

Network Analysis of local territorial systems in Salento: A strategic marketing study

M. Irene Prete

ireneprete@libero.it Italy Università del Salento

Gianluigi Guido

gianluigi.guido@unisalento.it Italy Università del Salento

Maurizio Giannuzzi

maugian86@yahoo.it Italy University of Salento

Purpose of the paper and literature addressed. The present study analyzes the collaborative-informational relation system of specific *Local Territorial Systems* (LTSs) – meso-structures placed between the macro-level of economy and the micro-level of a single company (Guido, 1999) connected by economic, spatial and social variables – identified in the province of Lecce. Moreover, it pursues the aim to determine their degree of attractiveness and competitiveness and evaluate single actors' behaviour. Previous studies (Albertini and Pilotti, 1996; Bergman and Maier, 2009; Fritsch and Kauffeld-Monz, 2010; Huggins and Johnston, 2010; Krätke and Brandt, 2009; Lee, Feiock and Lee 2012; Semlinger, 2008) have indeed demonstrated how relation system analysis – defined as the set of information or collaborations exchanged among the actors of a certain *network* – permits to quantitatively evaluate single actors' ability to perform strategic actions that allow them to step up the competitive position of the *networks* they are a part of. The relation system analysis of the LTSs located in Salento has two research objectives: i) evaluation of the considered LTSs' network structure, carried out by means of *network analysis* – a “paradigm” directed to the theoretical and descriptive analysis of relation structure (Scott and Carrington, 2011; Wasserman and Faust, 2007); and ii) evaluation of the coordination mode among the strategic actors of the LTSs, carried out by the identification of the *prevailing rationality* – the distribution mode of decisional power among actors. As far as the first objective is concerned – evaluation of LTSs' network structure – the following constructs were examined: i) overall network *density* – measuring the diffusion of relations among actors, that represents a condition of effective functioning of networks as a means of knowledge and information sharing (Soda, 1999); ii) network *centralization* – the extent to which a single actor has high centrality, and the other actors low centrality, and, specifically, the level of a whole network's hierarchical structure; iii) actors' *centrality* – actors' importance or prominence as holders of information or influence; and iv) the *strength and frequency of relationships* – respectively, the extent to which actors consider important the relational links existing among them, and the regularity with which they occur. As regards the second objective – evaluation of the coordination mode among strategic subjects – the *prevailing rationality* characterising every single LTS was identified, on the basis of the three typologies described by Rullani (1989): i) the *subjective rationality*, in which a LTS is dominated by a single actor – resulting from low *density* and high *centralization* levels; ii) the *systemic rationality*, in which a LTS operates according to its own laws of functioning, thus determining its own development process – corresponding to high *density* and low *centralization* levels; and iii) the *evolutionary rationality*, in which a LTS operates according to an evolutionary process, due to the existence of different conflicting interests – relating to medium levels of *density* and *centralization*.

Research method and findings. Four LTSs – *Capital, Coast, Upcountry, and Western* – were identified through the segmentation of the 97 Municipalities situated in the Province of Lecce, on the basis of their *social, economic, and spatial* dimension (Guido, 2000) and their specific (*industrial-productive* or *tourist-recreational*) *vocation* (Golfetto, 1996). A close-ended questionnaire, administered to 217 public and private actors, pointed out: i) the *occurrence* of collaborative-informational relationships among actors operating in each LTS, by means of an affirmative or negative reply; ii) the *importance* each actor attributes to these types of relations, measured by a 5-point Likert scale; iii) the *frequency* of these relationships, measured using a 5-point Likert scale. By means of the UCINET software (Borgatti, Everett and Freeman, 2002), indexes of single actor's *centrality*, network *centralization* (in terms of *degree, closeness, and betweenness*) and *density* were computed for each of the four considered LTSs. The relational structures of the LTSs situated in Salento show various homogeneity factors. The density indexes characterizing the four LTSs, being slightly below 0.6, reveal a respectable diffusion of relational activities, thus demonstrating a good propensity to establish informational-collaborative relationships. The centrality indexes calculated for *Municipalities, Business Associations and Banks* – with values comprised between 0.7 and 0.9 – and, to a lesser extent, the centrality indexes for the *Province of Lecce* and the *Chamber of Commerce* as well – with values comprised between 0.5 and 0.6 – underline that, in the four considered LTSs, they represent the most efficient modes for the diffusion of information and knowledge, as they require the fewest interpositions. The *network* considered as a whole – showing centralization indexes comprised between 0.3 and 0.6 – reveals a moderately hierarchical relational structure, in coherence with a *systemic rationality*: when a continuous dialectic among subjective and systemic forces occurs, the ultimate aim of the development of LTSs is the result of a compromise between them.

Main contribution and conclusions. The present study contributes, both in a theoretical perspective and in a managerial one, to the understanding and knowledge of Local Territorial Systems' relational structure and, accordingly, directs the planning, realization and evaluation of local development policies (Guido, 2000). The LTSs located in the Province of Lecce have the potentiality to reach efficacious operating conditions and reinforce their competitiveness. It would be desirable to foster the presence of centralizing forces with tasks of coordination and guide, and, furthermore, to promote the stability and concreteness of the existing relational ties: the emergence of actual cooperative relationships, and not merely the presence of simple informational exchanges, would make synergic and productive relations possible, in relation to the knowledge and capacity of LTSs to accelerate their own developmental process.

Keywords: *Local Territorial Systems; Network Analysis; Prevailing Rationality; Network Centralization; Network Density.*

M. Irene Prete, Gianluigi Guido, Maurizio Giannuzzi

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INTRODUCTION

In contemporary regional strategy, networks and networking between firms and other organizations are deemed to be a fundamental factor of success and competitive advantage (Gulati 2007; Owen-Smith and Powell 2004; Pittaway et al., 2004; Pyke and Sengenberger 1992). In globalised economies, relationships of cooperation and competition may support local economic development and help actors to implement mutual programs, aimed to overcome the limited resource endowments (Lee, Feiock and Lee, 2012; Semlinger, 2008). Previous studies (Albertini and Pilotti, 1996; Bergman and Maier, 2009; Fritsch and Kauffeld-Monz, 2010; Huggins and Johnston, 2010; Krätke and Brandt, 2009; Lee, Feiock and Lee 2012; Semlinger, 2008) have indeed demonstrated how relation system analysis – defined as the set of information or collaborations exchanged among the actors of a certain *network* – permits to quantitatively evaluate single actors' ability to perform strategic actions that allow them to step up the competitive position of the *networks* they are a part of. In particular, the presence of solid network relations has a positive influence on innovation and knowledge transfer and promote regional development resource (Bergman and Maier 2009; Fritsch and Kauffeld-Monz, 2010; Krätke and Brandt, 2009; Semlinger 2008); furthermore, in the context of local government, establishing informal relationships, even with competing actors, is a crucial aspect of achieving the economic development of a specific area (Lee, Feiock and Lee 2010).

The present study analyzes the collaborative-informational relation system of specific *Local Territorial Systems* (LTSs) – meso-structures placed between the macro-level of economy and the micro-level of a single company (Guido, 1999) connected by economic, spatial and social variables – identified in the province of Lecce. It pursues the aim to determine the relational structure and evaluate the coordination mode of public and private actors operating in the four LTSs, which can have an influence on their degree of attractiveness and competitiveness, determine single actors' behavior, and direct the planning, implementation and evaluation of local development policy (Guido, 2000).

In the current reality, private and public actors need to cooperate in order to compete, achieving a delicate balance between cooperative and competitive dynamics (Lee, Feiock and Lee 2012; Semlinger 2008). It is therefore important to turn the attention to those local contexts – such as LTSs – as a consequence of globalization and integration (Guido, 1999). The idea of network therefore represents an external strategic resource (network economies) and a methodology for LTSs: “in this perspective, it is relevant the role of cooperation relations forming between local systems inside territorial strategies of *networking* organizations (Guido, 2000, p. 48).

The new Italian competitive outline – showing companies' and company systems' changed competitiveness (Semlinger 2008; Albertini and Pilotti, 1996) – together with the growing globalization – promoting a greater market openness and developing the local dimension as a “propeller” of competitiveness – has brought about a transformation of territorial situations organizing and relating to each other according to a network model. This process does not nullify the importance of single territorial contexts, but represents a potential means to improve specific local contexts (Rullani, Micelli and Di Maria, 2000; Semlinger 2008).

In order to evaluate both LTSs' network structure and the coordination mode among the strategic actors of the LTSs, the present study is structured as follows: in the first section, LTSs' characteristics and *network analysis* methodology are examined in detail; in the second section, the collaborative and informational relation system of each of the four considered LTSs is examined – by analyzing the indexes of actors' *centrality* and the indexes of network *centralization* – and the evaluation of the coordination mode among strategic actors is carried out by the identification of the *prevailing rationality* – the distribution mode of decisional power among actors. Finally, theoretical and operational implications and conclusions are described.

