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Cooperation between firms and regional development: a review

La cooperación entre firmas en el desarrollo regional: una revisión

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Abstract

The study of cooperation between firms within the field of economic development has a longstanding tradition, particularly in regional development. This research aims to carry out a review of the literature concerned with the role that firm cooperation has in the regional development. The review includes works that analyze empirical cases and aim to identify the elements that explain why in some cases inter-firm cooperation is successful while in others it is not. The dimensions of cooperation emphasized in the surveyed works share various similarities: the conditions in regional agglomerations that enable repeated interactions between firms to take place, the need for governance mechanisms to enforce cooperation between firms and to prevent opportunistic behavior from arising, the institutionalization of cooperation, the impact external factors have on the continuation of cooperation between firms. An emphasis in the literature on learning, knowledge-diffusion and innovation processes were identified. In the concluding remarks, the role of cooperation between firms in the regional development literature was summarized in four main dimensions: 1) the industrial organization of industrial districts, clusters and regions; 2) the balance between cooperation and competition; 3) governance mechanisms and the building of trust and reciprocity in firm relations; and 4) the impact of external factors on inter-firm cooperation, rendering these relation dynamic.

Resumen

El estudio de la cooperación entre empresas dentro del campo del desarrollo económico tiene una amplia trayectoria en el área del desarrollo regional. El presente trabajo realiza una revisión de literatura sobre el papel de la cooperación entre firmas dentro de las experiencias de desarrollo regional. Se incluyeron trabajos que, mediante la revisión de casos empíricos, identificaban los factores que explican por qué en algunos casos emergen relaciones de cooperación entre firmas mientras que, en otros, no. Se encontraron varias similitudes en las dimensiones estudiadas: las condiciones que ofrecen las aglomeraciones para la interacción repetida entre las firmas, la necesidad de mecanismos de gobernanza para evitar comportamientos oportunistas, la institucionalización de la cooperación, el efecto de factores externos a la región sobre la continuidad de los procesos de cooperación. También se identificó un énfasis en los procesos de aprendizaje, diseminación de conocimiento e innovación que ocurren en las configuraciones industriales observadas usualmente en los clústeres, distritos industriales o región. Se resume el papel de la cooperación en el desarrollo regional en cuatro dimensiones principales: 1) la organización industrial de los distritos industriales, clústeres y regiones; 2) el equilibrio entre procesos de cooperación y competencia; 3) la gobernanza y la construcción de relaciones de confianza y reciprocidad; y 4) el efecto de factores externos sobre la cooperación entre firmas, otorgando a estas relaciones un carácter dinámico.

Keywords | palabras clave

Interfirm cooperation, regional development, industrial districts, clusters, industrial organization.
Cooperación entre firmas, desarrollo regional, distritos industriales, clústeres, organización industrial.

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1. Introduction

Cooperation has been studied in the field of development economics in the topics of regional development and geographical economy, such as the case of the success of some specific regional development, in which production processes were observed in SME networks with interaction through cooperation and competition arrangements, achieving a high global competitiveness. Among the cases that received the most international attention are the Third Italy, Germany and other European industrial districts, and also the case of Japan whose industrial organization, unlike other industrialized countries, is characterized by a large percentage of small and medium-sized firms (Sayer, 1989; Carlsson, 1989). Studies were developed on industrial districts, the "district effect" and clusters as a way to promote regional and national economic development. Several lines of research can be identified (external economies and collective efficiency in industrial districts, small-scale industrialization, innovation in productive networks or clusters, relationships in industrial districts, industrial industries, just to mention a few). Due to the number of perspectives that address the issue of cooperation, relationships between firms, industrial districts and economic development, it can be inferred that to investigate the link between cooperation within the field of the development economy requires delimiting the approach, accepting that there will be edges that will be left out, while others will be given greater emphasis.

Both the lines of research shown above and the context in which this relationship between cooperation and regional development arises, indicate that there is an important link between cooperation between firms and their scale, i.e., the study of cooperation between small-scale firms or cooperation between large firms and small firms, the latter always present in the equation, is privileged in this review. Another link between the study of cooperation between firms and development can be outlined from this observation, specifically a type of development whose benefits are more equitably distributed. The study of the processes in which SME productive groups or networks manage to cooperate to achieve international competitiveness and enact regional development processes is important for the formulation of public strategies and policies that promote a development at the regional and national levels.

Thus, the aim of this research is to conduct a literature review of the role of cooperation between firms within regional development experiences. On the one hand, it seeks to address the revision from a theoretical point of view, selecting works that refer to the conceptualization of cooperation between firms and try to explain the conditions under which it is successful. On the other hand, it seeks to review studies that present specific cases. The following summarizes the findings in the academic discussion on this topic, the discussions and consensuses found.

