

**The role of social capital in regional innovation systems:
creative social capital and its institutionalization process**

Abstract

In the literature on regional innovation systems, one strand of study has identified a number of gaps that limit the efficiency and effectiveness of regional innovation systems, including so-called “managerial gaps,” “structural holes,” “innovation gaps,” and “valleys of death.” Our project aims to demonstrate how social capital, in a creative tension that balances bonding and bridging elements, may contribute to reducing these specific gaps identified in the regional innovation systems literature. This perspective is analyzed within a particular context: the Mondragon Cooperative Group in the Basque Country.

Keywords

Social capital, regional innovation systems, system gaps, Mondragon Cooperative Group

1. Introduction

Innovation is the most critical driver of territorial competitiveness in the current globalized economy (Lundvall, 2007; Asheim et al., 2011). For this reason, some countries and regions developed full innovation systems as a means to support their business system. Following Lundvall (1992) and Cooke et al. (1998:12), “the (regional) innovation system consists of elements and relationships that interact in the production, diffusion and deployment of new and economically useful knowledge”. This system is a “learning economy” that pulls together multiple agents, with their various functions, including policy that “can assist such processes... as the related learning-by-doing, by-using and b-interacting” that arise in the system (Idem:14). However, recent research has shown that innovation and competitiveness are not automatic effects of resource-intensive territorial development strategies and policies. There are situations in which an “innovation paradox” arises (Edquist, 2005), that is, significant innovation inputs (e.g., R&D expenditure and human capital) do not produce relevant innovation outputs. This may have several explanations, which some scholars connect primarily to different territorial/institutional contexts and approaches to innovation (Tödting and Tripl, 2005; Lundvall, 2007; Rodríguez-Pose, 2013; Isaksen and Tripl, 2016; Parrilli and Alcalde, 2016), and others connect also to specific system failures or gaps that occur

among the agents that form the regional innovation systems (RISs) (Nauwelaers, 2011; Alberdi et al., 2014).

Our contribution is positioned within this second stream of research as we seek to introduce a value-adding approach to the discussion on the inefficiencies of RISs or, alternatively, on the successful formation of a RIS that depend on building up effective relationships between agents in the system. With this objective in mind, we introduce social capital (SC) as a context-specific driver of competitiveness and economic development based on shared values, norms, routines, and practices across a localized population of socioeconomic agents (Putnam, 1993; Fukuyama, 1995; Ostrom and Ahn, 2008; Becattini et al., 2009; Parrilli, 2009). In general, SC activates economic development in regional systems as it promotes cooperation and a joint sense of responsibility toward local economic development (“civicness” in Putnam, 1993).

Nevertheless, the role of SC in regional development remains controversial. Following Pihkala et al. (2007), SC seems to have a positive effect on regional development and renewal processes. This is true for Putnam’s (1993) “trust [that] lubricates cooperation,” and for Beugelsdijk and Van Schaik (2005), who consider that higher levels of trust usually lead to higher levels of cooperation, which are essential to the process of innovation (Rutten and Boekema, 2007). Recent studies have also found the relevance of SC in supporting innovation through knowledge transfer in small and medium enterprises (SMEs) (Padilla-Melendez et al., 2012) and that the quality of regional

government, which relies on SC (trust) and institutional factors, is positively correlated to regional innovation performance (Rodríguez-Pose and Di Cataldo, 2015).

However, Florida et al. (2002) argue that a high SC stock does not foster innovation and creative processes. Likewise, Frombold-Eisebith (2002: 8) states that the general purpose of SC is “to sustain elements of stability and reliability in an environment of change”; instead, Svendsen and Svendsen (2004) stress the positive effects on the RIS of a destruction of (homogeneous) SC. In all these cases, it is clear that SC dynamics affect the performance of RISs.

Therefore, the relevant research question is how shall SC be developed so as to have positive effects on RISs, thus reducing the relational gaps (among agents) that affect the effectiveness of RISs? For this purpose, we benefit from Sotarauta and Lakso’s (2000) concept of “creative social capital” (CSC) for regional development. CSC helps to enhance regional innovation dynamics by means of a virtuous balance between bonding and bridging SC, where the first is taken as a community inward-oriented SC and the second as a cross-communities outward-led SC. When a balanced combination of both is preserved, the “creative tension” needed to foster innovation is guaranteed. Therefore, this paper proposes an integration of the SC construct along with the institutionalist perspective so as to lead to more efficient and effective RISs.

This paper explores the role that CSC has in addressing specific gaps identified in RISs, thus in forming a more complete RIS. First, it shows how CSC helps to address such gaps as a result of a gradual grassroots-led process that progressively activates collaborative mechanisms oriented to bolster innovation. Second, the paper analyzes the institutionalization processes of CSC, where institutions are defined as the formation of explicit and implicit or unwritten norms, routines, and practices that different economic agents share and that help them understand and legitimize one another and promote joint actions and collaborations (North, 1990). This institutionalization process, particularly among SMEs, occurs within a “collective action model” (Hargrave and Van de Ven, 2006), which helps to maintain a more efficient and effective RIS over time. As a result of these continuous processes (Giddens, 1984; Barley and Tolbert, 1997), CSC takes a formal institutional configuration or configures an institutionalized dynamic to close RIS gaps in a sustainable manner.

