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Structural social capital and hotel performance: Is there a link?

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ABSTRACT

This paper attempts to fill three gaps how to: (i) operationalize the concept of structural social capital (SSC) for hotels; (ii) compare the effectiveness of different SSC measures at collective level; (iii) observe the ability of SSC to influence organizational performance.

Six hypotheses were tested using the Livigno (Italy) hotel sector (84 cases). The results suggest that SSC is the strongest positive determinant of hotel performance, compared with weaker and generally not significant relations linking occupancy and control variables (category, size, location). The work shows the multifaceted nature of SSC.

The topological network structure appears to be the powerful lever to manage seasonality for both well and poorly located hotels. In fact the correlation between SSC and performance is higher in off-peak periods. Findings confirm that social capital is a valuable asset, able to impact on performance. We conclude by identifying some research gaps.

1. Introduction

A firm's ability to survive and develop is closely related to the results it achieves. Actual performance outcomes are the test of any strategy, and performance improvement lies at the heart of strategic management (Sainaghi et al., 2013).

To achieve good results, hotels must manage a wide set of relationships useful to access resources and information (Nahapiet and Ghoshal, 1998), to complete their product with other local attractions (Sainaghi, 2006) and to sell their service (Xiang and Pan, 2011). Hotels are, therefore, embedded in a complex social system more often described as a network involving a large number of co-producing actors delivering a variety of products and services (Haugland et al., 2011).

For hotels located in a tourism destination, this network primarily includes relationships with other local companies, such as other lodging firms, but also a wide set of other organizations, including travel agencies and tour operators, cultural companies, entertainment firms, destination management organizations, local associations, etc. Relationships between firms are complex and may vary between collaboration (Arnaboldi and Spiller, 2011) and competition (Claver-Cortés et al., 2006).

Some sociologists suggest that organizational behaviors are closely embedded in networks of interpersonal relations (Granovetter, 1973, 1985) and discuss the concept of social capital (Coleman, 1988, 1990), as a factor able to influence firms' competitive advantage and performance (Podolny and Baron, 1997). Although important differences persist among scholars regarding what exactly social capital is (Adler and Kwon, 2002; Payne et al., 2011), a broad consensus is emerging that social capital is a valuable asset and that its value stems from the access to resources it engenders through an actor's social relationships (Granovetter, 1992).

Nahapiet and Ghoshal (1998) define social capital as the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network (Bourdieu, 1986; Burt, 1992). These authors introduce the distinction between structural and relational social capital. The former refers to the overall pattern of connections between players (Burt, 1992). The most important facets of this dimension include the presence or absence of network ties between actors (Scott, 2000; Wasserman and Faust, 1994); network configuration (Krackhardt, 1992) or morphology (Tichy et al., 1979).

Researchers have examined social capital at multiple levels of analysis, primarily as it influences individual and collective outcomes (Payne et al., 2011). Studies focusing on the first stream have analyzed various outcomes such as compensation (Seibert et al., 2001), placement on a board of directors (Lester et al., 2008), knowledge creation (McFadyen and Cannella, 2004). Examples of papers

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occurring at the collective level include entrepreneurship (Shane and Stuart, 2002), IPO failure (Fischer and Pollock, 2004) and firm competitiveness (Wu, 2008).

Despite a growing attention to describing the lodging environment as a social network and applying to it network metrics (Baggio et al., 2010a, 2011), there is a gap in hospitality literature in exploring social capital effects on hotel performance. Few papers have explored the potentiality of social capital (Brien and Smallman, 2011) and in these, focus is primarily on *individual* themes, such as contingent labor (Brien, 2010), education of hotel managers (Barros and Santos, 2009), intellectual capital (entrepreneurship) (Kalnins and Chung, 2006; Ramos-Rodríguez et al., 2012; Zhao et al., 2011), organizational trust (Brien et al., 2012), knowledge sharing (Kim et al., 2013), reactions of local residents to tourism development (Park et al., 2012).

Recently Zhao, Ritchie and Echtner concluded that: "the application of the social capital concept in tourism research is comparatively lacking" (2011, p. 1571). We may reinforce this conclusion, adding that these few studies focus largely on individual level. Therefore the relationship between social capital and hotel performance is completely unexplored.

But to contribute to fill this gap, a first problem relate to how to measure social capital. As aptly noticed by McGehee et al. (2010), the concept is difficult to operationalize. Jones (2005) refers to social capital as "a slippery concept" and assets that methodologies for measuring it are in their infancy.

Therefore, the first gap this paper attempts to fill is how to operationalize the concept of structural social capital (SSC) for hotels.

Since SSC explicitly refers to network structure, we use well-known network metrics in order to operationalize this concept.

SSC is described in literature as a multidimensional topic (Payne et al., 2011). This is not surprising because the structural dimension concerns the overall pattern of connections within a network of social relationships (Zhao et al., 2011). The most important facets of this dimension are the presence or the absence of network ties and network configuration. Ties in a social network are the source of social interaction or social exchange that is closely associated with the flow of information and resources (Coleman, 1988, 1990). Given the high number of indices that can be used to measure SSC, mainly represented by well-known network metrics (Baggio et al., 2010a), a second gap that this article contributes to filling, is the *effectiveness* of different SSC measures at collective level.

To fill this gap the study compares the ability of each measure to explain dependent variables and compare single measures with multiple metrics that combine more than one measure, in order to take into account the different aspects of the relevance of an actor in the system.

Lastly, SSC is described as a "capital", able to produce result (Baker, 1990). Tourism papers that used social capital at individual level (see citations mentioned above) explicitly explore the ability of this concept to influence outcome.

In line with this stream of research, a third gap observes the ability of SSC to influence hotel performance. We use occupancy (transformed in a logarithmic scale) as a dependent variable.

2. Literature review

2.1. Network analysis and structural social capital

A network is a set of interconnected nodes (Burt, 1992). Network analysis, derived from graph theory, attempts to describe the structure of relations (displayed by links) between given entities (displayed by nodes). Network theory assumes that firms are embedded in an economic and social system where they and their stakeholders are likely to have direct relationships with one another (Rowley, 1997). From a quantitative point of view, network analysis is able to capture some characteristics of the entire network and to position organizations in the network structure (Shih, 2006).