2. Metodología: criterios de selección

Para la selección de los trabajos parte de esta revisión de literatura se utilizaron las herramientas Scopus y Google Scholar, empleando los siguientes términos en la búsqueda: "cooperation in economic development", "firm cooperation in economic development", "Cooperation in development economics", "interfirm cooperation development". En la selección de trabajos se priorizaron aquellos que abordaban

conceptualmente el estudio de la cooperación entre firmas, así como experiencias específicas de desarrollo regional. Algunos trabajos se seleccionaron de entre aquellos referenciados por la selección inicial cuando éstos parecían ser bastante relevantes al enfoque delineado en el presente trabajo para abordar el vínculo entre cooperación y desarrollo. Este fue el caso, en particular, en la búsqueda de abordajes teóricos de la cooperación entre firmas.

2.1. Methodology: selection criteria

Part of this literature review used the Scopus and Google Scholar tools, using the following terms in the search: "cooperation in economic development", "firm cooperation in economic development", "Cooperation in development economics", "inter-firm cooperation development". In the selection of works, those that conceptually addressed the study of cooperation between firms, as well as specific experiences of regional development, were prioritized. Some studies were selected from among those referenced by the initial selection when these seemed to be quite relevant to the approach outlined in this paper to address the link between cooperation and development. This was the case in the search for theoretical approaches to cooperation between firms.

3. Results and discussion

Cooperation between firms has been addressed in various works in the literature of industrial districts, clusters and regional development. In this review, the types of cooperation identified in the relationships between signatures are introduced, while summarizing the theoretical conceptualizations of each author, identifying similarities and differences.

3.1. Cooperation between firms in economic development literature

Cooperation between firms in the field of economic development becomes particularly relevant from the experience of industrial districts in Third Italy and subsequently, the identification of industrial districts in other parts of Europe and the world (Rabelloti, 1997; Schmitz, 1995; Amin, 1994). At the same time, from the post-fordism studies arise several approaches that identify a change in the way industrial production is organized in the main industrialized economies (Piore & Sabel, 1984; Acs & Audretsch, 1990). In a context of technological change, there was a perceived distancing from a hierarchical industrial organization, from vertical integration, standardized and massed production (called Ford production) to a more industrial decentralized organization on smaller, flexible and heteroarchical scales (Piore & Sabel, 1984; Cooke, 1998). There are a lot of works on this transformation from different theoretical currents and there are still some discussions on this subject (see Amin, 1994).

In general, this emerging form of industrial organization is characterized by the formation of productive networks of small and medium-sized firms, or alternatively, large firms that begin to outsource several of their activities to SMEs to focus on their nuclear competences (Loveman & Sengenberger, 1991) with which they establish more cooperative relationships in order to respond to fluctuating demand for differentiated products and more segmented markets (Sabel, 1994). However,

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relevant to this review is the conclusion that, under this new way of organizing industrial production in a context of deepening globalization, the cooperative and competition relationships between firms are of great importance to build and maintain a competitive advantage (Raco, 1999; Cooke, 1998). Whether in the context of productive networks of companies operating in geographical agglomerations or in a context of large firms that increase the outsourcing of small and medium-sized firms for the execution of some of their activities (Sabel, 1994), in both the need to cooperate to achieve full-value chain coordination becomes imperative, hence it is possible to maintain (or build) competitiveness.

Within regional development literature, there are several works that seek to build a theoretical formulation that explains why in some cases (and under what circumstances) these cooperation processes are successful, and why in others they are not. In the next section, the concepts derived from these theoretical formulations will be introduced. After introducing the concept of external economies, the processes of deliberate cooperation between firms can be divided into: the provision of public goods, the coordination of productive activities and other forms of cooperation.

3.2. Marshall´s external economies

External economies are perhaps the first theoretical formulation that sought to explain the competitiveness acquired by those geographically agglomerated firms that grouped around the same economic activity (Rabellotti, 1997; Schmitz, 1995). The external economies of industrial districts contribute to lower transaction costs between firms. They are side effects of market transactions between firms and are of a public good nature that makes their provision not to be at the optimum level. In other words, because they are positive externalities, the firms that produce them do not do so at the level at which the marginal social cost is equivalent to the marginal social gain of production. It is at this point that cooperation between firms is the element that explains how external economies can be better exploited by providing public goods at optimal levels and avoiding the problem of stowaway (Rabelloti, 1997, pp. 33-36).