These complex processes are analyzed through case studies selected within a particular sub-regional context; the Mondragon Cooperative Group (MCG) in the Basque Country, Spain, which represents a distinctive RIS (Cooke, 2008:404). The Basque Country is also a region in which SC is traditionally recognized as a key asset for economic development (Aragon et al., 2014) and the MCG is a well established economic and social rich ecosystem set up in the Basque Country with a wide range of

economic activities and structures that are ideal to critically discuss the selected questions.

In the next section, a discussion on RIS efficiency is developed, followed by an argument in the third section for the importance of CSC for regional development and innovation. The fourth section examines the value of “institutionalizing” CSC to promote RIS effectiveness and efficiency. The fifth and sixth sections focus on the methodology and the empirical evidence presented through selected case studies, while the final section discusses the findings and new contributions of the paper.

2. Gaps and inefficiencies in regional innovation systems

Large firms have traditionally relied on their internal capabilities and formal research collaborations as means to develop innovations. SMEs might also be innovators (Maula et al., 2006). There are high-tech SMEs and start-up firms radically innovative that occupy market niches that are not profitable for large firms and they can better adapt to customer needs (KFW, 2015). But the majority are innovators in a different form. Their capacity to be flexible and to customize products can lead to innovation, although their capacity to innovate is often restricted by their limited resources (e.g., a lack of financial and specialized human resources) (Nieto & Santamaria, 2010). Therefore, SMEs focus on small-scale innovation initiatives that are linked to specific products or services

instead of the development of broader strategic innovation portfolios. Their difficulties in developing wide-ranging innovations encourage innovative SMEs to collaborate with others (Edwards et al., 2005) and promote the growth of innovation systems, taken as a pool of organizations and firms focused on innovation exploration and exploitation, and interacting with one another and with policy agents in a common learning environment (Cooke, 2001). While the first innovation system conceptualizations and applications were made at the national level, the regional level is now seen as a more appropriate framework for interpreting and promoting innovation dynamics that can help local and regional production systems (e.g. clusters) become more competitive in open markets (Cooke, 2001; Asheim and Gertler, 2005; Hollanders et al., 2009; Asheim et al., 2011).

Within the RIS conceptual framework, one of the key issues of academic and policy debate is these systems' capacity to effectively and efficiently promote the innovation efforts of firms, particularly SMEs. There is wide recognition that the mere existence of policies and organizations centred on innovation does not automatically guarantee efficiency and effectiveness (Nauwelaers et al., 1999; Tödting and Trippel, 2005; Parrilli et al., 2010; Rodríguez-Pose, 2013).

Some studies have examined the conditions under which these innovation systems deliver to businesses the expected inputs that will later be converted into valuable innovation outputs (Edquist, 2005; Tödting and Trippel, 2005; Rodríguez-Pose and Crescenzi, 2008; Hollanders et al., 2009; Nauwelaers, 2011; Alberdi et al., 2014).

Business systems, however, can be innovative and competitive despite limited collaboration with innovation organizations is in place, just as significant investments in R&D and human capital can also have limited effects on innovation output (i.e. the “innovation paradox”, see Edquist, 2005). Within this debate, several authors have studied whether and how innovation systems work efficiently and effectively. Some of them have insisted on the role of regional-level connections among different economic and policy agents (Nauwelaers et al., 1999; Rodríguez-Pose and Crescenzi, 2008; Alberdi et al., 2014; Tripl et al., 2016), while others have stressed the peculiar industrial specializations and institutional fabric of the regions that led to specific RIS pathways (Hollanders et al., 2009; Isaksen and Tripl, 2016).

We follow up on the works of Burt (1992), Murphy and Edwards (2003), Nauwelaers (2011), Alberdi et al. (2014), and Tripl et al. (2016), which identify a set of system gaps as being responsible for the multiple weaknesses (*gaps*) that prevent innovation systems from effectively and efficiently promoting business innovation. These are so-called managerial gaps, structural holes, innovation gaps, and valleys of death. Recognized RISs can present strengths in some of these areas but also weaknesses in others; the identification of such gaps helps policy-makers to target specific actions oriented to enhance the effectiveness of the RIS as a whole (Alberdi et al., 2014).

Managerial gaps refer to a lack of (intra-firm) SME managerial capabilities and knowledge. These are technical, organizational, or commercialization abilities that help

firms undertake innovation projects that increase their overall competitiveness (Burt, 1992; Alberdi et al., 2014). Structural holes refer to a lack of inter-firm cooperation toward innovation. This type of gap is caused by the atomistic work of firms in the market; they neglect the possibility of pooling resources (competences and technologies, or distribution channels along the supply chain) with other firms to produce higher outputs (Nauwelaers, 2011; Alberdi et al., 2014). Innovation gaps emerge when firms and innovation organizations (e.g., universities or technology centres) do not interact or channel relevant knowledge and investments (e.g., projects) toward SMEs so as to lead to effective innovation (Parrilli et al., 2010; Nauwelaers, 2011). Valleys of death relate to a lack of connection between policy and financial agents (either at the national or regional level) and the businesses sector over the process of new product exploitation (commercialization). This type of gap is crucial in determining the abilities of firms to take innovations (e.g., patents and prototypes) to the market (Murphy and Edwards, 2003; Nauwelaers, 2011).