The application of network analysis in the social sciences began in the first half of the 20th century (Barnes, 1952; Moreno, 1934; Simmel, 1908). These approaches emphasize that actors (nodes) are embedded in a set of social relationships which have a history, and this has an effect on the actions and responses of the organizations involved (Granovetter, 1985).

Social capital initially appeared in community research studies, showing its importance for people involved in networks of strong personal relationships developing over time, able to produce trust, cooperation and collective action in such communities (Jacobs, 1965). Loury (1977) reveals the importance of social capital in family relations and the community in educating young children. While a first stage of studies focuses attention on the ability of social capital to influence human capital (Coleman, 1988), more recently a stream of research explores the relationship between social capital and firm performance (Moran, 2005).

The central proposition of the social capital theory is that networks of relationships constitute a valuable resource for conducting social affairs, providing their members with "the collectivity-owned capital, a 'credential' which entitles them to credit, in the various senses of the word" (Bourdieu, 1986: 249).

There is no agreement in literature on what kind of network structure is "best" (Gargiulo and Benassi, 2000). On the one hand, Burt (1992) argues that the benefit of social capital stems from non-redundant ties (structural holes). Burt's approach is strongly linked to Gronovetter's (1973) seminal work on weak ties, which are more likely to act as bridges than strong ones. On the other hand, Coleman (1988, 1990) suggests that closed networks (i.e. redundant ties) facilitate the accrual of obligations and favor social cohesion. More recently Latora et al. (2012) suggest that social cohesion and structural holes are two sides of the same coin.

Some researchers (like Baker, 1990) define social capital limiting the term to only the structure of the relationship networks, whereas others, such as Bourdieu (1986, 1993), also include in their conceptualization the actual or potential resources which can be accessed through such networks. In this work we explicitly refer to Nahapiet and Goshal's (1998) definition; according to this work, social capital is the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit.

As a set of resources rooted in relationships, social capital has many different dimensions (Putnam, 1995). Granovetter introduced the distinction between structural and relational social capital. Structural social capital refers to the impersonal configuration of linkages between people or units (Moran, 2005). For this reason this first concept refers to the network as a whole, for example in its configuration (Krackhardt, 1992) or morphology (Tichy et al., 1979).

Structural social capital's (SSC) impact on performance has been studied at multiple levels, ranging from the individual and small groups (Burt, 1992) to larger organizations, including firms (Tsai and Ghoshal, 1998). With the growing importance of networks in the business world, the way in which SSC contributes to firm performance has attracted increasing attention (Arregle et al., 2007; Burt, 2007; Leana and Pil, 2006). Andersson et al. (2002) found a positive relationship, while Rowley et al. (2000) revealed a negative link.

Given the importance of this research topic and the divergent empirical results on the direct effects of SSC on performance in the existing literature, the findings of the current study are expected to enrich this pool of growing knowledge of the direct effects of SSC on firm performance.

HP 1. SSC is able to positively affect hotels' performance.

2.2. Network analysis methods

A central issue is how to measure the SSC. Starting from the idea that a complex system can be modeled by representing it as a network of elements (vertices, nodes) connected by some kinds of relationships (links, edges), scholars have analyzed a large quantity of data, mostly made available through electronic systems, explained their structural and dynamic characteristics, and derived theoretical models (Barrat et al., 2008; Boccaletti et al., 2006; Newman, 2010).

In general, the geometric object graph (dots connected by lines) is represented by a matrix A (termed adjacency matrix) whose elements are assigned a value when nodes *i* and *j* are connected by a link (value is 1 if no particular weight is assigned to the link).

The use of an adjacency matrix makes it possible to investigate network characteristics by implementing the powerful methods of linear algebra. Researchers have defined a wide set of key indicators to measure these properties (da Fontoura Costa et al., 2007; Degenne and Forse, 1999; Freeman, 1979, 1980; Pavlovich, 2003). Among them, the most widely used are: (i) degree centrality, the normalized number of connections each node has, which reveals how critical an organization is within the network's global structure; (ii) closeness, which assesses the capacity of a node to reach all other nodes in the network; (iii) betweenness, which measures the extent to which a node acts as connector between different parts of the network; (iv) clustering coefficient, which measures the local density of connections in a node's neighborhood; (v) local efficiency, which provides a measure of the ability of the node to transfer information to the rest of the network; (vi) eigenvector centrality, which assigns a score to a node based on the connectivity pattern of its neighbors; and (vii) hierarchical measures, that allow for the topology of a node's connections by layering the network according to the distance from the node considered.

Despite the large array of quantitative measurements found in literature, it must be noted that no single metric has ever been proposed that is able to represent by itself the different concepts connected with the intuitive idea of relevance or importance of a network element (Bianconi et al., 2009; da Fontoura Costa et al., 2007), either from a static or a dynamic point of view (Wasserman and Faust, 1994). Moreover, while some of them are often highly correlated in real networks, others are shown to be "independent" representations of some nodal or system feature (Bounova and de Weck, 2012; Landherr et al., 2010). A number of proposals have therefore been put forward using combinations of multiple metrics in order to take into account the different aspects of the relevance of an actor in the system (Cooper et al., 2009; Hu et al., 2010; Zhang and Wu, 2011). These observations support the following hypothesis.

HP 2. A combination of multiple metrics in measuring SSC is more effective than single indicators.

2.3. Structural social capital and hotel location and seasonality

This paragraph links SSC and two key characteristics of hotels: seasonality and location. It is interesting to analyze if SSC is able to influence and useful to manage the problems of seasonality and location.

Seasonality is one of the main aspects affecting tourism (Bar-On, 1975) and it produces economic effects in terms of private and social costs, which usually largely exceed the few benefits (Baum and Hagen, 1999; Butler, 2001).

In literature there are many definitions of seasonality (Koenig and Bischoff, 2004) which, generally speaking, consists of the systematic movement of a variable in a selected period of time (Hylleberg, 1992). Some contributions stress the regularity of demand fluctuation over the years (Bar-On, 1999), while others suggest that the seasons themselves are not fixed (Rosselló et al., 2004; Wilton and Wirjanto, 1998). There are different forms of seasonality; Butler and Mao (1997) distinguish three kinds: one-peak, two-peaks and non-peak.