3.3. Public goods and collective efficiency

Another advantage that can be found in some cases of productive agglomerations and which is present in most of the revised works is the possibility of cooperating in order to finance certain goods and services that benefit all firms, i.e., the possibility of agreeing to produce public goods. These may include: ease of access to financing, the possibility of buying raw materials together, I+D, marketing, market intelligence services, unemployment insurance, technical training institutes and education for workers, among others (Lorenz, 1992, p. 175, Enright, 1995 in Raco, 1999, p. 953; Rabelloti, 1997; Schmitz, 1995; Porter, 1990, pp. 80-81). Cooperating to produce this type of goods makes it easier for SMEs to access certain services that are usually reserved for large companies due to their cost. Generally, the provision of these services is mediated by an institution created for this purpose, this may be private (a trade union organization, a technical institute co-financed publicly and privately, a bank or cooperative) or public (Rabelloti, 1997, p. 4; Arku, 2014; Goetz, 1993; Gordon, 2007). There is a whole literature that studies these institutions and mechanisms, public or

private, local or national. These works are not part of this literature review, which focuses rather on the mechanisms of cooperation between firms and not on the role that other public or private institutions may play in the process; however, it is important to emphasize that one aspect of cooperation in the relationships between firms is, precisely, as will be presented below, the governance dimension of these processes.

Schmitz (1995) brings together the concept of external economies, the provision of public goods and other forms of cooperation between firms within a single concept, *collective efficiency*, defined as "the competitive advantage that derives from local external economies and collective action" of geographically concentrated firms (Schmitz, 1995, p. 530). Collective action involves the express (and non-secondary) cooperation actions carried out by companies. This cooperation can take several forms, either as collaboration between specific firms (e.g. in innovation or technology adoption projects, coordination between firms and their subcontractors), or through public and private institutions that provide services to all district firms (such as the provision of technical training, market intelligence services, access to financing, among others). Within the latter is cooperation for the provision of public goods, while external economies are an unplanned effect, a side of the interactions between district firms; collective action consists of a conscious collective effort (Schmitz, 1995, p. 536). The author emphasizes the distinction between those passive cooperation processes (external economies) and those that require the proactivity of firms (public goods and other cooperation processes) (Schmitz, 1995, p. 536).

3.4. Other forms of cooperation

There are other cooperation processes that are essential to increase the competitiveness of the district, cluster or region. These processes include, on the one hand, actions aimed at coordinating production throughout the value chain, and on the other hand, adherence to certain agreed competition rules (Lorenz, 1992; Cooke, 1998, p. 22). In the latter, a balance between cooperation and competition occurs, which becomes a necessary process to build and increase the competitive advantage throughout the agglomeration; this point will be delved into the next section. Next, is presented the need to coordinate activities across the chain or value complex.

Because production is organized in a value chain involving several firms, it is necessary that coordination processes be undertaken at each link to ensure that the specifications of the goods produced by each firm are adequate, in order to guarantee quality throughout the chain, to enable a rapid (and flexible) response of production to fluctuations in the final demand, changes in differentiated tastes and finally, to drive innovation processes throughout the chain that would allow to remain competitive. This configuration of localized industrial production of more complex nature is stated by Patchell (1996) as the "regional value complex". It is distinguished from the "regional value chain" in that there are several nuclear firms that outsource several of their processes to other firms, and distribute through several distributors instead of a single nuclear firm that outsources several of its processes and sells its products through several distributors (a value chain) (Patchell, 1996, p. 490). In general, this is the case for several of the identified industrial districts.

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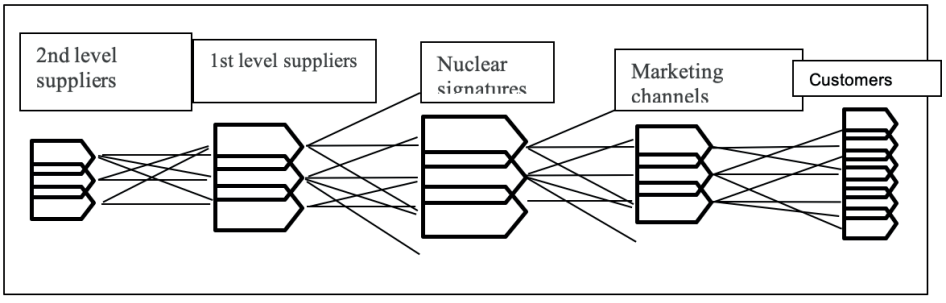
Figure 1. Regional value complex with rivalry between subcontractors, nuclear firms, distributors and buyers