Our contribution seeks to connect this discussion on the inefficiencies of the RIS with the SC construct. This work intends to demonstrate how SC has a direct impact on specific gaps in RISs. Our crucial argument is that the capacity to address such gaps is the result of a gradual grassroots-led (SC-based) process that progressively activates collaborative mechanisms (i.e., institutions, defined *à la* North, 1990), which lead to a more effective RIS. This represents a relevant academic challenge because the

combined action of SC and regional institutions for innovation and development remains unclear (Barrutia and Echebarria, 2010). In this paper, we provide an account of the dynamic synergy between the two to bolster regional innovation and economic development.

3. The role of social capital in fostering innovation

Following Fukuyama (1995), SC is a pool of values, norms, routines, and interpretations that are shared across society, help people live better (i.e., welfare), and help the workforce and organizations work better, more cooperatively, and more efficiently.

Nahapiet and Ghoshal (1998) identify the relational, structural, and cognitive dimensions of SC that represent different levels in which SC influences economic activities. The “relational dimension” implies the existence of a set of interactive values (e.g., trust, reciprocity, and commitment) that provides a remarkably efficient facilitator for economic exchange and cooperation (Cooke et al., 2004; Aragon et al., 2014). The “structural dimension” refers to the overall pattern of connections between actors, measured in terms of “breadth” and “depth” (Uzzi, 1996). The “cognitive dimension” represents the beliefs shared among local agents, which help them identify common needs, goals, and agendas as well as develop effective collective innovation processes

(Putnam, 1993). This range of critical aspects makes of SC a multidimensional concept (Woolcock and Narayan, 2000; Dasgupta, 2003; Beugelsdijk and Van Schaik, 2005).

Several scholars acknowledge the role of SC to promote collective learning processes to help enhance the innovativeness and competitiveness of firms and regions. For instance, Anderson and Jack (2002) describe SC as a bridge-building process for effective exchanges, and Asheim et al. (2007) argue that SC (along with other factors) is a key element of collective learning. Aragon et al. (2014) argue that SC increases the efficiency of action (Nahapiet and Ghoshal, 1998) and information diffusion (Burt, 1992), reduces the costs of monitoring processes and transactions, and encourages the cooperative behaviour necessary for innovation and value creation (Fukuyama, 1995).

Tura and Harmaakorpi (2005: 1119) state that “SC is a critical resource for RISs since it gives a network the capacity to utilize the material, economic and intellectual resources of the whole collectivity, as well as social resources located outside”. This interpretation stresses the criticality of two perspectives of SC: bonding and bridging SC (Putnam, 2000; Woolcock, 2004). Both perspectives are suitable tools for describing the different types of SC needed in RISs.

The shared local social norms and cooperative spirit provide social safety nets to individuals and groups. These assets explain why societies tend to maintain traditional forms of SC through family, kinship and community. When the state is unable to

provide basic services, SC based on family and kinship relations provides a cushion against hard times. However, bonding can also have negative effects, e.g. groups based on ethnic or political objectives that promote practices of exclusion based on intolerance, distrust or hate, or cultivate nepotism in the interest of a family or a group (Fukuyama, 2002). Putnam's concept of bridging in SC refers to social networks between heterogeneous groups. Bridging allows heterogeneous groups to share and exchange information, ideas and innovation, and builds consensus among groups that represent diverse interests. This widens SC by extending the 'radius of trust' in Fukuyama's terms. In synthesis, bonding SC connects the members of homogeneous groups (i.e., strong ties) (Granovetter, 1985; Putnam, 2000, Woodhouse, 2006), whereas bridging SC creates bonds of connectedness across diverse groups (i.e., weak ties *à la* Granovetter, 1985). As a result, individuals may gain access to skills and resources currently not available within the local system, and push the group towards new economic opportunities (Woodhouse, 2006). Emerging studies explore the relationship between the form of SC available in a region and innovation performance with bridging forms of SC found to be the most significant (Crescenzi et al., 2013). Additionally, Tura and Harmaakorpi (2005) argue that if there is only bonding SC in the network, this may lead to unwanted results due to a decrease in absorptive capacity. Bonding SC alone can lead to a closure of the network and potential collective blindness.

These two types of SC have a relevant role in RIS innovation dynamics and in the aforementioned RIS gaps. Bonding SC acts as a super-glue among close agents; for instance, SMEs located in the same region hold similar culture and values, which favor inter-firm collaboration (gap 2). However, exclusive bonding SC creates more inward-looking networks that hinder the opening of further networks while enhancing over-embeddedness (Uzzi, 1997). Bridging SC reduces the perceived distance in terms of procedures, language, and aims and connects better (heterogeneous) agents. In general terms, bridging SC lubricates cooperation with heterogeneous agents, enhancing creativity and innovation within the system.

Pihkala et al. (2007) consider that the SC required for regional development is best described as “creative SC” (CSC). CSC is the form of SC that generates creative tension (Sotarauta and Lakso, 2000) and a balanced amalgam between bridging and bonding SC (Putnam, 2000), thus supporting the necessary socio-institutional change that remains at the basis of an effective and efficient RIS. In fact, CSC promotes different types of regional innovation-oriented collaborations rooted in the three SC dimensions (cognitive, structural, and relational) and simultaneously implies the maintenance of a balance between bonding and bridging SC that maintains the “weak ties” effect so necessary to foster creativity and innovation, and to promote regional innovation dynamics.