LOCAL TERRITORIAL SYSTEMS: DEFINITION AND CHARACTERISTICS

The conviction that development economy is strictly related to place economy (Caroli, 1999; Ciciotti, 1995; Davenport, 2005; Guido, 2000; Iyer, Kitson and Toh, 2005; Vernuccio, 2000) has centred the debate on the territorial articulation of economic development (Asheim et al., 2003; Cooke, Heidenreich and Braczyk, 2004; Garofoli, 1992; Rutten and Boekema 2007). The existence of a spatially proximate networked approach has allowed territories and regions to obtain high level of competitiveness (Huggins and Johnston, 2010; Knoblen and Oerlemans, 2006; Lawson and Lorenz, 1999; Owen-Smith and Powell, 2004). *Territory* – i.e. the context of entrepreneurial action – has therefore become an aspect of strategic importance in promoting the economic development processes of a country: “the economic growth does not depend only on the vitality of entrepreneurial action, but also on the development of contexts suitable for the diffusion of such action” (Guido, 1999, p. 250). This idea has led to a new definition of *territory* and a reconsideration of physical space, representing the context of firm activities. *Territory* has therefore gradually become a competitive context and a variable determining development, that cannot be any longer considered apart from the *economic and social* characteristics of the specific area in which development takes place (Ciciotti, 1995).

The composite nature of territory makes it necessary – for the purposes of a more suitable and effective planning of local development – to define a unit of analysis considering such aspects, the LTS. The LTS is not a mere structure – the elements of the system and of the relations existing between them – but a real organization – characterized by the contribution every single element is able to make to the formation of the system itself – and therefore becomes an open system continuously interacting with its relevant environments (Lomi, 1991). The LTS is marketable as a *multi-sale product*, which means that it can be sold to several groups of users and used for different purposes; “it can be sold to a potential industrial investor as an idea, consisting of such elements as modernity, dynamism and efficiency, and, often simultaneously, of such specific features, as a little expensive building area, very fast transport, and a noteworthy view” (Guido, 2000, p. 7).

The aim of LTSs is not a mere *economic growth* (employment growth, attraction of new investments and tourists and, in general, output increase), that is simply a means to achieve the *strategic aim of development*. The real strategic goal of LTSs is instead a (territorial, economic and social) *development*, characterized by the optimization of the relation between available resources and users' needs in a certain territory.

RESEARCH AIM AND OBJECTIVES

The present study aims to analyze the relation system characterizing the LTSs in the province of Lecce, in order to interpret the formal or informal cooperation modes with which public and private, single *organizational actors* operate inside them. The analysis of the relational structure, permitting a theoretical and interpretative description of the existing relations, provides an organizational intervention criterion for directing the planning of local development policy of the LTSs situated in Salento. The collaborative-informational network of every LTS, consisting in a network of relations connecting companies, public institutions and several social actors playing a specific role inside a system, indeed contributes to determine its attractiveness and competitiveness.

The relation system analysis of the LTSs in the province of Lecce has two research objectives: i) evaluation of LTSs' network structure, carried out through a conclusive-descriptive study, exploiting a conceptual means for a theoretical and descriptive analysis of relation structures, i.e. *network analysis*; e ii) evaluation of the coordination mode among the strategic subjects of the LTSs, carried out through the identification of the *prevailing rationality*, representing the distribution mode of decisional power among actors (Rullani 1989).

As far as the first objective is concerned – evaluation of LTSs' network structure – the following constructs were examined: i) network *density* – that measures the diffusion of relations among actors in a network, thus representing a condition of effective functioning of networks as a means of a greater sharing of information and knowledge (Soda, 1999); ii) network *centralization* – the degree of network organization around its more central actors, and, specifically, the degree of hierarchisation of a network considered as a whole (Freeman, 1979); iii) actors' *centrality* – the potential for attractiveness possessed by every actor – seen as a holder of such resources as information or influence – that is positively related to efficiency in problem solution, to leadership perception, and to the satisfaction those involved in decisional situations get (Freeman, 1979); and iv) *strength* and *frequency of relationships* – respectively, the extent to which actors consider important the relational links existing among them, and the regularity with which they occur. As regards the second objective – evaluation of the coordination mode among strategic subjects – the *prevailing rationality* characterizing every single LTS was identified, on the basis of the three typologies described by Rullani (1989): i) the *subjective rationality*, in which a LTS is dominated by a single actor (a leader company or a political force) holding the power – resulting from a low level of *density* and a high level of *centralization*, and therefore from a low diffusion of relations and a high level of *network* hierarchisation; ii) the *systemic rationality*, in which no actor stands out as a holder of greater relational resources and a LTS operates according to its own laws of functioning, thus determining its own development process – corresponding to a high level of *density* and a low level of *centralization*; and iii) the *evolutionary rationality*, resulting from the interdependent decisions taken by all the actors operating according to an evolutionary process, due to the existence of conflicting interests – relating to medium levels of *density* and *centralization*. The evaluation of the *prevailing rationality* represents a fundamental step in planning potential evolutionary developments of LTSs, since it permits to identify those factors helping a LTS to increase its competitiveness.

METHODOLOGY

This study examines four LTSs – called *Capital*, *Coast*, *Upcountry*, and *Western* – on the basis of a previous research (Guido, 2007). These areas were identified segmenting the 97 Municipalities situated in the Province of Lecce, and considering 968 variables related to the *social*, *economic*, and *spatial* dimension (Guido, 2000) and the specific (*industrial-productive* or *tourist-recreational*) *vocation*. The variables considered in relation to the *social dimension* were as follows: population demographic characteristics, residents’ social conditions, socio-economic relationships forming between the residents of various Municipalities and local initiatives aiming at addressing the activities of local administrations to a single objective of sustainable territory development; as far as the *economic dimension* is concerned, the variables related to residents’ or local firms’ wealth were examined; finally, as regards the *spatial dimension*, the variables considered were those not related only to physical-geographical space, but also to the resources and the elements/objects existing in it (e.g. shops, streets, local units, churches, vehicles moving around, etc.) that affect economy and residents’ social life and, simultaneously, are the direct result of actors’ behavior and actions in a certain territory.

The *network* analyzed was the *informational-collaborative system*, i.e. the set of information or collaborations exchanged among public and private actors inside every single LTS of the province of Lecce. In particular, the study examined the relations involved in *productive cooperation* – including *functional relations* (exchange of products, services, money and job services) and *authority or hierarchical relations* (generating subordination or dependency) – and *information exchange* – consisting in *communication relations* among actors (informational and symbolic exchanges) (cfr. Lomi, 1991). The former relations represent a formal mode of diffusion of information, meanwhile the latter represent an informal cooperation mode (Albertini and Pilotti, 1996).

A close-ended questionnaire was administered, by using a traditional paper-and-pencil self-administration interview method by e-mail or handing paper questionnaire to people in person and inviting them to fill them. The questionnaire, administered to 250 public and private actors, was fully completed by 217 of them, thus obtaining a 87% of survey response rate. Actors were grouped in the following 14 categories – *Municipalities*, *Province*, *Development Agents*, *Chamber of Commerce*, *Large Enterprises*, *Leader Enterprises*, *Small and Medium Enterprises* (SMEs), *Tourism Enterprises*, *Advanced Tertiary Sector*, *Banks*, *Cultural Institutions*, *Trade Unions*, *Business Associations*, *Other Private Associations* (Table 1). The questionnaire pointed out: i) the *existence* of collaborative-informational relationships with the other actors of every LTS, identified through an affirmative or negative answer; ii) the *importance* attributed to these relationships, measured by a 5-point Likert scale; iii) the *frequency* with which these relationships occur, measured using a 5-point Likert scale.

The method used for the analysis of competitive domain of the LTSs is *network analysis*¹ that, on the basis of raw relational data, provides a description and an interpretation of relational structures developing within LTSs, permitting comparisons between different local contexts. By means of the UCINET software (Borgatti, Everett and Freeman, 2002) the following indexes were computed for each of the four LTSs: i) *density*², that indicates “the

¹ *Network analysis* aims to study organizational systems, quantitatively assessing relational qualities. LTSs in the province of Lecce, and, in general, any organizational form, are described as *networks* made up of *actors* (units of analysis) and *relations* (collaborations, information, etc.). It is based on *graph theory*, according to which actors and relations among them are represented, respectively, by points or nodes and segments linking them (Lomi 1991), characterized by specific geometric properties. Using relational matrices – that can identify the existence or the absence of relations, and their importance or frequency – density indexes, (local) indexes of centrality and (global) indexes of centralization are calculated.