The reasons for a significant variation in demand are well documented: natural and institutional factors (Bar-On, 1975), social pressure or fashion, sporting calendars, and inertia or tradition (Butler, 1994). From a supply-side view, seaside destinations (Fernandéz-Morales and Mayorga-Toledano, 2008) or peripheral firms (Jeffrey and Barden, 1999) account for a higher seasonality.

Demand fluctuation is mainly perceived as a problem with serious implications for the main stakeholders involved in the hotel experience (Fernandéz-Morales, 2003). The negative impacts for companies stem from unused capacity and related inefficiencies, which restrict return on investment (Sainaghi and Canali, 2011). The workers in the hospitality sector typically accept seasonal jobs, without the usual protection required by labor contracts, and long periods of unemployment (Cuccia and Rizzo, 2011).

Given these negative effects generated by seasonality, the following two hypotheses will explore the ability of SSC to influence demand fluctuation.

HP 3. SSC is able to positively affect hotels performance both in peak and off-peak.

HP 4. SSC generates a stronger effect on hotels performance in off-peak.

Location is identified by some authors as the strongest determinants of hotel performance (Baum and Haveman, 1997).

Location is of primary importance in the hotel industry because it determines proximity and convenience to points of tourist interest or business activity and proximity to competitors in highly localized competitive arenas. Consequently, incentives for locating near other hotels (i.e., economies of agglomeration and geography) must be traded off against localized competition with neighboring hotels (Baum and Mezias, 1992; Yang, 2012).

Compared with enterprises in manufacturing industry, their counterparts in service industries, such as hotels, rely heavily on an effective location strategy to succeed in the competition to attract hotel guests to rent their rooms (Yang et al., 2012). An appropriate location is of paramount importance as it will be difficult and extremely costly for hotels to relocate and reconfigure their product offerings (Urtasun and Gutierrez, 2006). A strategic location will undoubtedly promise well for superior performance by the hotel in terms of revenue generation, in the short as well as long term (Nicolau, 2002).

Bull (1998) asserts the importance of location (in terms of access to/distance from particular places, intrinsic site characteristics and neighborhood characteristics) for product differentiation in the hospitality and tourism sectors (which produce "place-sensitive products") both theoretically and empirically.

Location is therefore relevant for hotels independently to the specific destination where they operate, such as beach (Rigall-I-Torrent et al., 2011), cities (Shoval et al., 2011), central business district (Lee and Jang, 2012). Given the importance on location, two hypotheses refer to it.

HP 5. SSC is able to positively affect performance for both hotels located in central and peripheral blocks of tourism destination.

HP 6. SSC generates a stronger effect on performance for hotels located in peripheral blocks of tourism destination.

3. Materials and methods

3.1. The Livigno network

Livigno is an alpine destination that receives roughly one million annual overnight visitors per year, primarily during the winter season. This small town (approximately 6000 inhabitants) is located at 1816 m; this altitude assures abundant snowfalls and a potential long snow season from the end of November to the beginning of May. Livigno is a duty free area located 240 km from Milan, the Italian financial capital, and 280 km from Munich (Southern Germany). The destination is accessible by car and bus, with some visitors flying to and from nearby airports.

Livigno village has a linear development along the Spoel River. Both mountain slopes (west and east) are intensively used for ski activities and, given the linear shape of the village, many lodging firms are closely connected to ski infrastructures as well as to main walking paths in summer. In contrast duty free shops are primarily based in the village center, providing a location advantage for lodging firms that are centrally located.

The network of the tourism actors in Livigno was assembled by using a number of different sources. Following the work of other scholars, the stakeholders included in the analysis are those running core tourism activities (hospitality, intermediation, transport, sport or other tourism-related services) together with the public organizations and associations active in the field. The main source for the list is the Livigno Tourism Board. Such sources of evidence are widely used in tourism and hospitality research (Baum and Mezias, 1992).

The connections were identified by examining public records: association listings, management board compositions, travel agency catalogs, marketing flyers and brochures, official corporate records (to assess co-ownerships), consortia listings, and other cooperation agreements established more informally, for example through website hyperlinks. The links thus collected reflect basic business relations between the organizations considered. A further verification was conducted through a series of in-depth interviews to knowledgeable informants: director of the tourism board, director of the local hotel association, two travel agencies, and a tourism consultant (see Baggio et al., 2010b for an extended discussion on data collection methods).

This triangulation method (Olsen, 2004) made it possible to validate the data collected and to complement the network with other connections. Regarding the stakeholders included in the list, the network may be reasonably estimated to be about 90% complete.

3.2. Structural social capital

The analysis conducted in this work was performed in two steps. The network representing a tourism destination (Livigno, Italy) was built and the main metrics for the network calculated. The hospitality component was then extracted.

In our network, each node is represented by an organization – firm or nonprofit organization. The links between them have been classified as follows:

- information link: in the web page of one node represented by a profit firm there is a link with the web page of another profit firm (e.g. another hotel, or ski company);
- institutional link: the web page of one node represented by a profit firm provides link with the web page of a nonprofit organization (e.g. DMO or associations);
- commercial link: includes links with agencies, the presence of commercial agreements between firms or the use of the same brand;
- family link: includes links with other firms that are managed by members of the same family;
- ownership link: includes links between nodes that have the same owners.

In order to measure *structural* social capital we used these links to create two different kinds of indicators:

- single measures widely used in literature to measure SSC: degree (Ndeg), closeness (Clos), betweenness (Betw), local efficiency (Eloc), hierarchical clustering coefficient (HClCf), eigenvalue (Eigenv) and hierarchical convergence ratio (HCnvR) (da Fontoura Costa et al., 2007);
- a salience indicator calculated as the geometric mean of the normalized metric values mentioned previously (degree, closeness, betweenness, local efficiency, hierarchical clustering coefficient, eigenvalue and hierarchical convergence ratio) (Hu et al., 2010; Zhang and Wu, 2011). This indicator is able to capture the topological network structure and operationalize the definition of structural social capital such as the impersonal configuration of linkages between people or units (Nahapiet and Ghoshal, 1998).

The two sets of indicators – single measures and salience indicator – for hospitality firms were extracted and compared with their average occupancy over a period of three years. The whole sample examined comprises 84 cases and is essentially complete; a few cases were discarded due to the impossibility of calculating their network metrics for their completely isolated positions.