This paper explores the CSC effects on RISs, particularly in addressing the aforementioned eventual RIS gaps. As a consequence, the first research question we address is the following; can CSC help to close the identified RIS gaps?

4. The institutionalization of creative social capital as a driver of regional innovation system's efficiency and effectiveness

SC does not emerge automatically from interactions. Trust and credibility take time to form (Mackinnon et al., 2004). Other conditions are also needed. Following Dasgupta (2003), the maintenance of trust is achieved by the “mutual enforcement of agreements”, which is based upon the reinforcing the (cognitive, relational, and structural) dimensions of SC insofar as the equilibrium between bonding and bridging SC. This effort helps to preserve the virtuous dynamic of SC as a means to foster regional innovation processes

In this sense, some academics have related SC with the institutional perspective. In his sociological perspective, Bourdieu (1986) considers SC as the sum of the resources generated by the possession of a durable network of institutionalized relationships. In this same vein, formal and informal networks between people in a common location and the resulting evolution of local institutions form part of the SC surrounding innovation processes (Malmberg et al., 1996). Lorentzen (2007) also defines SC as social relations

among agents combined with social institutions that enhance cooperation and communication. In this sense, following Kallio et al. (2010), creative SC is argued to be more a capability-like resource than an asset.

Echoing this line of thought, we move a step beyond and argue that the institutionalization of CSC is a critical catalyst of RIS dynamics. This institutionalization process of CSC focuses on the bottom-up endeavour of the local population oriented to cooperate and form collective institutions and organizations that serve their economic and social purposes (e.g., the creation of cooperatives, local training centres, or financial institutions). This meso-level (regional) approach can mesh with a meta-level, which includes culture, norms, values, and relations (Hollingsworth, 2000; Rodríguez-Pose, 2013) and is particularly important and representative of locally based SC.

The institutionalization literature emphasizes that institutions are socially constructed templates for action that are generated and maintained through ongoing interactions. Following Barley and Tolbert (1997: 96) the definition of an institution is “shared rules and typifications that identify categories of social actors and their appropriate activities or relationships.”. Institutionalization is a process that occurs through social interaction over time. When people interact, certain patterns emerge in their actions; these represent common knowledge bases, which become gradually collective and explicit. This common knowledge further enhances shared typifications of actions, experiences and

actors. Any such typification comprising both actors and actions may be termed an institution (Ladegaard and Syvertsen, 2005).

Following the same authors and according to the institutionalization logic, what the SC of a group or organization looks like after the institutionalization will be a function of both the constraints imposed by the existing structures/institutions and the actions taken by the organization to reproduce and/or reconfigure those structures. For example, a cluster association can represent the institutionalization of bonding and bridging among different companies and agents that share values and goals, and work in networks. In this sense the institutionalization process can be a consequence of pursuing the desired balance between bonding and bridging SC. Through this process, collective action dynamics within and beyond one's own group ignite CSC.

This is a continuous process (Giddens, 1984; Barley and Tolbert, 1997) whose development can be observed through time. Instead of focusing on usual intermediary institutions (Iturrioz et al., 2015) or industry associations (Watkins et al., 2015), the “collective action model” (Hargrave and Van de Ven, 2006) is adopted here as it examines the construction of new institutions through the behaviour of network members that emerges around an innovation. According to Di Maggio and Powell's contribution (1983) on the “structuration” of institutions, we argue that CSC requires an “institutionalization” process, divided in stages, that helps to overcome the RIS gaps.

Echoing Di Maggio and Powell (1983), the first two stages involve the shared awareness of the gap as a common problem and the will to face this gap in a collaborative way. Following Hargrave and Van de Ven (2006), we add a third stage, in which the agents are aware of the need to work together to design and implement a collective solution to overcome the gap. Therefore, a certain degree of institutionalization of SC enhances a three-stage process (the collective identification of a gap, a shared interest in collaboratively solving the gap, and the implementation of a collective “institutional” solution) that mobilizes RIS agents in order to reduce the existing gap and to produce a more efficient system. In the long run, the institutionalization of CSC responds to the challenge of maintaining healthy and lively CSC in the context of RISs in order to minimize the RIS gaps. As a consequence, we aim to address the following research question: can the institutionalization of CSC further contribute to close eventual gaps identified in the RIS?

5. Research methodology

Multiple players and dimensions are involved in RIS and the institutionalization of CSC. In order to study this complex phenomenon, a qualitative research approach is appropriate (Yin, 2003), and particularly the case study method. Case studies are especially suitable when complex social phenomena are considered in their real-life

context (Yin, 2003) and for theory building or testing when theory relies on the context (Gioia et al., 2012). In particular, we apply an exploratory case study, which is suitable when the assessed action has no clear, single set of outcomes (Yin, 2003). The case or unit of analysis is a single case, Mondragon Cooperative Group (MCG), with several embedded units (cooperatives, research centres, and corporate units). MCG is a well-established economic and social ecosystem set up in the Basque Country with a wide range of economic activities and structures that are ideal to provide evidence on the selected questions. Moreover, the MCG case reveals new insights that clarify the role of SC in the RIS dynamics, in particular because it is located within one of the most established European RIS (Cooke, 2008; Olazaran et al., 2009).