² Density index can be computed in terms of *degree* (the number of lines incident with each node), and is equal to:

$$D[G(p,q)] = \frac{\sum d_i}{p(p-1)}$$

Table 1: *Description of the Detailed Sample Used in the Study*

CATEGORIES OF ACTORS	ACTORS	NUMBER	LTS
PROVINCE	Province	1	1,2,3,4
MUNICIPALITIES	Municipalities	11	1,2,3,4
	Municipalities' Unions	2	1,2
CHAMBER OF COMMERCE	CCIAA	1	1,2,3,4
DEVELOPMENT AGENCIES	Group of Local Action	2	3
	Cisi Puglia Spa	1	1,2,3,4
	CTI	1	1,2,3,4
	Temping Agencies	1	4
	Pro Loco	17	1,2,3,4
	APT	1	1,2,3,4
CULTURAL INSTITUTIONS	University	1	1,2,3,4
	Museums	5	1,2,3,4
TOURISM ENTERPRISES	Travel Agencies	5	2,3,4
	Hotels	13	1,2,3,4
	Restaurants	9	1,2,3,4
	Nightspots	4	1,2,3,4
BUSINESS ASSOCIATIONS	Assindustria	1	1,2,3,4
	Confindustria	1	1,2,3,4
	Confartigianato	1	1,2,3,4
	Confcommercio	1	1,2,3,4
	CNA	1	1,2,3,4
	API	1	1,2,3,4
LEADER ENTERPRISES	Food	1	1,2,3,4
	Textile	1	1,2,3,4
	Constructions	1	1,2,3,4
	Mechanical	1	1,2,3,4
	Retailing	1	1,2,3,4
LARGE ENTERPRISES	Food	4	1,2,3,4
	Textile	3	1,2,3
	Constructions	3	1,3,4
	Mechanical	3	1,3,4
	Retailing	3	2,3,4
SMEs	Food	22	1,2,3,4
	Textile	21	1,2,3,4
	Constructions	14	1,2,3,4
	Mechanical	16	1,2,3,4
	Retailing	18	1,2,3,4
PRIVATE ASSOCIATIONS	Pensioners Associations	1	1,2,3,4
	Housewives Associations	1	1,2,3,4
	Student Associations	1	1,2,3,4
	Consumers Associations	1	1,2,3,4
	Religious Associations	2	1,2,3,4
	Political Associations	2	1,2,3,4
	Non Profit Organizations	6	1,2,3,4
TRADE UNIONS	Trade Unions	1	1,2,3,4
BANKS	Banks	4	1,2,3,4
ADVANCED TERTIARY SECTOR	Consulting agencies	5	1,2,3,4

Note: Number = Number of actors interviewed. LTS: 1=Capital LTS; 2=Coast LTS; 3=Upcountry LTS; 4=Western LTS.

extent to which relations are diffused among all the actors, no one excluded” (Soda, 1999, p. 394) and measures the general level of a system’s completeness, thus representing a condition of effective functioning of groups (Lomi, 1991); ii) indexes of single actors’ *centrality*, and, in particular, Nieminem’s index (N_g), that represents the intensity characterizing actors’ exchange activities in relation to the composition of the considered network in numerical terms, i.e. its integration into a system³; Sabidussi’s index (S_c), measuring the immediacy with which an actor contacts the others through the most efficient mode for the diffusion of information (the actor with the highest index)⁴; and Freeman’s index (F_b), measuring the strategic value, i.e. an actor’s power of control over the communication between two other actors⁵; and iii) indexes of network *centralization*, measuring the level of hierarchisation of a network considered as a whole, i.e. the extent to which a graph organizes itself around its more central actor (Scott, 1997), in terms of degree, closeness and betweenness (Nieminem’s, Sabidussi’s and Freeman’s indexes of centralization) (Lomi, 1991; Soda, 1999; Wasserman and Faust, 1995).

DATA ANALYSIS AND RESULTS

Network density and centralization indexes of the four considered LTSs

Considering the first research objective, density of the four considered LTSs was computed. *Capital LTS*, including only the Municipality of Lecce and characterized by a strong *industrial-productive vocation* (Guido, 2007), has a density (*Density Overall Index*) equal to .631 (*Adiacency Symmetrized Matrix*); density of *Coast LTS*, including 10 Municipalities located on the seashore of the Salento and possessing a strong *tourist-recreational vocation* (Guido, 2007), turns out to be equal to .620; *Upcountry LTS*, including 56 Municipalities in the Province of Lecce and lacking of a specific *territorial vocation* (Guido, 2007), has a *density* equal to .569; finally, density of *Western LTS*, composed by 30 Municipalities of the Province of Lecce and characterised by an *industrial-productive vocation* (Guido, 2007), has a value equal to .609 (Table 2). The relational network of the four considered LTSs shows a significant number of informative and cooperative exchanges among its different actors.

Centralization Indexes characterising entire network of the four LTSs were calculated. *Nieminem Centralization Indexes* (degree) (*outdegree* and *indegree*) for the *Adiacency*, *Frequency* and the *Importance Matrix*, *Sabidussi Centralization Indexes* (*closeness*) (*outdegree* and *indegree*) for the *Adiacency*, *Frequency* and the *Importance Matrix*, and, finally, *Freeman Indexes* (*betweenness*) for the *Adiacency*, *Frequency* and the *Importance Matrix* underscored a moderate degree of hierarchisation around the principle actors of each LTS (Table 2). Therefore, the high value of *Density Overall Index* and the moderate degree

³ Nieminem’s index, based on degree, is equal to

$$C_i(P_i) = \frac{\sum a_{ij}}{(p-1)}$$

(a_{ij} = element of the relation matrix; p = number of the actors of a network)

⁴ Sabidussi’s index, based on *closeness*, i.e. the number of segments forming the shortest distance between two nodes, is equal to

$$s_i = \left(\frac{\sum d_{ij}}{(p-1)} \right)^{-1}$$

(d_{ij} = element of the closeness matrix)

⁵ Freeman’s index, based on *betweenness*, i.e. the intermediate position of a point, is equal to

$$F_b(P_k) = \frac{2 \sum_i \sum_j b_{ij}}{(p^2 - 3p + 2)}$$

(b_{ij} =element resulting from the elaboration of the closeness matrix)

and represents the number of ways that links node I to point J and in which node K is situated.

of network's centralization indexes demonstrated that the considered LTSs present a *systemic rationality*.

Table 2: *Network Density, Centralization Indexes and Prevailing Rationality of the Four Considered LTSs*

LTS		CAPITAL	COAST	UPCOUNTRY	WESTERN
<i>Density Overall Index</i>		.631	.620	.569	.609
<i>Number of Ties</i>		115	113	109	111
<i>Nieminem Centralization Indexes (Degree)</i>					
Adiacency Matrix	Outdegree	.313	.325	.349	.420
	Indegree	.396	.325	.431	.337
Frequency matrix	Outdegree	.318	.359	.337	.334
	Indegree	.318	.243	.271	.235
Importance matrix	Outdegree	.320	.365	.336	.340
	Indegree	.320	.266	.286	.224
<i>Sabidussi Centralizations Indexes (Closeness)</i>					
Adiacency Matrix	Outdegree	.400	.418	.488	.668
	Indegree	.550	.421	.610	.551
Frequency matrix	Outdegree	.400	.418	.488	.627
	Indegree	.550	.421	.610	.518
Importance matrix	Outdegree	.400	.428	.488	.677
	Indegree	.500	.421	.610	.524
<i>Freeman Centralization Indexes (Betweenness)</i>					
Adiacency Matrix		.100	.080	.108	.138
Frequency matrix		.100	.080	.108	.138
Importance matrix		.100	.080	.108	.138
<i>Prevailing Rationality</i>		Systemic	Systemic	Systemic	Systemic

Actors' Centrality Indexes of the Capital LTS

Considering actors' centrality indexes of each LTS, in the Capital LTS the single *Nieminem Centrality Indexes* showed an imbalance between the relationships sent by the actors (*outdegree*) and the relationships received (*indegree*) as they resulted from the *Adiacency*, *Frequency* and *Importance* matrices: therefore, in *Capital LTS*, the strategic subject operates in conditions of asymmetry.

Table 3: *Nieminem Local Indexes of the Capital LTS*

ACTORS	ADIACENCY	FREQUENCY	IMPORTANCE
Province	N _o =.846 N _i =.923	N _o =.492 N _i =.600	N _o =.538 N _i =.630
Municipality of Lecce	N _o =.769 N _i =1.00	N _o =.523 N _i =.646	N _o =.523 N _i =.661
Development Agencies	N _o =.846 N _i =.461	N _o =.384 N _i =.292	N _o =.415 N _i =.292
Chamber of Commerce	N _o =.615 N _i =.846	N _o =.369 N _i =.461	N _o =.369 N _i =.492
Cultural Institutions	N _o =.923 N _i =.384	N _o =.446 N _i =.200	N _o =.446 N _i =.215
Leader Enterprises	N _o =.615 N _i =.461	N _o =.292 N _i =.246	N _o =.307 N _i =.276
Large Enterprises	N _o =.615 N _i =.461	N _o =.292 N _i =.246	N _o =.307 N _i =.276
SMEs	N _o =.461 N _i =.384	N _o =.246 N _i =.184	N _o =.246 N _i =.184
Advanced Tertiary Sector	N _o =.615 N _i =.923	N _o =.384 N _i =.507	N _o =.384 N _i =.523
Banks	N _o =.769 N _i =.769	N _o =.369 N _i =.523	N _o =.384 N _i =.523
Tourism Enterprises	N _o =.384 N _i =.692	N _o =.184 N _i =.246	N _o =.215 N _i =.261
Business Associations	N _o =.923 N _i =.615	N _o =.646 N _i =.292	N _o =.661 N _i =.292
Trade Unions	N _o =.230 N _i =.769	N _o =.153 N _i =.369	N _o =.153 N _i =.369
Other Private Associations	N _o =.230 N _i =.153	N _o =.123 N _i =.092	N _o =.138 N _i =.092

Note: N_o= Nieminem External Index (*Outdegree*); N_i= Nieminem Internal Index (*Indegree*)