3.3. Control variables and dependent variable

In order to control the effects generated by some strategic variable on hotel performance, three measures were used: size, category and location (Baum and Mezias, 1992; Ingram, 1996; Urtasun and Gutierrez, 2006; Baggio and Sainaghi, 2011).

Size is identified in many studies as a powerful determinant of firm performance, given the positive relationship between dimension and economies of scale (Barros, 2004; Chen and Tseng, 2005). An exception is a study that focuses on individual hotels operating in a business destination (Sainaghi, 2011), or other empirical findings suggesting diseconomies of scale (Anastassopoulos et al., 2009). Size (SIZ) has been operationalized using the number of beds. In alpine destinations, in fact, hotels sell beds and not rooms.

Category is used as a determinant in a large set of studies. Empirical findings suggest a direct and positive relationship with performance (Chand and Katou, 2007). This variable is usually operationalized by using the official star classification (star rating). Following this suggestion, category (CAT) is measured by the number of stars.

Interesting conclusions concerning *location* are found in a study by Baum and Mezias (1992) who suggest the central role that location plays for hospitality firms. Location may be measured using a street-avenue grid (Baum and Haveman, 1997), subjective geographic areas (Urtasun and Gutierrez, 2006), or proximity to relevant attractions (Ingram and Inman, 1996). In this study, location (LOC) has been measured using a geodesic distance between each hotel and some relevant tourist attractions. During the winter season clients are primarily interested in skiing. For this reason the research group has calculated the distance between each hotel and each skiing infrastructure, choosing the smaller metric value (Dski). During the summer season, tourists are more sensitive to central area, the distance has been calculated assuming the central place ("Plaza dal Comun") as a focal point (Dcentre).

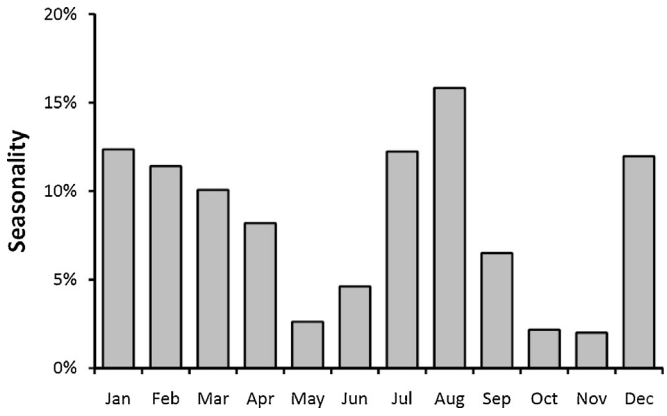

Fig. 1. Seasonality of tourist arrivals to Livigno.

Finally, the dependent variable is represented by *occupancy*. In the literature of hotel performance, results are usually measured by using both financial and operating measures (Gray et al., 2000; Reichel and Haber, 2005; Sainaghi, 2010). However, some studies suggest a stronger relationship between determinants and operating measures, given the synthetic nature of financial indicators (Chung, 2000), which are often influenced by managerial and accounting adjustments. Operating indices are usually built around occupancy (Jeffrey and Barden, 2001), sales (price) (Danziger et al., 2006), or combined in the revenue per available room (REVpar) (Namasivayam et al., 2007). Each measure has its own advantages and weaknesses (Brown and Dev, 1999; Cizmar and Weber, 2000; Enz and Canina, 2002). This work uses occupancy due to the low price variations inside the destination once corrected for both category and location.

The dependent variable is a percentage that divides the number of sold beds over the capacity. The occupancy, therefore, does not show a normal distribution; for this reason the variable has been transformed in a logarithmic scale (LnOccup) (Anderson, 2010).

For testing hypothesis 3 and 4 (seasonality), annual occupancy (LnOccup) has been articulated in two different periods, reflecting low (LnOccupL) and high (LnOccupH) seasonality.

In fact, as Fig. 1 shows, the seasonality effect is quite clear (data refer to the last three years and were provided by the local Tourism Board).

It is possible to define two main seasons: high season, comprising the months of December, January, February, March, July and August, and low season (April, May, June, September, October, November).

4. Results

4.1. The Livigno network

Fig. 2 shows the resulting network (SSC) along with its degree distribution. The analysis of the network's main metrics and a comparison with those found in the literature for other systems (see for example da Fontoura Costa et al., 2011) shows that Livigno has a relatively small degree of connectivity (density of links, $d = 0.01$), a high proportion of disconnected elements (10.1%) and a good compactness (diameter and average path length: $D = 6$, $L = 2.48$). The moderately high clustering coefficient (CC = 0.35) testifies to a slight tendency to form cooperative groups among the different tourism operators.

The form of the statistical distribution of the degrees k in a network is a fundamental element of its topology and plays an important role in many aspects of its structural and dynamic behavior (Newman, 2010). The cumulative degree distribution $N(>k)$ for the Livigno network is shown in Fig. 2. The fit was obtained by using a maximum-likelihood method combined with goodness-of-fit tests based on the Kolmogorov–Smirnov statistic, following the method proposed by Clauset et al. (2009). The degree distribution functional form is consistent with a power law: $N(k)$ k-, with = 2.36 0.28 (dotted line in Fig. 2).

A power-law distribution essentially means that a few elements of the network have a large number of connections, while the majority have few. This non-homogeneous distribution (also termed scale-free for the absence of a typical scale which in random distributions is associated with the average degree) is commonly considered an indicator of the complex nature of the system responsible for peculiar dynamic responses to a number of processes, such as the diffusion of information, sensitivity to external or internal perturbations, or the capacity to self-organize producing hierarchical structures (Newman, 2010).

4.2. Descriptive statistics and correlation matrix

Before testing the six hypotheses, a descriptive analysis was conducted with the aim to clarify both the meaning of the variables (independent, control and dependent) and to describe the Livigno situation (Table 1).