MCG is the largest cooperative group in Europe, with more than 70,000 workers and approximately 250 autonomous firms and cooperatives, 15 technology centres, and a corporate centre. MCG is “a business model based on inter-company co-operation” (see webpage), which implies that these firms are, in occasions, competitors willing to collaborate. MCG was founded in the early 1950s to develop employment and development opportunities for the local community in the Basque Country. This initiative met the dynamic and participatory response of the local population, which took over this effort by recognizing themselves as part of a community that shared a common culture, language, traditions, and manufacturing skills and capacities; in other words, a shared SC. Over time, MCG proved to be dynamic, participative, and resilient,

thus forming the backbone of the regional economy. Existing and new cooperatives have been eager to become part of this cooperative group and the group has been enlarging since its foundation. Nevertheless, there have been notorious cases of firms exiting the group, mainly big cooperatives that have a strong position in the markets. In 2015, the total income was 12,110 million euros (Mondragon, 2015). The cooperatives and MCG have created several institutions and organizations to offer solutions to a set of production and innovation problems. Due to the numerous independent cooperatives, technology centres, and innovation initiatives of the group based in a specific territory, MCG represents an appropriate unit of analysis for the study of the dynamics of SC and its “institutionalization.”

In order to gather critical information, we analyze eight different units of the MCG: four cooperatives from the industrial division, two R&D technology centres, and two corporate units. Data were collected between December 2012 and July 2014. Semi-structured interviews were held that lasted between 90 and 120 minutes each to eight key informants, CEOs, and top managers. The transcription of the interviews was sent to the interviewees in order to avoid mistakes and misinterpretations. In addition, a range of secondary data sources were used to triangulate and complete the information collection. Different researchers examined the information, thus helping to investigate the case under several different perspectives (Yin, 2003). In this way, consensus was

reached about the application of this research methodology while the essential traits of validity and reliability of the case study are guaranteed (Table 1).

[INSERT TABLE 1]

This specific case offers a wide range of structures, relationships, and initiatives that provide analytical evidence to respond to the two research questions.

6. Empirical evidence

6.1. Lack of inter-firm cooperative relationship for innovation (gap 2)

In order to critically analyse to what extent and how CSC encourages inter-firm cooperative relationships, two different realities have been selected: the Business Acceleration Center (BAC) of MCG and the designers–manufacturers relationships in certain SMEs.

- a. The BAC is a centre that has been created to foster entrepreneurial attitudes within the cooperative system. It answers to the collective need of innovation in products, solutions, market segments, and business organization. A participatory methodology is the way in which different cooperatives exchange ideas and generate innovations. The BAC is a specialized structure whose aim is to launch

new businesses based on trustful interactions among managers, technicians, and firms within MCG.

A top manager of the corporate centre explains:

“The BAC is an ecosystem oriented to launching new businesses related to advanced services. It was promoted by the Corporative Promotion Centre with the aim to boost the entrepreneurial spirit as a means to support the Mondragon transformation strategy... with bottom-up dynamics. With this objective in mind, people of different backgrounds and teams get together to generate new projects. Participation in these dynamics is open, voluntary, and freedom and openness in the exchange of opinions is guaranteed. ... After several sessions 10-12 business ideas are pre-selected, and the cooperatives express their interest in developing these ideas further. If the answer is positive the idea is selected and a promoter gets responsibility to develop it. The basic idea is to work in teams to think about new business opportunities.”

This interview excerpt shows the way MCG develops innovation capabilities and managerial systems that go beyond market mechanisms for the promotion of new entrepreneurial initiatives that benefit the territory as a whole. In these BAC sessions, bridging SC creates bonds of connectedness formed across diverse persons, teams and firms (Kallio et al., 2010), and the participants explore the possibility for joint action

(Tura and Harmaakorpi, 2005); in this particular case, the possibility to develop a new business. On the one hand, the BAC tries to develop a creative tension among participants (Sotarauta and Lakso, 2000) and, on the other, promotes a balance between trust and emotional connection (bonding), and explores new ideas from heterogeneous agents (bridging) that can turn into new businesses. Therefore, CSC is at work in this initiative. This voluntary initiative that involves the participants in interactions beyond their daily duties is an example of how the gap 2 can be solved through CSC by means of an institutionalized approach (i.e., the BAC) that can spur innovations in the local enterprise system. The institutionalization of the BAC, the management of the creative tension, and the unstable equilibrium of bonding and bridging helps to maintain cooperative relationships for innovation among SMEs, thus closing gap 2. In this case, the role of the BAC leader is critical to overcome suspicion (that could appear in some cooperatives) of sharing information and ideas with others. The mediator role is critical in deactivating negative SC and in creating an appropriate climate for the fertilization of new ideas in this regional ecosystem.

- b. SME II is a cooperative that offers a modern product design that stands out for its versatility, comfort, and the functionality of its components for the furniture sector. They produce an innovative and personalized design that is industrialized on the basis of the strictest quality control. For this purpose, the firm collaborates with prestigious designers who work for several other firms and

projects. The specialized contribution of these designers is critical to SME II as they help to build a very unique product. The CEO explains the importance of having a balance between “sticks and carrots” to enable trust between the firm and the designers, as well as to push the designers to give their best. The objective is that designers improve their previous work and competence, and share their knowledge with the cooperative (but not with other clients).