Table 4: *Sabidussi and Freeman Local Indexes of the Capital LTS*

ACTORS	ADIACENCY	FREQUENCY	IMPORTANCE
Province	S _c =.928 F _b =.104	S _{co} =.866 S _{ci} =.928 F _b =.104	S _{co} =.866 S _{ci} =.928 F _b =.104
Municipalities	S _c =1.00 F _b =.124	S _{co} =.812 S _{ci} =1.00 F _b =.124	S _{co} =.812 S _{ci} =1.00 F _b =.124
Development Agencies	S _c =.928 F _b =.009	S _{co} =.866 S _{ci} =.650 F _b =.009	S _{co} =.866 S _{ci} =.650 F _b =.009
Chamber of Commerce	S _c =.928 F _b =.023	S _{co} =.866 S _{ci} =.722 F _b =.023	S _{co} =.722 S _{ci} =.866 F _b =.023
Cultural Institutions	S _c =.928 F _b =.042	S _{co} =.928 S _{ci} =.619 F _b =.042	S _{co} =.928 S _{ci} =.619 F _b =.042
Leader Enterprises	S _c =.812 F _b =.003	S _{co} =.722 S _{ci} =.650 F _b =.003	S _{co} =.722 S _{ci} =.650 F _b =.003
Large Enterprises	S _c =.812 F _b =.003	S _{co} =.722 S _{ci} =.650 F _b =.003	S _{co} =.722 S _{ci} =.650 F _b =.003
SMEs	S _c =.764 F _b =.001	S _{co} =.650 S _{ci} =.619 F _b =.001	S _{co} =.650 S _{ci} =.619 F _b =.001
Advanced tertiary sector	S _c =.928 F _b =.042	S _{co} =.722 S _{ci} =.928 F _b =.042	S _{co} =.722 S _{ci} =.928 F _b =.042
Banks	S _c =.866 F _b =.044	S _{co} =.812 S _{ci} =.812 F _b =.044	S _{co} =.812 S _{ci} =.812 F _b =.044
Tourism Enterprises	S _c =.764 F _b =.001	S _{co} =.619 S _{ci} =.764 F _b =.001	S _{co} =.619 S _{ci} =.764 F _b =.001
Business Associations	S _c =.928 F _b =.027	S _{co} =.928 S _{ci} =.722 F _b =.027	S _{co} =.928 S _{ci} =.722 F _b =.027
Trade Unions	S _c =.866 F _b =.000	S _{co} =.565 S _{ci} =.812 F _b =.000	S _{co} =.565 S _{ci} =.812 F _b =.000
Other Associations	Private S _c =.565 F _b =.000	S _{co} =.565 S _{ci} =.541 F _b =.000	S _{co} =.565 S _{ci} =.541 F _b =.000

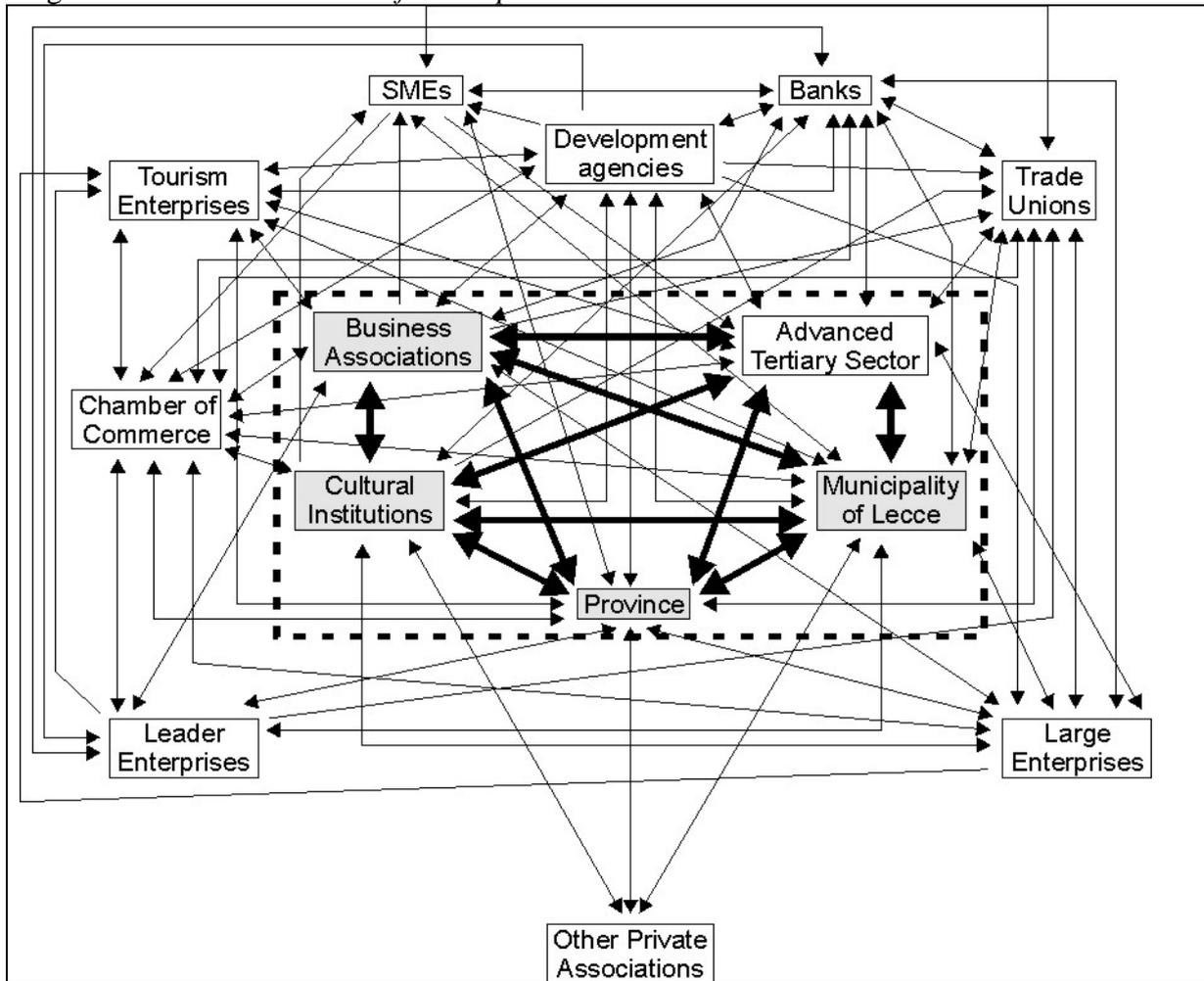
Note: S_c= Sabidussi Local Index (*Closeness*); S_{co}= Sabidussi Local Index (*OutCloseness*); S_{ci}= Sabidussi Local Index (*InCloseness*); F_b= Freeman Local Index (*Betweenness*).

Concerning the number of relationships (*Adiacency Matrix*), the actors sending an higher quantity of connections were *Business Associations* (.923) and *Cultural Institutions* (.923), while the most receptive actors were the *Municipality of Lecce* (1.00), the *Province* (.923) and the *Advanced Tertiary Sector* (.923) (Table 3). The most frequent (*Frequency Matrix*) and important (*Importance Matrix*) relationships were transmitted by *Business associations* (.646; .661) and received by the *Municipality* (.646; .661). Analyzing *Sabidussi Centrality Indexes (closeness)*, calculated considering *Adiacency, Frequency and Importance Matrices*, in *Capital LTS* the *Municipality of Lecce* (1.00; .812; 1.00; .812; 1.00) and *Business Associations* (.928; .928; .722; .928; .722) were the main actors in terms of *closeness* (Table 4). According to *Freeman Centrality Indexes (betweenness)*, the *Municipality of Lecce* (.124; .124; .124) and the *Province* (.104; .104; .104) interposed themselves in the informative and cooperative exchanges more than the other actors (Table 4). The network structure of the collaborative and informative relationships of Capital LTS is represented in Figure 1.

Actors' Centrality Indexes of the Coast LTS

In the Coast LTS, *Niemenin Indexes* attested a situation of asymmetry between the relations sent (*outdegree*) and received (*indegree*) by the actors. In particular, *Cultural Institutions* (.923) and *Business Associations* (.923) were the actors sending a higher number of relations (*Adiacency Matrix*), while *Municipalities* (.923) and the *Advanced Tertiary Sector* (.923) were the most receptive actors (Table 3). In the *Coast LTS*, the most frequent relations (*Frequency Matrix*) were sent by *Business Associations* (.646) and the *Province* (.492), and were received by *Municipalities* (.538); concurrently, the most important ties (*Importance Matrix*) were transmitted by *Business Associations* (.661) and received by *Municipalities* (.569) (Table 4). *Sabidussi Centrality Indexes (closeness)*, calculated for the *Adiacency, Frequency and Importance Matrices*, showed that *Municipalities* (.928; .764; .928; .764; .928) and the *Province* (.928; .866; .812; .866; .812) were the most central actors in terms of *closeness* (Table 5). According to the *Freeman Centrality Indexes (betweenness)*, *Municipalities* (.106; .106; .106) and the *Province* (.092; .092; .092) were most able to mediate relations between the different actors composing the LTS (Table 5). Collaborative and informative relationships of *Coast LTS* are represented in Figure 2.