Given the high non-normality of many of the variables used in this study, a Spearman's rank correlation has been chosen for the different tests. As known, this technique is able to uncover any type of monotonic correlation between the variables (this has been visually verified by looking at the correlation plots),

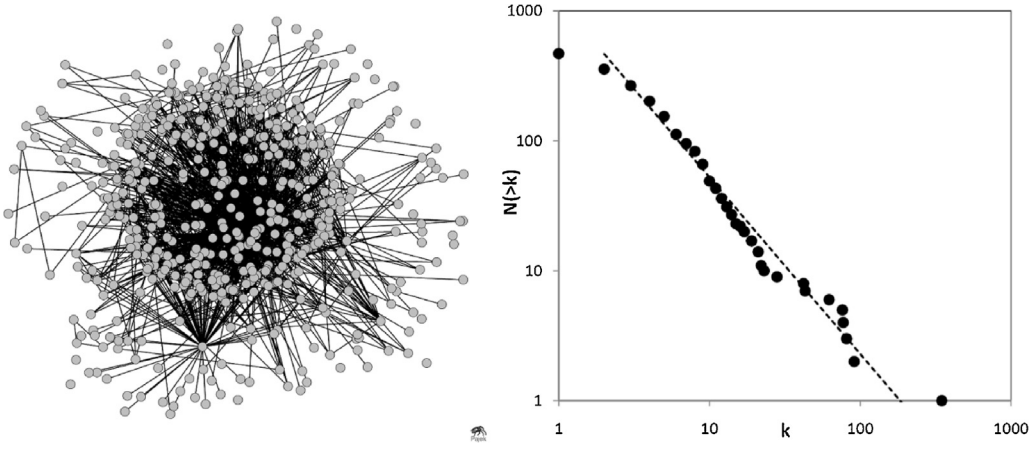

Fig. 2. The Livigno detination network along with its cumulative degree distribution (dotted line represents the power-law fit).

Table 1
Descriptive statistics.

Variables	Mean	Std. deviation	Median	Interquartile range
1. Independent variables				
(1) Net_U	0.111	0.036	0.107	0.057
(2) Ndeg	7.012	3.545	6.000	5.000
(3) Betw	0.001	0.002	0.000	0.001
(4) Eigenv	0.066	0.018	0.066	0.024
(5) HCnvR	6.378	0.666	6.384	1.180
(6) HClCf	0.480	0.219	0.421	0.264
(7) Clos	0.400	0.019	0.402	0.010
(8) Eloc	0.545	0.202	0.517	0.363
2. Control variables				
(9) SIZ	45.580	54.724	37.000	33.000
(10) CAT	3.010	0.577	3.000	0.000
(11) Dcentre	1159.040	1135.895	972.917	1173.017
(12) Dski	296.458	487.141	190.145	120.651
3. Dependent variables				
(13) LnOccup	−0.830	0.375	−0.771	0.298
(14) LnOccupH	−0.494	0.397	−0.415	0.309
(15) LnOccupL	−1.748	0.555	−1.668	0.591

independently from their distribution and not necessarily assuming a linear dependence.

The network metrics show values that are quite common among systems similar to the Livigno destination (see for example Baggio et al., 2010b). The geographical characteristics (an elongated shape at the bottom of a valley) are well represented by the two distance measures. In particular the majority of hotels are quite close to the ski areas.

Table 2 reports, in a compact way, the results of the whole correlation study. These outcomes are discussed in detail in the next sections. Here two comments are in order. First, the network measures show a number of significant correlations. This is a well-known phenomenon, due to the peculiar topology of the Livigno network (Serrano et al., 2007; Bounova and de Weck, 2012). Second, as far as the control variables are concerned, the only one showing any significant correlation with some network metrics is SIZ. This is a reasonable result if we consider that bigger firms tend to be more involved in the local network.

When the relationship between control variables and occupancy is considered, the evidences show a positive effect on occupancy but the relationship is generally small and not significant. A possible explanation is given for each control variable. Concerning size, hotels in Livigno are primarily medium-low, with few large hotels (more than 200 beds). The latter tend to favor a volume-oriented strategy, which positively affects occupancy. This observation may explain why the correlation is positive – an increase in size depicts a more volume-oriented strategy – and why the relationship is not significant – the majority of local hotels have a very similar size.

Category can influence both prices and number of attracted tourists. In Livigno a large majority of hotels are three star. Results reported in Table 2 suggest that an increase in category generates a positive relationship with occupancy, but given the low variance of the independent variable (category) the correlation is not highly significant.

Finally, location shows a low correlation and a not significant index. This could be a paradox given the importance that this variable played in previous studies (Baum and Mezias, 1992; Baum and Haveman, 1997; Urtasun and Gutierrez, 2006). The explanation is quite simple: Livigno is primarily a winter destination and winter tourists are usually skiers. The linear structure of this alpine village dramatically reduces the "location advantage" because the majority of hotels are placed very close to at least one of the ski infrastructures.

4.3. How to measure SSC (HP 1 and HP 2)

Usually a simple correlation is not reputed a sufficient reason to imply causation, unless some other conditions are met (Cook and Campbell, 1976; Hatfield et al., 2006), namely: correlation between the supposed cause and effect, temporal precedence of the cause, and ability to control or rule out alternative explanations for a possible link between cause and effect. Here we have observed a clear association, we can also dismiss some of the most common alternative explanations (location, size or category) for their much weaker correlations. Finally it is very reasonable to assume that a reverse causation is at least highly improbable. There is no evidence, for what we know, that having a high occupancy, an hotelier would seek more connections with other establishments. Finally, although it was not verified for all the connections, the establishment of linkages in the network is "older" than the recording of occupancies (the majority of them was collected from historical records).

Since this is not an "experimental" investigation, we can only resort to a randomized study (Fisher, 1935). To do that we generated a set of ten networks having the same degree distribution as the original one, but with links placed at random. This is, in network science, a common null-model. Recalculating the quantities described previously and re-running the correlations we found that (results are averaged over the ten realizations) the Spearman's correlation coefficient is 0.267 (significant at the 0.05 level) as opposed to 0.438 (significant at 0.01 level).

With this premise, quantitative data have been used to test the hypotheses; Table 3 focuses on different indicators useful to measure SSC (HP 2) and to test the relationship with annual occupancy (LnOccup).

Concerning the first hypothesis, SSC affects occupancy: the relationship is strong, positive and significant for many independent variables among which: salience indicator (Net_U, 0.438), degree (Ndeg, .405), eigenvalue (Eigenv, 0.375) and closeness (Clos, 0.221). The relationship is strongly significant for the first three variables (0.000).