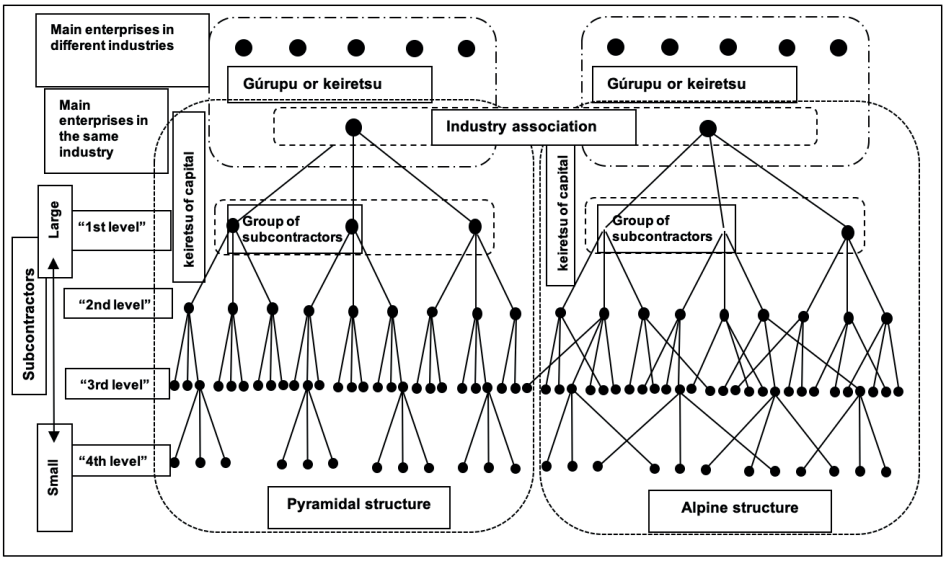
Source: Patchell 1996, p. 490

A similar complex form of industrial organization can be found in Japan's experience, as mentioned by Sayer (1989). As can be seen in Figure 2, the economic activities that make up the value chain are spread across several firms, in a fairly vertical disintegrated arrangement. The case of Japan differs from the other experiences mentioned in the revised work in which there are large firms that are at the top of the organizational pyramid. However, they outsource much of their activities to other firms they establish relationships with, and where cooperation and coordination processes are as essential as in the case of industrial districts and clusters composed of SME networks. There is still a certain hierarchy; however, the need for trusting relationships that enable cooperation and coordination between firms is a requirement for a more flexible production capable of responding to fluctuations in international demand and constant innovation and development (Sayer, 1989). Additionally, the Japanese model, for example in the semiconductor industry, emphasizes the hierarchical nature of the model and nuance the level of cooperation between horizontally competing firms; however, the role of cooperation between firms in the emergence of Japanese competitiveness in this specific industry was recognized globally to the point of promoting research cooperation initiatives in other countries that produce semiconductors (United States and Britain) and whose share of the international market diminished by Japan (Thornberry, 2002, p. 665).

In this context of a movement of the global industrial organization towards vertical disintegration, more flexible production and the complexity of value chains, as well as the emergence of a greater number of interdependence relationships between the need to build and maintain cooperative relationships between the firms that make up the chain is evident.

External economies, the provision of public goods and the coordination of activities throughout the value chain (or complex) have been mentioned so far. However, there are other forms of cooperation involving respect for certain "competition rules" in the face of changing situations (Lorenz, 1992, p. 179; Cooke, 1998, p. 22). The following describes some of the theoretical conceptualizations of each author to explain the cooperative relationships between firms, after which the similarities and differences between them are summarized.

Figure 2. Types of industries in Japan



Source: Sayer, 1989, p. 684.

3.5. Theoretical conceptualizations of cooperation relations between firms

In the revised works addressing the theoretical conceptualization of cooperation, different terms were found, depending on from which literature the subject is addressed; however, in all cases reference is made to a balance between competence and cooperation, emphasizing that these behaviors are not opposite, but that they form a dynamic in the relations between firms.

Patchell (1996) is based on Axelrod's definition of cooperation (1984), who uses game theory to explain why cooperating strategies over non-cooperative strategies can succeed in inter-signature interactions. According to Axelrod, "cooperation is defined as a voluntary relationship in which the parties search selfish benefits that are mutual and whose evolution is promoted by the location of a population" (Axelrod, 1984 in Patchell, 1996, p. 481). Based on game theory, specifically the Multi-Iteration Prisoner's Dilemma, Axelrod (1984) investigates the cooperative (or desertion) relationships between signatures. The author finds that cooperating strategies can successfully invade a population of non-cooperative strategies. These results have been replicated by other authors (Nowak, 2006, pp. 71-91).