“Our relationship with designers is very important. Our designers are crucial collaborators. We maintain stable relationships and they value that we are a cooperative because they think that we are more stable. They are very trustful partners for our-long term confidential relationship. They also work with other firms. From their know-how we have to extract the maximum and introduce differences that others cannot imitate. It is an interdependent triangle between design-management-engineering. They see us suspicious, and we want them to see us like this (because it puts pressure on them). We give them important market opportunities, as their design can reach quickly everyone, even internationally. And we offer them a good industrialization of design. All in all, to be a cooperative firm has helped in building up this relationship.”

There seems to be a contradiction between developing mutual trust and commitment with the designers and the suspicion that the CEO raises. He manages the balance by giving the designers trust and freedom to create and innovate while conveying to them

that he is aware they can also do their best for the competitors. The firm offers the designers long-term relationships, capacity to industrialize their creation, stability in their collaboration, and market access. However, it also wants them to work out of their comfort zone, giving their best effort not only in the design creation but also in gathering information from the market. In this case, having too much bonding with the designers means they will not create the best ideas and the firm will not receive the best designs from them. In this example, the CEO plays a key mediator role (Kallio et al., 2010) to balance the needs of the firm and the designers. CSC is present through the balance of bonding and bridging SC and the creative tension that the designers experience to produce their best designs. This process helps close gap 2.

6.2. Lack of relationships between RIS agents and SMEs (gap 3)

SMEs realize the cost of participating in innovation networks. For this reason, MCG has developed its own technology centres (15), which have a strong relationship with MCG cooperatives. One of these technology centres was created 12 years ago. This centre has six partner cooperatives that are also stakeholders. It is a service cooperative whose members are its 30 employees and the six cooperatives. This centre develops projects aimed at guaranteeing the commercial impact of R&D efforts. The CEO explains the

importance of trust and sharing knowledge to produce a win-win situation across the cooperatives:

“The first motive to create the centre is to reach a critical mass to be able to supply several cooperatives with technology intelligence, maintenance services, among others. Trust is essential when projects with different cooperatives are developed. ... The presence of trust favours innovation because the effective management of knowledge is being pursued. Synergies are reached in an informal way. In the centre, there are employees, engineers and researchers who are highly specialized in particular fields and who transfer their knowledge and competences across the network. All members benefit from such knowledge and experience in an atmosphere of open exchange.”

In this way, the technology centre becomes a key agent for filling the “technology gap” between RIS agents and SMEs.

The CEO described a particular project in the health sector as follows:

“We produce ‘low-profile’ innovations (short-term, incremental), but if we did not, the cooperatives wouldn’t produce anything new by themselves. They would have done what the client asks. They are reactive. We want to push the cooperatives forward. Their new products are developed with our specialized centre. For example, the project that we have launched in the health sector

between three cooperatives and our centre has been a great (organizational) innovation. One member brought the idea from a trade fair in the USA. It was about the automation system for the assembly division of the health sector. This required long-term investment in personnel and infrastructure. A new business was created, which employs 14 people today. The owners are the three cooperatives. The project was started five years ago, the prototype was sold in its fourth year, and production expansion has now started. We have invested approximately 3 million euros and we have an offer for 25 million euros. Some of the cooperatives do not develop machinery, but they have invested resources. If the activity succeeds, it generates new employment opportunities and more business. It is a strategic approach to diversification, and a win-win situation for all, although it is not frequent.'

In this piece of evidence, the importance of CSC is underlined by one of the cooperative participants (SME IV) and the CEO of the centre involved in the project. The pre-existing relationship of trust among the cooperatives (bonding SC) has been essential for developing new business initiatives in a high-potential sector. Sharing common values (such as the aim of creating new jobs) and an approach to diversification with a long-term perspective have also been key elements that keep faith in the project and the people involved. The existence of bonding SC in the form of trust, shared values, and visions and the previous connections among the cooperatives represented necessary

conditions for undertaking complex innovation projects (e.g., the health project). In this way, the cooperatives find it easier to take a long-term approach to innovation and thereby become more capable of postponing the benefits of complex and long-term projects. Having previous emotional connections and trust among the cooperatives has been a necessary condition to explore new projects in a new sector in which a number of heterogeneous agents have been involved. This innovation centre and the participants have balanced bonding and bridging SC and have been able to face the necessary change to manage and start up a new successful business. This can be considered CSC insofar as an example of its institutionalization, which has passed through three stages: the collective identification of a challenge, the wish to address it collectively, and the definitive implementation of a joint solution.

Sometimes negative emotions and distrust appear. In such situations, the mediator role of the leader to counterbalance distrust is required, though not always achieved. The six cooperative firms do not always enter the projects with the same spirit; sometimes they are less open to interact. In this case, CSC might not help to close the gap between SMEs and RIS agents.

In some cases, too much institutionalization could be a limitation for innovating attitudes. As the CEO of the technology centre described:

“Sometimes there is jealousy among the participants and some lack of trust when sharing the outcomes of particular projects. Therefore, we decided to write a protocol about how to talk with total openness on new projects. But in order to access a project’s written document a formal permission was necessary. Six months ago a project’s report was requested but there has been some delay with the permission due to some mistrust.”

As we see in the previous evidence, a certain degree of institutionalization in the collaborative relationships between RIS agents and enterprises ensures safe and cautious use of strategic information shared in innovation processes. However, excess institutionalization of the procedures of project sharing could result in slow processes and in increased difficulties to spread the results across third parties. So, when the institutionalization of CSC happens, the process of closing RIS innovation gaps is maintained in the long-run and spread across a wider number of regional agents.