Figure 1: Network Structure of the Capital LTS



Note:

- Network area with high density indexes
- ▒ Actors with high centrality indexes
- One way informative collaborative relationships with low centrality indexes
- ↔ Bidirectional informative collaborative relationships with low centrality indexes
- ➔ One way informative collaborative relationships with high centrality indexes
- ↔➔ Bidirectional informative collaborative relationships with high centrality indexes

Actors' Centrality Indexes of the Upcountry LTS

In the Upcountry LTS, the *Niemenen Local Indexes of Upcountry LTS* demonstrated a situation of asymmetry of the informative and cooperative relationships between the actors. In particular, the most proactive actors (*Adjacency Matrix*) were *Business Associations* (.923) and *Cultural Institutions* (.923), while the most receptive ones were *Municipalities* (1.00), the *Province* (.923) and the *Advanced Tertiary Sector* (.923) (Table 6). The most frequent relations (*Frequency Matrix*) were transmitted by *Business Associations* (.646) and the *Province* (.646) and obtained by *Banks* (.523), *Municipalities* (.523) and *Chamber of Commerce* (.523), while the most important ones (*Importance Matrix*) were sent by *Business*

Table 4: *Niemenen Local Indexes of the Coast LTS*

ACTORS	ADIACENCY	FREQUENCY	IMPORTANCE
Province	N _o =.846 N _i =.769	N _o =.492 N _i =.476	N _o =.492 N _i =.553
Municipalities	N _o =.692 N _i =.923	N _o =.415 N _i =.538	N _o =.430 N _i =.569
Development Agencies	N _o =.846 N _i =.461	N _o =.384 N _i =.261	N _o =.384 N _i =.261
Chamber of Commerce	N _o =.615 N _i =.846	N _o =.369 N _i =.446	N _o =.369 N _i =.476
Cultural Institutions	N _o =.923 N _i =.461	N _o =.446 N _i =.215	N _o =.461 N _i =.215
Leader Enterprises	N _o =.538 N _i =.615	N _o =.184 N _i =.246	N _o =.230 N _i =.246
Large Enterprises	N _o =.538 N _i =.615	N _o =.184 N _i =.246	N _o =.200 N _i =.246
SMEs	N _o =.384 N _i =.384	N _o =.138 N _i =.184	N _o =.138 N _i =.184
Advanced Tertiary Sector	N _o =.615 N _i =.923	N _o =.230 N _i =.461	N _o =.230 N _i =.461
Banks	N _o =.769 N _i =.769	N _o =.369 N _i =.430	N _o =.369 N _i =.430
Tourism Enterprises	N _o =.538 N _i =.615	N _o =.230 N _i =.200	N _o =.246 N _i =.200
Business Associations	N _o =.923 N _i =.461	N _o =.646 N _i =.230	N _o =.661 N _i =.230
Trade Unions	N _o =.230 N _i =.692	N _o =.153 N _i =.369	N _o =.153 N _i =.369
Other Private Associations	N _o =.230 N _i =.153	N _o =.123 N _i =.061	N _o =.138 N _i =.061

Note: N_o= Nieminen External Index (*Outdegree*); N_i= Nieminen Internal Index (*Indegree*)

Table 5: *Sabidussi and Freeman Local Indexes of the Coast LTS*

ACTORS	ADIACENCY	FREQUENCY	IMPORTANCE
Province	S _c =.928 F _b =.092	S _{co} =.866 S _{ci} =.812 F _b =.092	S _{co} =.866 S _{ci} =.812 F _b =.092
Municipalities	S _c =.928 F _b =.106	S _{co} =.764 S _{ci} =.928 F _b =.106	S _{co} =.764 S _{ci} =.928 F _b =.106
Development Agencies	S _c =.928 F _b =.011	S _{co} =.866 S _{ci} =.650 F _b =.011	S _{co} =.866 S _{ci} =.650 F _b =.011
Chamber of Commerce	S _c =.928 F _b =.034	S _{co} =.722 S _{ci} =.866 F _b =.034	S _{co} =.722 S _{ci} =.866 F _b =.034
Cultural Institutions	S _c =.928 F _b =.053	S _{co} =.928 S _{ci} =.650 F _b =.052	S _{co} =.928 S _{ci} =.650 F _b =.052
Leader Enterprises	S _c =.866 F _b =.012	S _{co} =.684 S _{ci} =.722 F _b =.012	S _{co} =.684 S _{ci} =.722 F _b =.012
Large Enterprises	S _c =.866 F _b =.012	S _{co} =.684 S _{ci} =.722 F _b =.012	S _{co} =.684 S _{ci} =.722 F _b =.012
SMEs	S _c =.764 F _b =.000	S _{co} =.590 S _{ci} =.619 F _b =.000	S _{co} =.590 S _{ci} =.619 F _b =.000
Advanced tertiary sector	S _c =.928 F _b =.053	S _{co} =.722 S _{ci} =.928 F _b =.053	S _{co} =.722 S _{ci} =.928 F _b =.053
Banks	S _c =.866 F _b =.049	S _{co} =.812 S _{ci} =.812 F _b =.049	S _{co} =.812 S _{ci} =.812 F _b =.049
Tourism Enterprises	S _c =.764 F _b =.007	S _{co} =.684 S _{ci} =.722 F _b =.007	S _{co} =.684 S _{ci} =.722 F _b =.007
Business Associations	S _c =.928 F _b =.014	S _{co} =.928 S _{ci} =.650 F _b =.014	S _{co} =.928 S _{ci} =.650 F _b =.014
Trade Unions	S _c =.565 F _b =.000	S _{co} =.565 S _{ci} =.764 F _b =.000	S _{co} =.565 S _{ci} =.764 F _b =.000
Other Associations	S _c =.565 F _b =.000	S _{co} =.565 S _{ci} =.520 F _b =.000	S _{co} =.565 S _{ci} =.520 F _b =.000

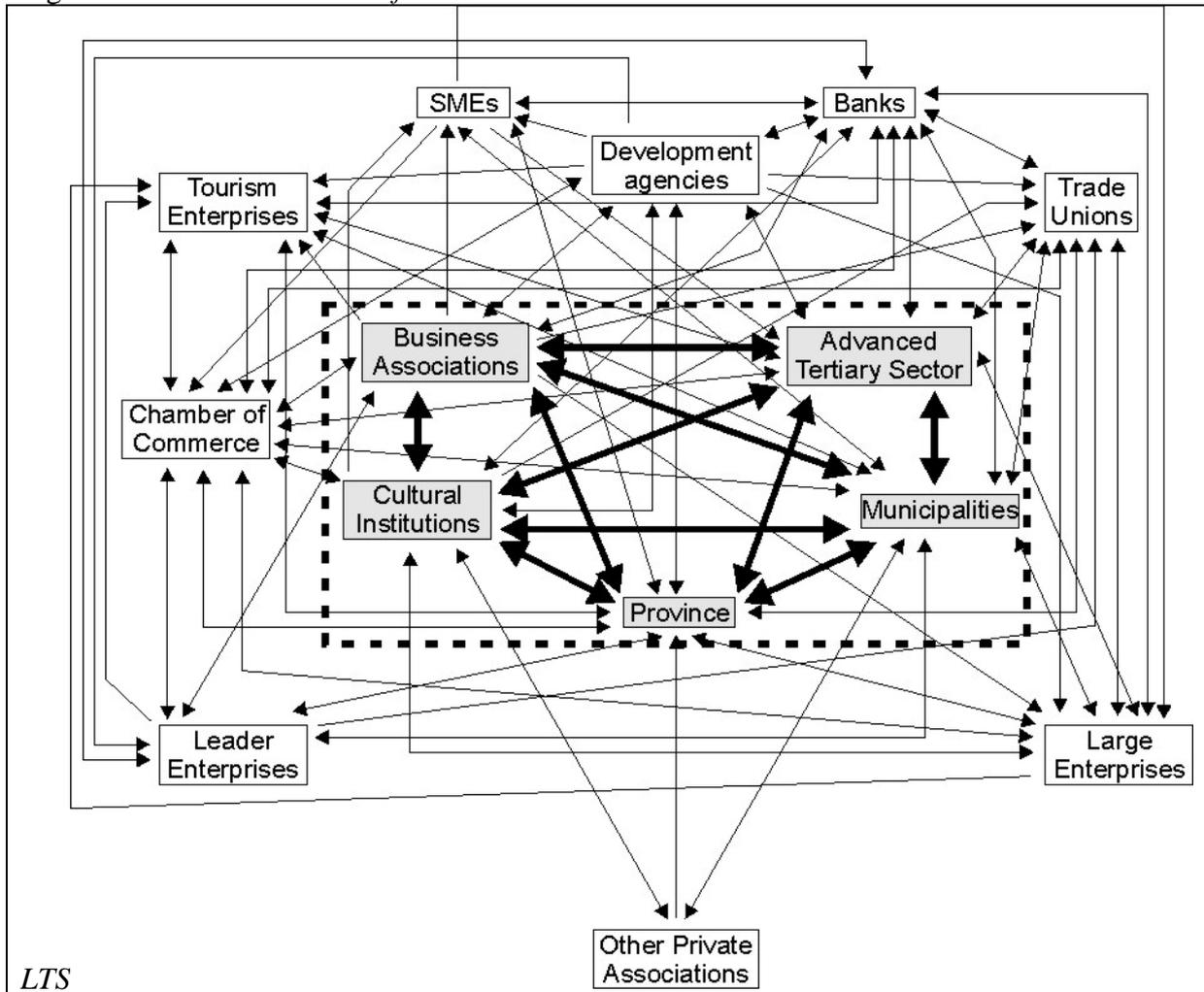
Note: S_c= Sabidussi Local Index (*Closeness*); S_{co}= Sabidussi Local Index (*OutCloseness*); S_{ci}= Sabidussi Local Index (*InCloseness*); F_b= Freeman Local Index (*Betweenness*).