According to Patchell (1996), cooperation between firms serves to mediate between competition and control. The author refers to the control as the proportion of profits corresponding to each firm participating in an economic transaction. In this context, cooperating implies the ability of each firm to cede the other firm part of the control on proportion of the total profits it owes (Patchell, 1996, p. 487). To do this, there

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must be a level of trust that allows each firm to expose itself to the other signature(s) adopting opportunistic behavior and still the outcome to be one in which relations maintain their cooperative character. For the author, for each of these elements (cooperation, control, competence) there is a situation in which, in the absence of a balance in the case of incurring an excess, there can be an undesired scenario. Excessive cooperation between firms can lead to collusion between them in a way that it suffocates horizontal or vertical competition, promotes assignments not based on efficiency criteria and loses competitiveness. An exacerbated competition can lead to the kind of exacerbated rivalry that, by transforming into a cost-cutting race, can damage the established confidence and affect coordination across the chain. Finally, an unbalanced level of control may become a repression in which some firms abuse their power to the detriment of others, affecting the networks of trust and cooperation built (Patchell, 1996, pp. 484-485). This is how cooperation is understood as a mediator mechanism between a desired level (and type) of competence and control over the benefits generated.

From sociology and economic sociology, Trapido (2007) defines cooperation using the concept of interdependence (Emerson, 1962 in Trapido, 2007). In its definition, competition consists of a struggle between two firms for the resources of a third party and the extent to which this struggle is carried out independently (pp. 166-167). Cooperation consists on the management of interdependence on a continuous spectrum where, at one end there is pure independent competition between firms and at the other, there is the merge of signatures; in the middle there are the actions in which firms cooperate to achieve their objectives (p. 167).

Despite using different terms, both conceptualizations recognize a degree of interdependence between firms as economic agents and perceive the process of cooperation as a balance between pure competition and collaboration between the two actors. This notion is also found in the literature review conducted by Newlands (2002), in which it is one of the three dimensions used to compare the different theoretical approaches on industrial clusters.

Likewise, Lorenz (1992, p. 179) refers to cooperation as the adherence to certain "competition rules". This would constitute a third form of cooperation identified in the regional development literature, together with the provision of public goods and production coordination activities throughout the chain mentioned above. Adherence to certain competition rules seeks to prevent the rise of a kind of neck-to-neck competition between signatures, a zero-sum game or what Trapido (2007) calls a "negative interdependence"; i.e., a situation in which both firms perceive their profits to be directly proportional to the losses of the other (Trapido, 2007, p. 166). "Competition rules" take other names when taking concepts from collective action literature, as seen in Cooke (1998).

Another concept used to explain the different types of competition is the distinction between what has been called a "high" (or "noble") path and a "low path" (or "less noble") of competition between companies (Schmitz, 1995, p. 541; Loveman & Sengenberger, 1991, p. 27; Ornston, 2014). The "noble path" refers to competition processes through quality improvements, product innovation, decreased response time and other dimensions that do not involve what would be the "less noble" competition that, on the other hand, implies the decrease in prices, labor flexibility, cheap employment

and the use of lower quality materials (Schmitz, 1995, p. 541). In Schmitz's literature review of industrial district cases in developing countries, it is common to find the application of different grades of both types of competence (Schmitz, 1995, pp. 541-542).

In industrial agglomerations, this type of neck-to-neck competition based primarily on cutting costs in whatsoever to gain a greater share of the market leads to "price decline, theft of trained staff from other firms, a vicious cycle of lack of investment and depreciation and devaluation of work" (Florida & Kenney, 1990 in Patchell, 1996). The type of desired competition in the relationships between firms is an "interdependent competition" or "horizontal competition", where each firm employs different generic strategies (Porter, 1985) and benefits from the advantages derived from the whole industry competitiveness: attracting investment, discouraging new competitors from entering the market, contributing to market development and improving the structure of industry (Porter, 1980 in Patchell, 1996, p. 489). It seeks to foster competition through innovation processes, quality improvement, segmentation and supply specialization, in order to promote improvements in quality, development of new products and the completion of production, for the benefit of collective competitiveness of the entire agglomeration. Maintaining this type of competition requires firms to adopt certain competition rules and even, faced with unfavorable international circumstances, to rely on times of declining external effective demand. Maintaining the cooperative-competition balance, this statement does not reject the need for "local rivalry" to encourage investment in innovation processes and constant improvement (Porter, 1990, p. 80).