No control variable was found relevant: the category shows an almost significant value (0.074), but with a considerable lower correlation (0.180). Both size (SIZ) and location are not relevant.

Focusing attention on different SSC measures (HP 2), the salience indicator shows the higher correlation coefficient (0.438), suggesting, as indicated in literature, that SSC is a multifaceted concept. For this reason, single measures are sometimes not significant or may present a small or even negative relationship (hierarchical clustering coefficient, HClCf) instead of a positive link as for all the other SSC variables.

The evidences depicted in Table 3 confirm both hypotheses: SSC positively influences hotel performance and a salient indicator is preferable to single indices.

4.4. SSC and seasonality (HP3, HP4)

This section analyzes the effects generated by SSC on seasonality. Table 4 reports the relationships found, considering occupancy divided by high and low season.

Hypothesis 3 suggested that SSC is able to positively influence the performance in high and low season. Empirical findings confirm this hypothesis: in fact the correlation coefficients are positive (0.387 in high season; 0.428 in low season) and both highly significant (0.000). The control variables do not show significant correlation in the case of location (Dcentre and Dski), suggesting that the distance from some tourist attractions is not enough to increase hotel occupancy. The same observations could be extended to size. Finally, category is not significantly correlated either with annual or high season performance, while it shows a

Table 2
Correlation matrix.

Nonparametric Correlations (Spearman's rho)	Independent								Control				Dependent			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	
Independent	Net_U (1) CC		0.907[b]	0.895[b]	0.761[b]	−0.063	−0.11	0.808[b]	−0.032	0.468[b]	0.224[a]	0.138	−0.147	0.466[b]	0.371[b]	0.397[b]
	Sig. (2-tailed)		0	0	0	0.567	0.319	0	0.774	0	0.041	0.209	0.182	0.000	0.001	0.000
	Ndeg (2) CC	0.907[b]		0.722[b]	0.894[b]	−0.139	0.043	0.890[b]	−0.162	0.610[b]	0.288[b]	0.161	−0.207[a]	0.449[b]	0.407[b]	0.474[b]
	Sig. (2-tailed)	0.0000		0	0	0.171	0.673	0	0.127	0	0.004	0.111	0.04	0	0	0
	Betw (3) CC	0.895[b]	0.722[b]		0.549[b]	0.009	−0.299[b]	0.632[b]	−0.389[b]	0.483[b]	0.235[a]	0.118	−0.01	0.356[b]	0.267[a]	0.281[b]
	Sig. (2-tailed)	0	0		0	0.934	0.004	0	0	0	0.027	0.27	0.922	0.001	0.011	0.008
	Eigenv (4) CC	0.761[b]	0.894[b]	0.549[b]		−0.055	0.008	0.880[b]	−0.112	0.465[b]	0.320[b]	0.137	−0.204[a]	0.422[b]	0.411[b]	0.468[b]
	Sig. (2-tailed)	0	0	0	−0.0550	0.589	0.94	0	0.291 0.182	0	0.001	0.177	0.044	0	0	0
	HCnvR (5) CC	0.0630	0.1390	0.0090			−0.043	−0.178	0.182	−0.024	0.032	0.056	−0.119	0.077	0.127	0.086
	Sig. (2-tailed)	0.5670	0.1710	0.9340	0.5890		0.674	0.078	0.086	0.816	0.753	0.582	0.242	0.449	0.211	0.402
	HClCf (6) CC	−0.1100	0.0430	−0.299[b]	0.0080	−0.043		0.108	0.789[b]	−0.015	−0.096	−0.194	−0.091	0.025	0.008	0.07
	Sig. (2-tailed)	0.3190	0.6730	0.0040	0.9400	0.674		0.285	0	0.886	0.345	0.054	0.372	0.805	0.936	0.496
	Clos (7) CC	0.808[b]	0.890[b]	0.632[b]	0.880[b]	−0.178	0.108		−0.195	0.552[b]	0.347[b]	0.126	−0.168	0.399[b]	0.340[b]	0.443[b]
	Sig. (2-tailed)	0	0	0	0	0.078	0.285		0.065	0	0	0.215	0.097	0	0.001	0
	Eloc (8) CC	−0.0320	−0.1620	−0.389[b]	−0.1120	0.182	0.789[b]	−0.195		−0.149	−0.179	0.008	−0.045	0.053	0.051	0.057
	Sig. (2-tailed)	0.7740	0.1270	0.0000	0.2910	0.086	0	0.065		0.168	0.091	0.942	0.674	0.619	0.632	0.597
	SIZ (9) CC	0.468[b]	0.610[b]	0.483[b]	0.465[b]	−0.024	−0.015	0.552[b]	−0.149		0.288[b]	−0.027	−0.041	0.196	0.147	0.232[a]
	Sig. (2-tailed)	0	0	0	0	0.816	0.886	0	0.168		0.005	0.795	0.695	0.056	0.155	0.025
Control	CAT (10) CC	0.224[a]	0.288[b]	0.235[a]	0.320[b]	0.032	−0.096	0.347[b]	−0.179	0.288[b]		−0.047	−0.156	0.202[a]	0.206[a]	0.229[a]
	Sig. (2-tailed)	0.041	0.004	0.027	0.001	0.753	0.345	0	0.091	0.005	−0.047	0.639	0.12	0.043	0.04	0.023
	Dcentre (11) CC	0.138	0.161	0.118	0.137	0.056	−0.194	0.126	0.126	−0.027			0.045	0.149	0.097	0.083
	Sig. (2-tailed)	0.209	0.111	0.27	0.177	0.582	0.054	0.215	0.942	0.795	0.639		0.655	0.14	0.336	0.414
	Dski (12) CC	−0.147	−0.207[a]	−0.01	−0.204[a]	−0.119	−0.091	−0.168	−0.045	−0.041	−0.156	0.045		−0.028	−0.048	−0.152
	Sig. (2-tailed)	0.182	0.04	0.922	0.044	0.242	0.372	0.097	0.674	0.695	0.12	0.655		0.78	0.636	0.136
Dependent	LnOccup (13) CC	0.466[b]	0.449[b]	0.356[b]	0.422[b]	0.077	0.025	0.399[b]	0.053	0.196	0.202[a]	0.149	−0.028		0.907[b]	0.908[b]
	Sig. (2-tailed)	0	0	0.001	0	0.449	0.805	0	0.619	0.056	0.043	0.14	0.78		0	0
	LnOccupH (14) CC	0.371[b]	0.407[b]	0.267[a]	0.411[b]	0.127	0.008	0340[b]	0.051	0.147	0.206[a]	0.097	−0.048	0.907[b]		0.842[b]
	Sig. (2-tailed)	0.001	0	0.011	0	0.211	0.936	0.001	0.632	0.155	0.04	0.336	0.636	0		0
	LnOccupL (15) CC	0.397[b]	0.474[b]	0.281[b]	0.468[b]	0.086	0.07	0.443[b]	0.057	0.232[b]	0.229[a]	0.083	−0.152	0.908[b]	0.842[b]	
	Sig. (2-tailed)	0	0	0.008	0	0.402	0.496	0	0.597	0.025	0.023	0.414	0.136	0	0	