Associations (.661) and received by *Municipalities* (.615) (Table 7). In the *Upcountry LTS*, *Sabidussi Centrality Indexes* (*closeness*), calculated for the *Adiacency*, *Frequency* and *Importance Matrices*, demonstrated that *Municipalities* (1.00; .650; 1.00; .650; 1.00), the *Province* (.928; .866; .866; .866; .866) and *Business Associations* (.928; .928; .722 ; .928; .722) turned out to be closest to the others actors (Table 7, *supra*). On the other hand, the *Province* (.138; .138; .138) and *Cultural Institutions* (.106; .106; .106) were the most central actors – in terms of interposition of relations between the different actors – according to *Freeman Centrality Indexes* (*betweenness*) (Table 6, *supra*). Collaborative and informative relationships of *Upcountry LTS* are represented in Figure 3.

Actors' Centrality Indexes of the Western LTS

In the *Western LTS*, *Nieminen Local Indexes* showed a situation of imbalance of the relational structure and also demonstrated that *Municipalities* (1.00), *Business Associations* (.923) and *Cultural Institutions* (.923) were the most proactive actors (*Adiacency Matrix*), while *Municipalities* (.923) and the *Advanced tertiary sector* (.923) were the most receptive

Figure 2: Network Structure of the Coast LTS



LTS

Note:

- Network area with high density indexes
- ▭ Actors with high centrality indexes
- One way informative collaborative relationships with low centrality indexes
- ↔ Bidirectional informative collaborative relationships with low centrality indexes
- ➔ One way informative collaborative relationships with high centrality indexes
- ↔ Bidirectional informative collaborative relationships with high centrality indexes

ones (Table 8). *Business Associations* had the most frequent and important outgoing relationships (.646; .661), while *Municipalities* had the most frequent and important incoming ones (.553; .553) (Table 7). The values of *Sabidussi Centrality Indexes (closeness)*, calculated for the *Adiacency, Frequency and Importance Matrices*, showed that *Municipalities* (1.00; 1.00; .500; 1.00; .500), *Province* (.928; .866; .481; .866; .481) and *Business Associations* (.928; .928; .433; .928; .433) were the main actors in terms of closeness (Table 9). According to *Freeman Centrality Indexes (betweenness)*, *Municipalities* (.154; .154; .154) and *Province* (.087; .087; .087) interposed themselves in the relations more than the other actors (Table 9). The network structure of the collaborative and informative relationships of Capital LTS is represented in Figure 4.

Table 6: *Nieminen Local Indexes of the Upcountry LTS*

ACTORS	ADIACENCY	FREQUENCY	IMPORTANCE
Province	N _o =.846 N _i =.923	N _o =.646 N _i =.261	N _o =.538 N _i =.584
Municipalities	N _o =.538 N _i =1.00	N _o =.492 N _i =.523	N _o =.261 N _i =.615
Development Agencies	N _o =.846 N _i =.384	N _o =.384 N _i =.200	N _o =.415 N _i =.215
Chamber of Commerce	N _o =.615 N _i =.846	N _o =.369 N _i =.523	N _o =.369 N _i =.538
Cultural Institutions	N _o =.923 N _i =.307	N _o =.446 N _i =.153	N _o =.446 N _i =.169
Leader Enterprises	N _o =.615 N _i =.461	N _o =.369 N _i =.261	N _o =.384 N _i =.292
Large Enterprises	N _o =.615 N _i =.461	N _o =.338 N _i =.261	N _o =.353 N _i =.292
SMEs	N _o =.384 N _i =.461	N _o =.200 N _i =.246	N _o =.215 N _i =.246
Advanced tertiary sector	N _o =.461 N _i =.923	N _o =.338 N _i =.492	N _o =.338 N _i =.507
Banks	N _o =.769 N _i =.769	N _o =.369 N _i =.523	N _o =.384 N _i =.523
Tourism Enterprises	N _o =.384 N _i =.538	N _o =.200 N _i =.200	N _o =.230 N _i =.215
Business Associations	N _o =.923 N _i =.615	N _o =.646 N _i =.261	N _o =.661 N _i =.261
Trade Unions	N _o =.230 N _i =.692	N _o =.153 N _i =.384	N _o =.153 N _i =.384
Other Private Associations	N _o =.230 N _i =.076	N _o =.123 N _i =.046	N _o =.138 N _i =.046

Note: N_o= Nieminen External Index (*Outdegree*); N_i= Nieminen Internal Index (*Indegree*)

Table 7: *Sabidussi and Freeman Local Indexes of the Upcountry LTS*

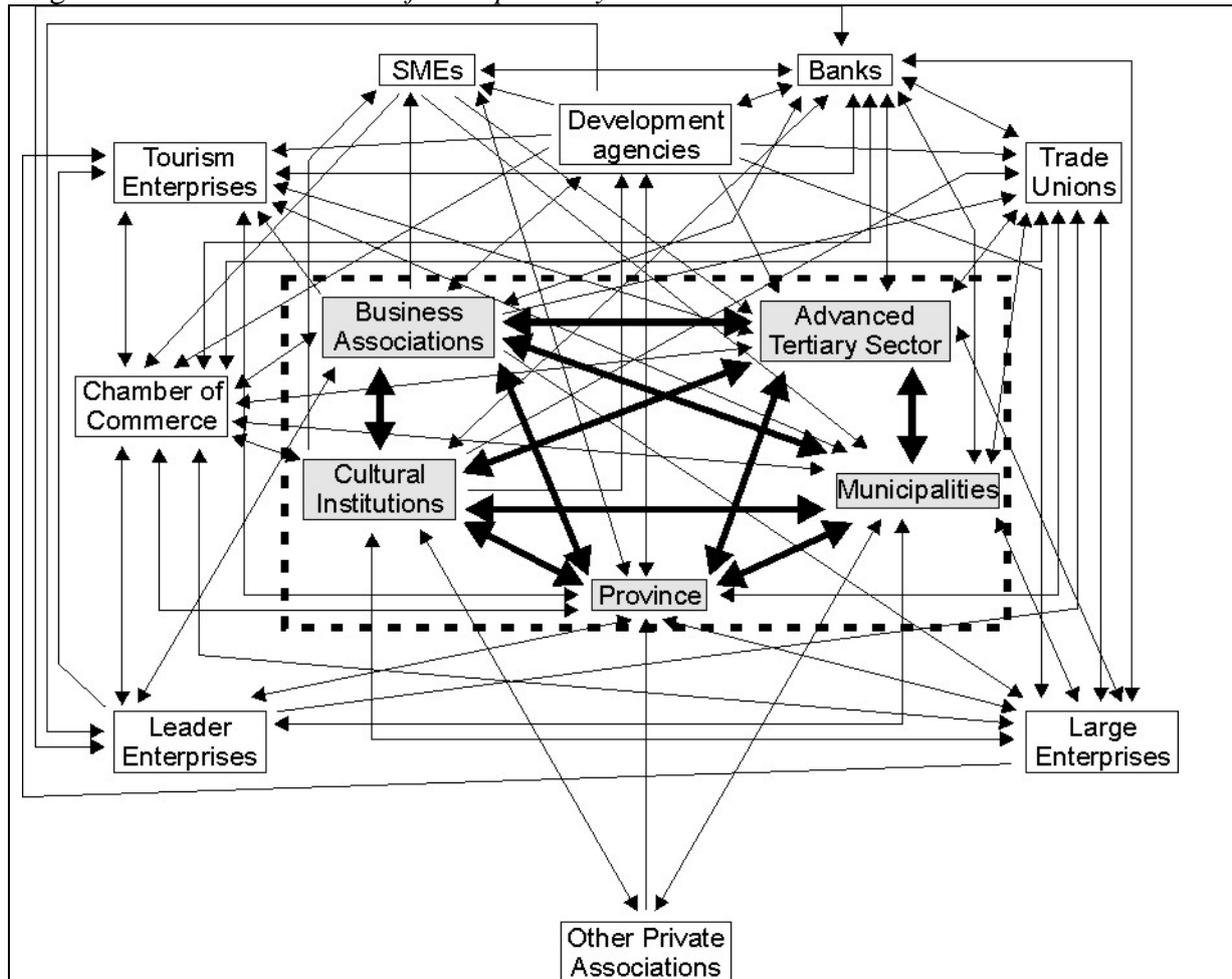
ACTORS	ADIACENCY	FREQUENCY	IMPORTANCE
Province	S _c =.928 F _b =.138	S _{co} =.866 S _{ci} =.866 F _b =.138	S _{co} =.866 S _{ci} =.866 F _b =.138
Municipalities	S _c =1.00 F _b =.049	S _{co} =.650 S _{ci} =1.00 F _b =.049	S _{co} =.650 S _{ci} =1.00 F _b =.049
Development Agencies	S _c =.928 F _b =.007	S _{co} =.812 S _{ci} =.619 F _b =.007	S _{co} =.812 S _{ci} =.619 F _b =.007
Chamber of Commerce	S _c =.928 F _b =.066	S _{co} =.722 S _{ci} =.866 F _b =.066	S _{co} =.722 S _{ci} =.866 F _b =.066
Cultural Institutions	S _c =.928 F _b =.106	S _{co} =.928 S _{ci} =.590 F _b =.106	S _{co} =.928 S _{ci} =.590 F _b =.106
Leader Enterprises	S _c =.812 F _b =.007	S _{co} =.684 S _{ci} =.650 F _b =.007	S _{co} =.684 S _{ci} =.650 F _b =.007
Large Enterprises	S _c =.812 F _b =.007	S _{co} =.684 S _{ci} =.650 F _b =.007	S _{co} =.684 S _{ci} =.650 F _b =.007
SMEs	S _c =.722 F _b =.002	S _{co} =.590 S _{ci} =.650 F _b =.002	S _{co} =.590 S _{ci} =.650 F _b =.002
Advanced tertiary sector	S _c =.928 F _b =.040	S _{co} =.619 S _{ci} =.928 F _b =.040	S _{co} =.619 S _{ci} =.928 F _b =.040
Banks	S _c =.866 F _b =.051	S _{co} =.764 S _{ci} =.812 F _b =.051	S _{co} =.764 S _{ci} =.812 F _b =.051
Tourism Enterprises	S _c =.764 F _b =.001	S _{co} =.590 S _{ci} =.684 F _b =.001	S _{co} =.590 S _{ci} =.684 F _b =.001
Business Associations	S _c =.928 F _b =.045	S _{co} =.928 S _{ci} =.722 F _b =.045	S _{co} =.928 S _{ci} =.722 F _b =.045
Trade Unions	S _c =.565 F _b =.000	S _{co} =.541 S _{ci} =.764 F _b =.000	S _{co} =.541 S _{ci} =.764 F _b =.000
Other Private Associations	S _c =.565 F _b =.000	S _{co} =.565 S _{ci} =.382 F _b =.000	S _{co} =.565 S _{ci} =.382 F _b =.000