Adherence to certain competition rules makes it possible to prevent the exploitation of chain vulnerabilities that favor the individual opportunism of firms. In the changing circumstances of international demand, the lack of trust and cooperation between firms could translate into opportunities for firms to prioritize their individual short-term profit and harm other firms in the network. If one or more firms adopt opportunistic behavior, networks of trust are broken to the detriment of the entire chain or complex of value, collective efficiency and competitiveness. Similarly, the need to cooperate is also evident in value chains involving large firms and their subcontractors, so as to ensure the survival of all in the market. In this case, cooperation makes it possible for large firms to support them instead of being enlisted in their subcontractors. Japan's experience is an example of relationships between strategic collaboration rather than exploitation firms (Loveman & Sengenberger, 1991; Sayer, 1989).

Finally, Rabelloti (1997) identifies another dimension of collective efficiency that explains the heterogeneity observed in the performance of firms and their use of cooperation mechanisms available in the district. There are certain actions within collective cooperation actions that benefit a large proportion of the district's firms (but the entire district) and whose benefits are not excluded. But, there are also other actions whose benefits are excluded and that could be considered "club assets" in the sense that only cooperating firms receive their benefits. In this way, they function as a reward for having cooperated, and increase incentives to cooperate. Examples include: exchange of information, technology, know-how or human capital, monetary exchange, reputation that serves in future interactions with district signatures (Rabellotti, 1997, p. 39). Finally, the ability of each firm to take advantage of access to the benefits derived from cooperation actions would also explain this heterogeneity (pp. 39-40).

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3.6 Factors that enable the emergence of cooperative relationships between firms

What factors explain the emergence and sustaining of these types of cooperation between firms (the provision of collective goods, coordination of activities in the chain, adherence to certain competition rules) in the revised regional development experiences? The next section identifies the factors mentioned in the literature, which are repeated in most of the revised papers.

In line with Axelrod's findings (1984), for firms to choose to maintain cooperating behavior, they should anticipate that interaction with another signature(s) will be repeated. This is the case of firms in an agglomeration as, being geographically located, their interaction with the other firms is expected to be repeated in the future. Therefore, for each firm, the expected benefits of adopting cooperative behavior are greater in the long term than the alternative of adopting opportunistic behavior that would bring short-term benefits (Lorenz, 1992; Rabellotti, 1997, pp. 37-38). Patchell calls this situation as the space-time constraint (Patchell, 1996, p. 492). The temporary aspect of the restriction is given by the character of long-standing trade relations between economic actors, which is the case in several of the revised experiences (Rabelloti, 1997, p. 38; Sayer, 1989; Piore & Sabel, 1984; Kamnungwut & Guy, 2012).

The second factor in achieving a cooperative result is the existence of reciprocity (Patchell, 1993, p. 493; Schmitz, 1995, p. 541). Those firms that choose not to cooperate should expect retaliation from the rest of the group; this loss of profits acts as a disincentive to adopt opportunistic behavior. This observation is present in the application of the Prisoner's Dilemma to this context (Axelrod, 1984). The most successful strategies were those that replicated the behavior of the other player; i.e., once the other player (or any of the other players) chooses not to cooperate, the firm stops cooperating as well (Axelrod, 1984 in Patchell, 1996, pp. 485-486). Something similar is found in selected works reviewing empirical cases, which mention the need to sanction firms that do not adhere to the established "competition rules", in most cases, informally. Lorenz (1993) mentions social sanction as a social control mechanism that ensures the maintenance of cooperation in a community. In the research on the cooperation of various local actors to attract private investment to localities in Ohio (USA), Cox and Wood (1997) mention the importance of trust in the network of relationships between actors linked to local economic development and the widespread knowledge that a betrayal of this trust ("honor code") would result in the exclusion of future attraction processes (Cox & Wood, 1997, p. 83).

Lorenz (1992) mentions another observation absent in the rest of the revised work: the need for mechanisms that can more equitably redistribute the benefits obtained by the entire production complex (leveling mechanisms), which can include unemployment insurance, redistribution of external demand to less successful firms and access to credit (Lorenz, 1992, p. 179). According to the author, increasing economic inequality between the signatures of an agglomeration can lead to mistrust and questioning the interdependence of the entire network. At the same time, if these mechanisms result in excessive redistribution, they can result in discouraging investment in innovations and improvements. Therefore, a balance must be found between

rewarding entrepreneurship initiatives without inequality in the entire agglomeration growing excessively. In this sense, the need for an adequate governance system from which all firms participate becomes more evident (Lorenz, 1992). Ornston (2014) reports an increase in labor force inequality (between white-collar and blue-collar workers) in the process of cracking cooperative relations in Finnish industry (Ornston, 2014, p. 460).