Legend: CC = correlation coefficient. Sig. = 0 means Sig. < 10^{-3}.

[a] . Correlation is significant at the 0.05 level (2-tailed).

[b] . Correlation is significant at the 0.01 level (2-tailed).

Table 3
How to measure social capital.

Nonparametric Correlations (Spearman's rho)		Independent								Control			
		Net_U	Ndeg	Betw	Eigenv	HCnvR	HClCf	Clos	Eloc	CAT	SIZ	Dcentre	Dski
LnOcc	Correlation coefficient	0.438[b]	0.405[b]	0.163	0.375[b]	0.156	−0.0386	0.221[a]	0.060	0.180	0.146	0.017	−0.028
	Sig. (2-tailed)	0.000	0.000	0.127	0.000	0.122	0.704	0.028	0.573	0.074	0.158	0.864	0.780

Sig. = 0 means Sig. < 10^{-3}.
[a] . Correlation is significant at the 0.05 level (2-tailed).
[b] . Correlation is significant at the 0.01 level (2-tailed).

Table 4
SSC and seasonality.

Nonparametric correlations (Spearman's rho)		Net_U	CAT	SIZ	Dcentre	Dski
LnOcc	Correlation coefficient	0.438[b]	0.180	0.146	0.017	−0.028
	Sig. (2-tailed)	0.000	0.074	0.158	0.864	0.780
LnOccH	Correlation coefficient	0.387[b]	0.182	0.097	−0.036	−0.048
	Sig. (2-tailed)	0.000	0.069	0.352	0.724	0.636
LnOccL	Correlation coefficient	0.428[b]	0.222[a]	0.152	−0.062	−0.152
	Sig. (2-tailed)	0.000	0.028	0.146	0.545	0.136

Sig. = 0 means Sig. < 10^{-3}.
[a] . Correlation is significant at the 0.05 level (2-tailed).
[b] . Correlation is significant at the 0.01 level (2-tailed).

positive and significant relationship with low season occupancy (0.222*).

The correlation coefficients between hotels result and SSC (Net_U) confirm the fourth hypothesis: the structural social capital exerts a higher positive effect on low season (0.428) compared to high season (0.387).

4.5. SSC and location (HP 5, HP 6)

This paragraph focuses on the effect generated by social capital on hotels, segmented according to their location. As noted previously, this destination is primarily specialized in winter tourism, where customers are skiers. During this season, therefore, location has been operationalized calculating the distance between each hotel and the most closed ski infrastructure (Dski). During the other months, location has been measured considering the town center as the focal point (Dcentre). Central or peripheral location has been determined by using the median of the distances as cut point.

Table 5 reports the empirical findings obtained comparing the effect of SSC on occupancy when hotels are split by location.

Focusing attention on hypothesis 5, the evidences partially confirm HP 5 but only for Dcenter. In this case, in fact, the topological network structure positively affects both central- (0.293) and peripheral-hotels (0.609) (Spearman). In this last case the relationship is strongly relevant (0.000), while in the former one it is less so (0.063).

The second indicator (Dski) does not show any significant correlation with annual occupancy (LnOccup). This is not surprising given the high number of hotels closely located to ski infrastructures.

Concerning the last hypothesis and focusing attention on Dcenter Table 5 suggests that SSC is able to generate a higher effect in low season than in high season, but this correlation is found only for peripheral hotels.

5. Discussion

The destination hotels are primarily small (45.58 beds), average category (3.0 stars) and closely positioned to ski infrastructures, while the average distance to the city center is greater. This location strategy is in line with the importance of the winter season, able to originate roughly 70% of annual overnights. Control variables show a very low correlation with each other, with a small exception represented for category and star. More high quality hotels tend to be more larger. Category shows a positive correlation with occupancy; the relationship is significant, while the intensity is low. In synthesis, Livigno is populated by quite similar hotels.

Focusing attention on network metrics, the destination is characterized by power-low distribution, which means that a few elements of the network have a large number of connections, while the majority have few. In other words, what was quite similar considering control variables (size, category, location) appear different in terms of network positioning. But the key question concerns whether this difference is able to explain competitive performance or not.

The empirical findings suggest that SSC is the strongest determinant of hotel performance, compared to weaker and generally not significant relations that link occupancy and control variables. The work conducted shows the multifaceted nature of SSC and therefore the wide number of indicators necessary to measure it. However the usage of analytical single values generates a fragmented picture that can be joined together through the proposed combined saliency indicator. This measure is better suited to representing effect than single measures and produces a stronger and more significant correlation with hotel performance. This point is quite evident focusing attention on Table 3. The independent variable Net_U shows the highest coefficient, on the one hand, and does not require the complex interpretation proposed by single indicators, on the other. In synthesis, the ability to saturate the product capacity (dependent variable) is influenced more by the relationships between actors than by some strategic choices made at founding (location) or concerning quality (category) and dimension (size).

The relationships with other local companies and therefore the topological network structure appear to be the stronger lever to manage seasonality. Hotels wanting to increase their occupancy must be willing to engage in collaborative practices with other local operators in order to integrate their offer with other local suppliers. This result appears to be reasonable and confirms the composite nature of the tourism product. A possible explanation requires stressing the relevance of destination product rather than

Table 5
SSC and location.