Note: S_c= Sabidussi Local Index (*Closeness*); S_{co}= Sabidussi Local Index (*OutCloseness*); S_{ci}= Sabidussi Local Index (*InCloseness*); F_b= Freeman Local Index (*Betweenness*).

DISCUSSION AND IMPLICATIONS

With respect to the characteristics of the network as a whole, the results obtained for the four considered LTSs – *Capital*, *Coast*, *Upcountry*, and *Western* – showed similar levels of *cohesion*: the overall *density* of the informative-collaborative relationships of the network amounts to about .6 (see Table 2), which represents the maximum level of *connectedness* characterising real networks (Mayhew and Levinger, 1976). Furthermore, the moderate degree of the *Centralization Indexes* (*degree*, *closeness* and *betweenness*) characterising each considered LTSs showed a modest degree of hierarchisation around the principal actors of the network (Table 2). Therefore, the high value of *density* and the moderate degree of network's centralization indexes demonstrated that the four considered LTSs present a *systemic rationality*, so they operate in compliance with their own law of functioning, thus determining their own development process (Rullani 1989).

Figure 3: Network Structure of the Upcountry LTS



Note:

- Network area with high density indexes
- ▭ Actors with high centrality indexes
- One way informative collaborative relationships with low centrality indexes
- ↔ Bidirectional informative collaborative relationships with low centrality indexes
- ➔ One way informative collaborative relationships with high centrality indexes
- ↔➔ Bidirectional informative collaborative relationships with high centrality indexes

The indexes of local *centrality* revealed that, in all the four LTS, *Municipalities*, *Province of Lecce*, *Business Associations*, *Cultural Institutions* and also *Advanced Tertiary Sector* have a leading role with the most amount of interactions with all the other actors of the *network*. Their centrality index, in terms of degree (*Nieminen*), showed that they turn out to be catalysts of information and advocates of knowledge of the less connected actors, such as *Tourist Companies*, the actors that mainly contribute to the fruition of the territorial resources and express the *tourist-recreational vocation* of each LTS, the *Small and Medium sized Enterprises*, which play a driving and vital role to the growth of the district economy, and *Other Private Associations*, which engage in public-private dialogue with local administration and government. The results related to the frequency and the importance of ties showed that the amount and the strength of relationships shows a low level in all the four LTS, above all for the *Tourism Enterprises*, *Trade Unions*, and also *Other Private*

Associations. On the other hand, collaborative relationships established among the local public actors (above all, the *Province* and *Municipalities*) and *Cultural Institutions*, *Business Associations* and the *Advanced Tertiary Sector* turned out to be relevant, periodic and valued by the parties. This is associated with the finding, evaluated with the *index of closeness* – related to the measure of the *centrality* as direct function of the closeness with the other organizational actors – that *Municipalities*, *Province of Lecce* and *Advanced Tertiary Sector*, and to a lesser extent also the *Chamber of Commerce* and *Banks*, are the most efficient nodes for the circulation of information and knowledge, as they are able to distribute them more among actors in a more rapid way.

Table 8: *Nieminen Local Indexes of the Western LTS*

ACTORS	ADIACENCY	FREQUENCY	IMPORTANCE
Province	N _o =.846 N _i =.846	N _o =.492 N _i =.507	N _o =.538 N _i =.538
Municipalities	N _o =1.00 N _i =923	N _o =.523 N _i =.553	N _o =.523 N _i =.553
Development Agencies	N _o =.846 N _i =.384	N _o =.384 N _i =.230	N _o =.415 N _i =.230
Chamber of Commerce	N _o =.615 N _i =.769	N _o =.369 N _i =.430	N _o =.369 N _i =.430
Cultural Institutions	N _o =.923 N _i =.384	N _o =.446 N _i =.184	N _o =.446 N _i =.200
Leader Enterprises	N _o =.615 N _i =.538	N _o =.353 N _i =.230	N _o =.353 N _i =.292
Large Enterprises	N _o =.615 N _i =.538	N _o =.353 N _i =.230	N _o =.353 N _i =.292
SMEs	N _o =.384 N _i =.461	N _o =.230 N _i =.215	N _o =.230 N _i =.215
Advanced tertiary sector	N _o =.000 N _i =.923	N _o =.000 N _i =.538	N _o =.000 N _i =.553
Banks	N _o =.769 N _i =.692	N _o =.369 N _i =.492	N _o =.384 N _i =.492
Tourism Enterprises	N _o =.538 N _i =.615	N _o =.246 N _i =.246	N _o =.261 N _i =.261
Business Associations	N _o =.923 N _i =.615	N _o =.646 N _i =.292	N _o =.661 N _i =.292
Trade Unions	N _o =.230 N _i =.692	N _o =.153 N _i =.400	N _o =.153 N _i =.400
Other Private Associations	N _o =.230 N _i =.153	N _o =.123 N _i =.076	N _o =.138 N _i =.076

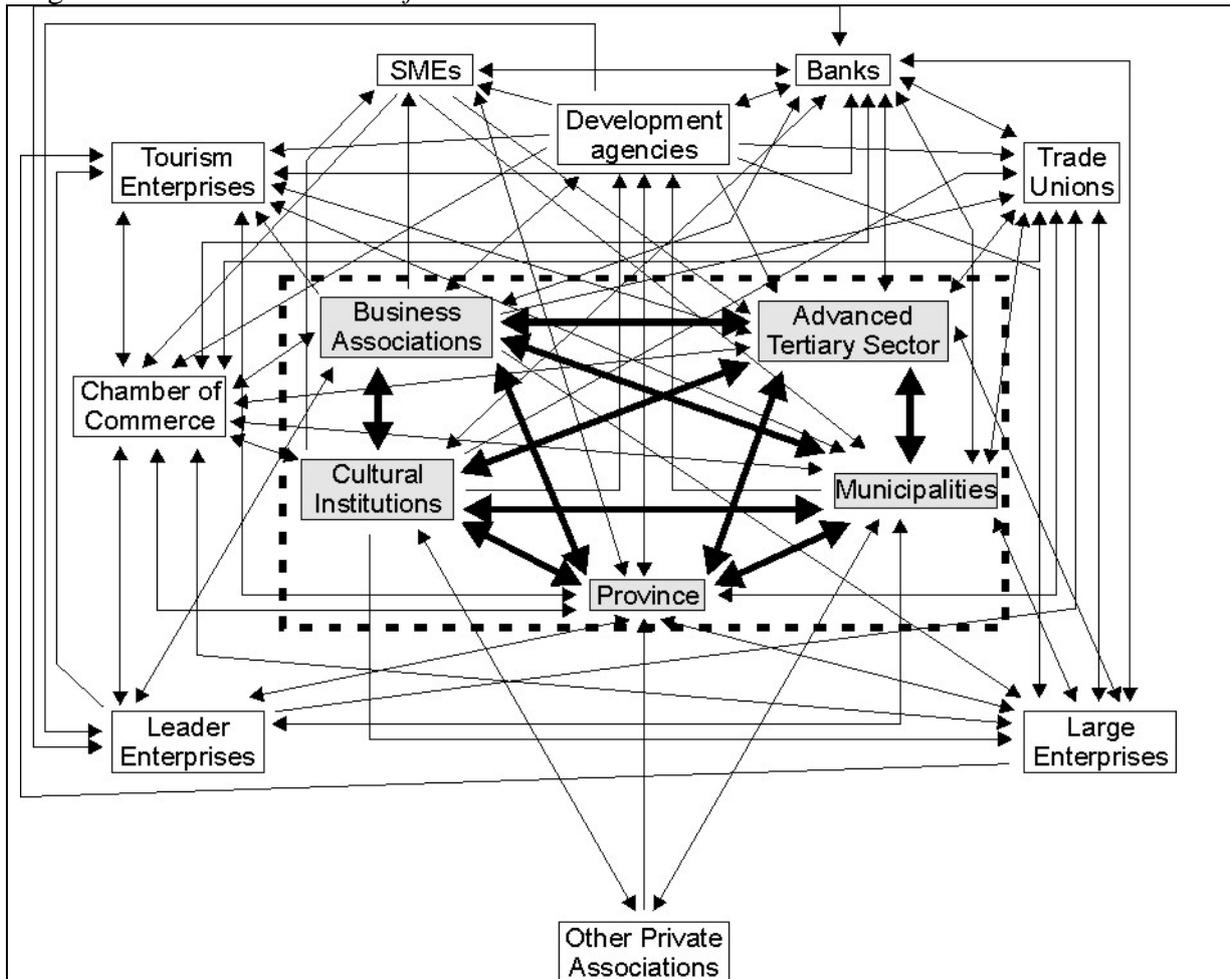
Note: N_o= Nieminen External Index (*Outdegree*); N_i= Nieminen Internal Index (*Indegree*)