The willingness to maintain cooperative relationships with other firms depends on the information each firm has, and their beliefs about the behavior of other members of the cluster, district or network. If firms believe that the rest of the companies will adopt opportunistic behavior, then they will choose to do the same, making it impossible for the emergence of cooperation processes. Therefore, a certain level of trust between firms is required to arouse cooperative relationships. All reviewed works identify trust as a third determinant in successful cooperation between firms.

The presence of strong community ties is one of the factors frequently cited in the literature to explain the existence of networks of trust and the emergence of sustained cooperation processes. In communities where members share values, beliefs, certain cultural traits that make them a territorial unit with a strong social fabric, it is easier for them to advocate a high level of trust. In Rabellotti, this aspect is one of the characteristics that separates an industrial district from the rest of the type of geographical agglomerations: the existence of "a strong and relatively homogeneous social and cultural background that links economic agents and creates a common, sometimes explicit, but often implicit, and widely accepted" code of behavior (Rabellotti, 1997, p. 23).

The existence of:

> A social capital of a cultural, communal, ethnic or religious nature that produces a sanction strong enough to prevent a breaking of the rules in the first place, or to provide a strong enough basis to repair that damage (Cooke, 1998, p. 18)

Comparing Silicon Valley's experiences with Route 128, both technology clusters in the United States, Trapido (2007) highlights in the first the existence of a business culture open to cooperation as a factor that makes it possible to exchange knowledge between firms; meanwhile, the second experience is recognized for its reluctance to this type of cooperation (Saxenian, 1994 in Trapido, 2007, p. 170). One of the hypotheses examined by the author in his study of cooperation in the venture capital market is precisely the cultural hypothesis of the emergence of cooperation (Trapido, 2007, p. 170). Felzensztein (2008) also identifies greater social cohesion and "collectivism" as a factor that facilitates cooperation between firms in marketing activities (p. 240). Neto (2008) mentions the lack of trust and a tradition of cooperation among the barriers to cooperation in Latin America.

However, there is also evidence of contexts of cultural cohesion that hinder the emergence or deepening of cooperation between firms. Patchell (1996) mentions such a case in Guangdong (China) where relations between firms are strongly crossed by kinship ties to the point that they limit the entry of other firms and, therefore, horizontal competition that balances collaboration between signatures. Schmitz (1995) also reports a similar case in a shoe production district in Agra, India (Knorringa, 1994 in Schmitz, 1995, p. 541). The role that networks of trust plays in the balance

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between competition and cooperation is not entirely resolved; however, the evidence is strong about its importance in the emergence of cooperation between firms.

Other revised works mention the existence of trusted networks built not from shared cultural background, but from repeated past interactions between firms. Using data from the U.S. venture capital market, Trapido (2007) confirms the hypothesis that companies that were competitors in the past are more likely to cooperate in the future. His explanation lies that, having competed in the past, firms are aware of the existence of the other, which leads to them being personally known and able to build a level of trust that would enable cooperation actions (Trapido, 2007, p. 169). Another similar case in the U.S. semiconductor industry is described in Thornberry (2002), in cooperation in research activities; in the latter example, there are some case-specific variables that contributed to its success.

A certain degree of confidence allows some of the coordination to be carried out through informal agreements, which gives the entire production complex the flexibility to change aspects of production to arise the need, without having to worry about rigidities of formal contracts (Patchell, 1996, p. 494; Acs & Fitzroy, 1989, p. 313).As these arrangements are maintained and respected, the value chain (or complex) builds a competitive advantage as it has a level of coordination that makes it flexible, and the necessary risks can be taken to make investments and get involved in innovation processes (Lorenz, 1992, p. 180).

Another recurring aspect of the literature of cooperation between firms in regional development experiences is the institutionalization of cooperation and governance mechanisms for their maintenance over time. In this regard, Patchell (1996) emphasizes the need for an external control mechanism to the firm, in which decisions on aspects of production and control of the proportion of profits corresponding to each firm are not internal to a nuclear firm, but are shared among the firms involved in the transactions: "As production becomes more sophisticated, the need to ensure external governance of development, quality, cost, distribution and increase in profits becomes higher (Patchell, 1996, p. 491). On the other hand, Raco mentions the advantages of institutionalizing cooperation mechanisms through associativity as a means of deepening cooperation mechanisms; his work focuses on the aspect of constant learning and dissemination of information as a source of competitiveness of the cluster, so this type of institutionalization would generate additional channels for collective learning (Raco, 1999, pp. 954-955). Literature focused on this aspect and also on the actions that these institutions can take to promote cooperation between firms, as well as public policies aimed at promoting regional development based on cooperation between actors economic is quite broad.

