional mechanisms such as industry standards and community rules.

Notes

1. On the one hand there are many studies dealing with cooperation which focus on medium and large organizations and on sets of organizations created around a focal one (Lorenzoni, 1992). On the other hand, several researches and studies focus on management of innovation through the analysis of networking among small and medium organizations (Porter, 2000).
2. Deepening focuses on all activities that integrate the traditional ones, upstream and downstream of agriculture. Broadening concerns all those production activities, or more frequently, services, alongside the actual agricultural activity. Regrounding concerns all those activities external to agriculture, yet integrated and complementary within the rural environment, with the purpose of providing employment opportunities for the productive elements (primarily work, but also mechanical equipment, etc.) and an additional source of income for the farmer and the agricultural family (Van der Ploeg *et al.*, 2002).
3. $n = 28$; lowest AIC = 84; lowest Npar = 15; p -value = 0.124 (> 0.05), all indicating highest model fit.

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Further reading

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