Correlations			Pearson	Spearman
D center	Central	LnOccup correlation	0.327[a]	0.293
		Sig. (2-tailed)	0.037	0.063
		LnOccupH correlation	0.306	0.300
		Sig. (2-tailed)	0.052	0.057
		LnOccupL correlation	0.290	0.212
		Sig. (2-tailed)	0.069	0.188
	Pheripheral	LnOccup correlation	0.535[b]	0.609[b]
		Sig. (2-tailed)	0.000	0.000
		LnOccupH correlation	0.457[b]	0.405[b]
		Sig. (2-tailed)	0.002	0.007
		LnOccupL correlation	0.562[b]	0.521[b]
		Sig. (2-tailed)	0.000	0.000
D ski	Central	LnOccup correlation	0.251	0.239
		Sig. (2-tailed)	0.079	0.094
		LnOccupH Correlation	0.279[a]	0.259
		Sig. (2-tailed)	0.050	0.069
		LnOccupL correlation	0.055	0.085
		Sig. (2-tailed)	0.705	0.561
	Pheripheral	LnOccup correlation	−0.064	−0.183
		Sig. (2-tailed)	0.657	0.202
		LnOccupH correlation	−0.118	−0.282[a]
		Sig. (2-tailed)	0.416	0.047
		LnOccupL correlation	−0.195	−0.280
		Sig. (2-tailed)	0.180	0.051

Sig. = 0 means Sig. < 10^{-3}.
[a] Correlation is significant at the 0.05 level (2-tailed).
[b] Correlation is significant at the 0.01 level (2-tailed).

hotel product. Tourists are interested in destination attractions and a hotel interested in increasing the number of clients should work on product, integrating its offer with those of other local firms. For this reason the higher Net_U measure shows a positive correlation with occupancy especially in low season. It is important to note if whether the network positioning is more relevant in low season; however relationships with other firms play an important role also in high season. Both results (low and high season) confirm that hotels operating in a tourism destination are co-producing actors.

Finally, concerning location, the study shows that during the winter season the majority of Livigno hotels have a good location, very close to ski infrastructures. For this reason Dski does not significantly affect occupancy, on the one hand, and the topological network structure does not provide significant help for hotels poorly located (although the latter are few).

The results are different when considering distance from the center. The connections with other firms is a key strategic factor both for well localized (central) hotels and for those poorly located (peripheral). The former companies are involved in an highly competitive arena (center); SSC is therefore useful to widen the hotel offer and to increase the firm's visibility in order to attract more clients and increase occupancy. These observations are more relevant for peripherally located hotels and in particular during off-peak periods. Empirical findings suggest an important implication especially for peripheral hotels: firms far from the town center are asked to work intensively on network relationships, in order to enlarge their product, acquire visibility, and position their offer in the right commercial circuits. In contrast, a well-located firm (in center) does not show any significant correlation with high and low season occupancy, but a positive and significant relationship is found with annual saturation. Net_U is not able to influence the occupancy in specific periods, but is relevant to attract customers during the year. Finally, the location in winter (D ski) is not able to explain variations in occupancy, either for central or peripheral hotels. This is reasonable if we remember that the majority of Livigno firms have a close location to ski infrastructures.

6. Conclusions

This article researches the relationship between SSC and firm performance. Empirical findings make it possible to draw some conclusions at theoretical and empirical levels.

At *theoretical level*, results sustain three important conclusions. First, the research applying SSC as independent variable, finds a positive correlation with operating performance, confirms that social capital is a valuable asset and, like all kinds of capital, affects results. Previous papers use social capital more as a dependent variable (e.g. Ramaswamy and Kuentzel, 1998; George and Reid, 2005; Moscardo, 2007; Park et al., 2012), present a strong focus on tourism and not hospitality (Pongponrat and Chantradoan, 2012) and are prevalently qualitative researches (Macbeth et al., 2004; Karlsson, 2005).

Second, the present study has explored the collective level of SC, showing the potentialities of SSC (Payne et al., 2011) for understanding hotel performance. Previous literature focuses primarily on individuals (Baker and Coulter, 2007; Heimtun, 2007) or on community (George and Reid, 2005), but very rarely on firms (Jóhannesson et al., 2003). At firm level, social capital is able to positively and significantly influence occupancy and appears to be the strongest lever for owners and managers to manage the two key characteristics of hotel business: seasonality and the effects generated by location choices.

Third, the article introduces a new measure able to operationalize SSC. While previous works make a more intensive use of single measures – degree, closeness, betweenness, local efficiency, hierarchical clustering coefficient, eigenvalue and hierarchical convergence ratio (da Fontoura Costa et al., 2007) – the present study introduces a salience indicator, calculated as the geometric mean of the normalized metric values mentioned previously. This synthetically indicator shows the higher correlation coefficient. From a theoretical perspective, this result confirms the multifaceted nature of SSC (Baggio et al., 2010b), while from a methodological point of view it introduces a helpful measure to operationalize SSC.

Focusing on *empirical findings*, structural social capital constitutes a viable antecedent of lodging results. Previous studies

focused on performance determinants are more oriented toward internal variables, often ignoring the importance exerted by external factors (Sainaghi, 2010). A first important conclusion affirms that SSC is, in our research, the most powerful determinant of hotel performance, able to positively and significantly influence occupancy. Therefore it is necessary for hospitality companies to establish fruitful relationships with other companies operating in the same geographical area (destination). This work shows that positive results can be also obtained by hotels that are poorly located. Furthermore, SSC is more effective during off-peak periods or in presence of locational disadvantages.

This work obviously contains some limitations. The research object of this paper is local SSC, therefore it was not possible to explore the relevance of external ties and to compare their effectiveness compared to local ones. The connections used to measure SSC were identified by examining public records and other publicly available data. This does not enable us to understand which internal hotel processes are most affected by SSC. The evidences show that the topological network structure is able to influence performance, but this paper cannot show what processes (e.g. marketing, production, research and development, human resource management, logistic, etc.) are positively influenced by SSC. Finally, the article focuses on SSC, ignoring the possible effects generated by relational social capital.

All these limitations constitute a fruitful future research agenda to increase our knowledge of social capital, with a particular focus on the hospitality sector.

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