3.7 The innovative region and emerging economies

At this point, it is worth mentioning another approach identified in the literature that focuses on regional innovation and learning processes, which give technological dynamism to the region and which is the result of cooperation between firms. This literature focuses on geographical agglomerations as environments of innovation and learning where a "culture of learning" can emerge (Cooke, 1998). Production coordination activities across the value chain result in learning processes that can lead to inno-

vations that increase the competitiveness of the region. Patchell (1996) mentions the emergence of "relational skills" developed from the cooperative relationships between nuclear firms and their subcontractors. The latter are specializing and adjusting their production to the demands of nuclear firms, while they adapt to external demand, and through a sustained process of cooperation and coordination, it is possible to build skills that increase the competitiveness of the complex, which are specific to the industrial organization of the chain and that maintain a degree of flexibility. In other words:

> Specific relational skills contribute to the region's upgrading by opening up opportunities for subcontractors to increase demand for their assets through transactions with other nuclear firms, and the opportunity for these nuclear firms to take advantage of the development of its subcontractors, with the possibility of expanding into new production systems (Patchell, 1996, p. 492).

These processes allow the region to move from learning by doing to learning by learning (Cooke, 1998, p. 17-18). The emphasis on quality learning from the institutionalized cooperation networks into clusters is also mentioned by Raco (1999). This aspect of collective learning also characterizes the school of innovative milieux (GREMI group), according to the Newlands classification (2002, p. 525).

However, authors were found to nuance this established relationship between innovation, geographical agglomerations, technology-intensive activities and cooperation, particularly with regard to bias towards high-tech industries (Lundvall, 2007, p. 9). In the review of the case for the development of technology-intensive industries in Finland, Ornston (2014) notes the success of the strategy resulted in a cracking of cooperation between firms by capitalizing the networks of cooperation inherited from the post-war period. To explain this outcome, Ornston (2014) points to two factors. First, the nature of these industries makes them vulnerable to disruptive innovations that destroy previously built capabilities; and second, the highly competitive nature of these industries exacerbated the unwanted competition described above (Ornston, 2014, p. 460). Thus, although these networks of cooperation (not only between firms but between employers and workers, and with state actors as well) enabled the successful development of high-tech industries in Finland, they turned out to be the price to pay. The themes addressed in this work nuance the cooperative-innovation-technological dynamism relationship, while highlighting other important factors to be taken into account on a case-by-case basis, such as the nature of the specific industry

3.8 Factors external to the district or cluster

One dimension found in almost all reviewed works is the effect that external factors can have on the cooperative relationships between firms. Rabellotti (1997) mentions the importance of not considering cooperation or the agreements that enable it as unchanging institutions over time. For example, in its analysis of the Sino Valley industrial district in southern Brazil, Schmitz identifies changes in the forms and levels of cooperation between firms due to external factors (Schmitz, 1995, p. 547). Lorenz also mentions the cracking of trust and networks of cooperation in the industrial districts of Saint-Etienne (France), the German industrial districts, and in

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the industrial districts of Birmingham and Sheffield (Britain) (Sabel & Zeitlin,1985; Herringel, 1990 in Lorenz, 1992, p. 179).

In this regard, Raco (1999) criticizes the literature of the New Industrial Districts. This literature focuses on the endogenous aspects of the region to explain its success, ignoring those external aspects of national or even global political economy that may play a role in explaining unequal development in a country or region; thus, they constitute only a partial explanation of the process (Raco, 1999, p. 963).

Focusing on local proactivity ignores the broader contexts in which localities operate, and thus the development of local institutional capacities merely encloses them into a vicious spiral of competition for global mobile investments (Harvey, 1989; Leitner, 1991; Kantor, 1995 in Raco, 1999, p. 963).

An example of competition for mobile domestic investments is seen in Gordon (2007).

4. Conclusions

The theoretical conceptualizations of cooperation in regional development literature can be summarized in four dimensions according to the most relevant topics identified in the discussion.

- The industrial organization composed of vertical and horizontal relations between the firms and whose complexity requires cooperation between them.
- The need for a balance between cooperation and competition in the relationships between firms to maintain the competitive advantage of the region. Within this dimension, emphasis is placed on learning and innovation processes emerging from cooperation.
- The need for a qualitative background that allows the emergence and existence of trust networks and governance mechanisms that allow social control of the members of the region, promoting reciprocity and adherence to the agreed codes.
- The dynamic nature of cooperation relationships and the effect that external factors can have on their maintenance.

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