6.3. Public policies’ lack of support for SME exploitation of technological innovations (gap 4)

The “valley of death” gap refers to the period of time after a product innovation begins generating revenues and to the high probability that an innovative firm disappears before a steady stream of revenues is established.

In the words of a top manager of the corporate centre:

“Innovation is developed at different levels inside the group whilst the contribution of external firms, centres, and universities is also relevant. In the potential valley of death, SC helps to align the different interests and paces of a whole range of actors (e.g., centres, cooperatives, and universities), thereby helping innovations to survive until they are at least launched to the market. To overcome the risk of the valley of death, MCG organizes different sources of finance. The financial division of Caja Laboral (a MCG financial institution) was created in the Deba Valley to solve the difficult access of cooperatives to finance. Currently, this financial cooperative offers financing not only to the cooperatives of the group but also to other firms and the public in general. Each MCG division has its own budget to invest in innovations. This is an additional source that can solve the important problems of financing and liquidity, which come up when launching new business projects to the market. Complementarily, MCG has developed different tools (e.g., research centres, financing programs) to help individual cooperatives take their innovations to the market.”

In the words of a top manager of Caja Laboral:

“Mondragon was an accumulation of cooperatives until 1991. Due to the restrictions that these SMEs faced in the financial markets, in 1959 a group of

cooperatives within MCG created Caja Laboral as a financial intermediary based on the cooperative model. Each group of people who wanted to create a cooperative business knocked on the door of Caja Laboral and entered Mondragon (MCG).”

Caja Laboral was launched by MCG through the initiative of a group of several cooperatives with the purpose of becoming a local and territorial solution to the financing of many cooperatives. There were other financial institutions, but they did not respond to the needs of the cooperatives; thus, they were not a real solution. In this case, public policies did not have a direct impact on SMEs; it was MCG that created an institution (i.e., Caja Laboral) to fill this gap. The failure of public policies to fill the valley of death in the RIS was tackled by the bottom-up creation of local social networks, which led to the creation of a new organization (i.e., institutionalization) capable of addressing this critical gap. CSC appeared in this case through the creative collaboration among local economic agents within the MCG group and the local government that helped to create Caja Laboral. Gap 4 (the valley of death) is solved by the process that gives an answer to a common (financial) problem identified by many cooperatives in the region.

In this case there is also evidence of a collective identification of a need (finance), the search for a joint solution, and the implementation of an institutional mechanism: Caja

Laboral. It shows how MCG has overcome the valley of death through the institutionalization of CSC.

To summarize, Table 2 shows the mechanisms identified in the context of MCG in the Basque Country, a region that is associated with strong homogeneous networks of people and businesses.

[INSERT TABLE 2]

7. Discussion and conclusions

Three main findings are underlined in this study thanks to the privileged environment provided by MCG to critically analyze the selected research questions. Concerning the first research question about the role of CSC to close RIS gaps, we agree with Crescenzi et al. (2013) when they state that SC is a precondition and an essential context-based factor that impacts either directly or indirectly (mediating the effects of other business variables) on regional development (see also Putnam, 1993; Becattini et al., 2009; Parrilli, 2009). However, this high SC-based context is not enough to guarantee significant innovation output. Even in this context, innovation can be hampered by socio-institutional inertia (Pihkala et al., 2007). For instance, regarding gap 4, there were financial institutions before the creation of Caja Laboral, but they did not respond

to the specific requirements of the cooperatives. Similarly in gap 2, excessive bonding among BAC members did not let them share their innovations with new members.

In order to address the types of gaps in the RIS, innovation has to be stimulated by creative tensions (CSC) and shared across a network where external/heterogeneous and local/homogeneous agents can both access and be accessible in a balanced combination of bonding and bridging SC. In this case, as Kallio et al. (2010) argue, CSC is more a capability-like resource (than an asset), which is well articulated so as to close RIS gaps. This dynamic is illustrated by the cooperative technology centre that encourages CSC (e.g., where an opportunity is hosted, nurtured, and supported, as in the case of the health sector project). These findings are also consistent with the way effective RISs work. CSC is a catalyst of knowledge-based collaborative interactions across the different types of regional agents (e.g., firms, service organizations, and policy-makers) that target the production of new sets of products, processes, and services (Cooke, 2001) or, in a more structural type of upgrading, includes the development of completely new industrial pathways (Asheim et al., 2011; Isaksen and Trippl, 2016). Overall, RISs are more than just a collection of different stakeholders and agents with high knowledge endowment. In our view, and answering the first research question, they represent a “collective and organic intelligence” that divides, specializes and coordinates the regional (innovation) labor for the development of the regional economy. In this context, CSC operates as an essential driver of such capacity that is oriented to trigger

effective and efficient interactions among innovation agents. However, CSC is not a panacea. As shown, the BAC promotes collaborative practices to induce trust among their members; yet the existing limited trust curbed the sharing of strategic information among firms (gap 2).

Related to the second research question about the conditions for institutionalization to contribute to close RIS related gaps, three aspects have been observed: preconditions, process and level of institutionalization. First, when the firms faced a gap, the local community developed collective “institutionalized” solutions (i.e., the creation of formal organizations, mechanisms, or initiatives) as a means to restore adequate levels of dynamism and performance across local SMEs, thus helping to close the gap. In these situations, SC is a precondition for institutionalization. Indeed, shared values, rules and behaviors promoted by MCG are at the basis of institutionalization. However, an excessive level of institutionalization can hinder the SC, e.g. when some firms that were forced to accept a set of MCG rules, preferred exiting the group.