Table 9: *Sabidussi and Freeman Local Indexes of the Western LTS*

ACTORS	ADIACENCY	FREQUENCY	IMPORTANCE
Province	S _c =.928 F _b =.087	S _{co} =.866 S _{ci} =.481 F _b =.087	S _{co} =.866 S _{ci} =.481 F _b =.087
Municipalities	S _c =1.00 F _b =.154	S _{co} =1.00 S _{ci} =.500 F _b =.154	S _{co} =1.00 S _{ci} =.500 F _b =.154
Development Agencies	S _c =.928 F _b =.022	S _{co} =.866 S _{ci} =.393 F _b =.022	S _{co} =.866 S _{ci} =.393 F _b =.022
Chamber of Commerce	S _c =.928 F _b =.020	S _{co} =.722 S _{ci} =.464 F _b =.020	S _{co} =.722 S _{ci} =.464 F _b =.020
Cultural Institutions	S _c =.928 F _b =.035	S _{co} =.928 S _{ci} =.393 F _b =.035	S _{co} =.928 S _{ci} =.393 F _b =.035
Leader Enterprises	S _c =.812 F _b =.004	S _{co} =.722 S _{ci} =.419 F _b =.004	S _{co} =.722 S _{ci} =.419 F _b =.004
Large Enterprises	S _c =.812 F _b =.004	S _{co} =.722 S _{ci} =.419 F _b =.004	S _{co} =.722 S _{ci} =.419 F _b =.004
SMEs	S _c =.722 F _b =.001	S _{co} =.691 S _{ci} =.406 F _b =.001	S _{co} =.619 S _{ci} =.406 F _b =.001
Advanced tertiary sector	S _c =.928 F _b =.000	S _{co} =.071 S _{ci} =.928 F _b =.000	S _{co} =.071 S _{ci} =.928 F _b =.000
Banks	S _c =.866 F _b =.032	S _{co} =.812 S _{ci} =.448 F _b =.032	S _{co} =.812 S _{ci} =.448 F _b =.032
Tourism Enterprises	S _c =.764 F _b =.006	S _{co} =.684 S _{ci} =.433 F _b =.006	S _{co} =.684 S _{ci} =.433 F _b =.006
Business Associations	S _c =.928 F _b =.022	S _{co} =.928 S _{ci} =.433 F _b =.022	S _{co} =.928 S _{ci} =.433 F _b =.022
Trade Unions	S _c =.565 F _b =.000	S _{co} =.565 S _{ci} =.448 F _b =.000	S _{co} =.928 S _{ci} =.433 F _b =.000
Other Private Associations	S _c =.565 F _b =.000	S _{co} =.565 S _{ci} =.361 F _b =.000	S _{co} =.565 S _{ci} =.361 F _b =.000

Note: S_c= Sabidussi Local Index (*Closeness*); S_{co}= Sabidussi Local Index (*OutCloseness*); S_{ci}= Sabidussi Local Index (*InCloseness*); F_b= Freeman Local Index (*Betweenness*).

Figure 4: Network Structure of the Western LTS



Note:

- Network area with high density indexes
- ▒ Actors with high centrality indexes
- One way informative collaborative relationships with low centrality indexes
- ↔ Bidirectional informative collaborative relationships with low centrality indexes
- ➔ One way informative collaborative relationships with high centrality indexes
- ↔ Bidirectional informative collaborative relationships with high centrality indexes

Furthermore, the analysis of the centrality index in terms of *betweenness* shows that *Municipalities*, the *Province of Lecce* and to a lesser extent also the *Banks* (in the *Capital LTS*), the *Advanced Tertiary Sector* (in the *Coast LTS*), the *Chamber of Commerce* (in the *Upcountry LTS*) and *Cultural Institutions* (in the *Western LTS*) are the actors that mostly interpose themselves in the relationships, thus displaying a high level of power intermediation in the whole *network*. It is reasonable to contend that the high levels of *density* and *network centralization* indexes and the important centrality of such actors as *Municipalities*, *Province*, *Business Associations* and *Banks* could be caused to their nature of institutional or public body. They discharge, by definition, coordination, administration and management functions of the territorial resources, thus determining the unavoidable occurrence of a relational structure among the actors, substantially due to administrative and bureaucratic relationships. The merely formal nature of relationships established among

public and private actors is confirmed by the reductive effect of the strength and regularity of ties which characterizes the connectivity of the considered systems. Moreover, the high level of connectivity could be mainly due to supply and sub-contracting relations: these ties do not represent synergic exchanges able to develop invisible resources and to share know-how, but are merely repetitive and necessary commercial relationships. On the other hand, noteworthy is, instead, the prominent role of both the *Advanced Tertiary Sector* – organizations specialized in IT, marketing, research and development and legal, technical and financial consulting – as it offers extensive support to primary industrial activities, and of the *Cultural Institutions* – universities, museums – as they seem to play an essential role in the dissemination and promotion of cultural and intellectual interactions. In the contemporary innovation-driven economies, the relationships between knowledge resources – universities, research and cultural institutions – and all the other territories’ resources are deemed to be essential to achieve the so-called “knowledge-based” local development (Cooke 2002; Lo and Schamp 2003). Regional knowledge networks can attract public and private knowledge resources and therefore develop into local economic development.

The *systemic rationality* showed by the *network* structure revealed that the subjective power of the most central actors – *Municipalities*, *Province* and *Business Associations* – does not succeed to modify typical rigidities of LTSs. They partially acknowledge ultimate objectives of influential actors and tend to follow laws of functioning which are internal to the system. Therefore, the actual power of the actors becomes a mere formal administrative and bureaucratic control, which has a marginal decisions making influence. When a continuous dialectic among subjective and systemic forces occurs, the ultimate aim of the development of LTSs is the result of a compromise between them. This widespread occurrence of more formal than substantial relationships can be risky because, instead of benefit from both the inertial and the subjective force of the system, it can lead to an opposite situations which encompasses the disadvantages of both parts. In contrast to the suggestion proposed by Granovetter (1973), concerning the “strength of weak ties”, in the context of regional networks, feeble or discontinuous relations do not encourage a development process (Fritsch and Kauffeld-Monz, 2010; Krätke and Brandt, 2009), but rather impede it. At the end of eluding this risk it could be desirable not to increase the amount of relationships but to make them more substantial. The achievement of actual relationships of cooperation (Semlinger 2008), and not of undemanding informative exchanges, and an improvement of the district ties between companies existing in the STLs could set up a system of concrete and productive collaborations not only among the enterprises but also among all the actors of the network, which could benefit directly or indirectly from this greatest productivity.

CONCLUSIONS

The *network* considered as a whole, showing high level of centralization indexes and a modest degree of hierarchisation around its primary actors – *Municipalities*, *Province*, *Business Associations*, *Cultural Institutions* and the *Advanced Tertiary Sector* – reveals a moderately hierarchical relational structure, in coherence with a *systemic rationality*.

The four LTSs located in the Province of Lecce have the potentiality to reach efficacious operating conditions and reinforce their competitiveness. Expectantly, they could develop into an *evolutionary rationality*, in which all the parties, characterised by conflicting or opposite interests, take mutually dependent choices, “compete and cooperate” in order to achieve a shared benefit. Therefore, it would be desirable to foster the presence of

centralizing forces with tasks of coordination and guide, and, furthermore, to promote the stability and concreteness of the existing relational ties. The emergence of actual cooperative relationships, and not merely the presence of simple informational exchanges, would make synergic and productive relations possible, in relation to the knowledge and capacity of LTSs to accelerate their own developmental process.

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