Second, regarding the process of institutionalization of CSC, in our case study three stages can be observed in all the actions developed by MCG. First, there was the collective identification of the type of gap and the collective and voluntary problem-solving process was activated. Second, a collective solution has been explored through meetings, exchanges of ideas, and experimentation. Third, CSC takes a more robust form, that is, specific institutions (i.e., mechanisms, rules and organizations) are

activated bottom-up by local agents in search of effective solutions to significant gaps/problems. SC has such an effect once it passes through the stages of collective awareness, interaction, and problem-solving actions that—as already discussed in the context of a trans-local business network (Hargrave and van de Ven, 2006)—may be ordered in a type of relevant sequence that helps to build the necessary capabilities within the local/regional economic community. This approach does not focus on specific agents or intermediaries (Nauwelaers, 2011; Iturrioz et al., 2015; Watkins et al., 2015); instead, it is centred on the institutionalization of CSC. However, too much institutionalization (i.e., too rigid norms, mechanisms, and solutions) could become a barrier for innovation as it could hinder individual initiatives and proposals. A good balance between the institutionalization of CSC and some degree of flexibility around the institutional solutions could produce a more effective approach to innovation.

Third, in the cases it can be observed that the investment involved in the solution (to the gap) is associated with the required level of institutionalization. It has been found that the higher the investment required, the greater the level of institutionalization required. In fact, without CSC-based institutions, only “low-profile” innovations were developed by the members of the local network (as had been recognized by the manager of the technology centre in gap 3). Thanks to the CSC developed by the institutional solutions (e.g., the health centre) to close a specific gap (gap 3), high investment-demanding innovations were developed. In contrast, when investment levels were limited, such as

in the case of the furniture producers and designers, more shallow institutionalization processes were necessary (e.g., gap 2). This whole discussion leads us a step further in the analysis of the role of institutions for regional development (Rodríguez-Pose, 2013) and, particularly, for regional innovation processes (Tödtling and Trippel, 2005; Isaksen and Trippel, 2016). This step ahead captures the process of institutionalization of CSC in particular contexts and implies the consideration of CSC as a driver in the process of promoting local capacity building while allowing a constant adaptation of networks collaboration networks and their development strategies. Moreover, in the specific literature of innovation systems, this analysis also helps to go beyond depicting and appraising the gaps that exist among agents of the RIS (Rodríguez-Pose and Crescenzi, 2008; Hollanders et al., 2009; Nauwelaers, 2011; Alberdi et al., 2014; Trippel et al., 2016); as a matter of fact, this work assists in characterizing a context-specific driver (CSC) and its institutionalization as an effective means to close such gaps.

Finally, even if this conclusion has to be verified (considering new perspectives, such as the workers' or the external stakeholders' view), these cases show the relevance of the leader role as long-term CSC promoter. This result is coherent with Hauschildt and Kirchmann (2001). When negative emotions and distrust appear, leaders mediate among the agents in order to create the required atmosphere to cooperate, even if the involvement of all the agents in the innovation process is not always reached (this situation is illustrated in both gaps 2 and 3). Besides, they activate CSC and generate a

virtuous spiral dynamic that nurtures innovation. They foster innovation, generating new bonding and bridging connectors to bind and share information and capabilities among different groups of agents in the network over time (Iturrioz et al., 2015). This aspect can be further explored in future studies on the essential roles needed within RISs to make CSC work effectively, in particular requiring additional information sources from others than leaders.

In practical terms, this contribution has two main implications. At the regional level, innovation policies for SMEs are more likely to be successful when CSC bases are taken into account. In this context, a participatory process that integrates not only participative design and reflection with stakeholders (Aragon et al., 2014), but also the explicit consideration of the benefits of CSC, which motivate and orient the action of the RIS members has to be promoted. In this sense, a top-down pedagogical process has to be assumed by policy-makers.. This is consistent with previous studies indicating that blanket interventions are ineffective as they neglect local/regional specificities (Tödting and Tripl, 2005; Asheim et al., 2011; Rodríguez-Pose, 2013). At the micro level, this approach supports the development of adequate management capabilities for the activation of action processes in the RIS. As Iturrioz et al. (2014, p. 113) state “the people that are orchestrating and facilitating these innovation initiatives [...] transmit the strategic relevance of the project. They promote the shared dynamics and create the appropriate context to develop new innovation initiatives”. Promoting complementary,

positive, and balanced relationships among agents and building spaces to provoke creative tension are two of the main responsibilities of SMEs leader to promote innovation. Advanced education in business management is a crucial means to enhance these abilities and techniques needed to develop effective RISs.

The main limitation of our study is its specificity, an issue that could be addressed by employing this conceptual framework in new case studies. Repeating this analysis will provide insightful data for a historic analysis of the relationship between CSC and regional innovation processes. Besides, the reliability of the study could be strengthened with complementary interviews of workers and other stakeholders in order to avoid the potential bias due to employing a unique perspective. In this sense, the relevance of leader as CSC promoter should be verified with this additional source of information. Finally, other recent experiences, such as network-based innovation brokering (Svare and Gausdal, 2015), can be considered to enrich this model.

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