TÍTULO DE LA COMUNICACIÓN: Resources, governance and knowledge transfers in industrial clusters: Can local firms be locked-out by their crucial partner?

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RESUMEN: How internal resources, relational resources and relational mechanisms determine knowledge transfers among crucial partners in clusters? We analyzed a sample of Spanish footwear manufacturers to distinguish the relative impact of internal resources, intra-cluster relationships and governance (particularly power asymmetries) on knowledge transfers among lead firms and their skilful partners. Internal resources appear to be highly beneficial for knowledge transfers among partners, while intra-cluster relationships demote the mentioned transmissions. The governance structure of the partnership also appears to exercise an important influence on knowledge transfers among leaders and their suppliers. These results lead us to suggest valuable implications for practitioners, researchers and policy makers at both firm level and meso-level.

PALABRAS CLAVE: relational resources, knowledge transfers, clusters, governance.
1. INTRODUCTION
The academic interest in clusters or industrial districts has its roots on the pioneering works of the Weber's location theory and, overall, the Marshallian industrial economics. Scholars coming from different disciplines have intensively analyzed many aspects of these industrial organization systems such as formation mechanisms, particular characteristics, structures, evolution or performance (Becattini, 1992; Porter, 1998; Gordon and McCann, 2000, Pike and Sengenberger, 1992, among many others).

During an extended period of time, it has been taken for granted that the participation of local firms in networks and informal ties are crucial for the creation of new product and processes. Continuous and repeated interactions in a trustful atmosphere enhance the information sharing and knowledge spillovers that sustain the innovation processes (e.g. Cooke, 2005). Through knowledge flows in networks or ties, clustered firms benefit from a broad pool of external knowledge. However, recent research transcends the dominant paradigm of externalities and generalized knowledge spillovers thanks to geographical proximity, to an in depth analysis of firm level characteristics, networks particularities and the limits of clustering effects (Giuliani and Bell, 2005; Giuliani, 2007; Boshma and ter Wal, 2007; Giuliani, 2008, among others).

Despite the vastness of the literature on innovation, networks and clusters produced in the last decade, little has been added to the effects of governance structure and power asymmetries on knowledge flows (Christopherson and Clark, 2007; Reinau and Dalum, 2008). This study aims to contribute to the academic debate on innovation in clusters, looking in particular at the effect of firm's internal resources, inter-firm relationships and governance structure (including power asymmetries) on knowledge transfers. Even more, we aspire to take one step forward by evaluating whether governance and power play a role in the evolution of the industrial clusters or they are partly responsible for some aspects of the innovative performance of clustered economic actors. To such end, we assume that networks and clusters are relational structures regulated by the interplay of the power of the actors involved (Sacchetti and Sugden, 2003; Humphrey and Schmitz, 2004; Parrilli and Sacchetti, 2008).

This paper is organized as follows. Section two illustrates the theoretical framework on which the paper is developed, and the hypotheses to be tested. Section three provides detailed information about the Spanish clusters considered. In section four, we present data and sample issues, variables, statistical analysis, and discuss the main empirical findings. Finally, section five summarizes the novelties of the paper, indicates limitations, and suggests some implications for practitioners, public policies and future research.

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1 Reinau and Dalum (2008) specifically pointed out how cluster literature has largely ignored the notion of power with a few exceptions like Bathelt and Taylor (2002)
2. THEORETICAL FRAMEWORK

2.1 Clusters: definitions and evolution trajectories in the modern economy
Porter (1998) defined clusters as geographical concentrations of interconnected companies, specialized suppliers, service providers in related industries, and associated institutions in particular fields that compete and cooperate. Since this seminal conceptualization, theoretical and applied researches coming from diverse academic fields have deeply analyzed and enriched the term; leading to a plethora of different terminologies (Lorenzen, 2005) and certain semantic ambiguity, see Gordon and McCann (2003) or Belussi (2006) regarding literature on industrial districts versus clusters.

Although with differences, a common point connects all these research trends. Thanks to geographical proximity, clustered firms enjoy the benefits of knowledge externalities and engage in cohesive local networks that enhance fine grain knowledge transfers in a trustful atmosphere. However, research based in this assumption has traditionally overemphasized the role of the spatial dimension, relegated the cluster internal heterogeneity and postponed several questions linked to the evolution of the territorial agglomerations (ter Val and Boschma, 2009).

Many authors have attempted to classify industrial clusters in order to understand their structure and evolution (Mytelka and Farinelli, 2000; Rugman and Verbeke, 2003; Poudre and St. John, 1996; Enright, 2000; Immarino and McCann, 2006; Paniccia, 2006). The most recent typologies offer a much more sophisticated theoretical framework. However, Reinau and Dalum (2008) recently signalled that the extensive empirical classification by Markusen (1996) still holds the key to the most relevant classification. Through inductive inquiries, she came up with a categorization based on three classificatory principles: firm size, interconnections between firms and internal versus external orientations. In addition to the Marshallian formulation (including Italianate variant), three more categories of clusters were proposed the hub-and-spoke, the satellite platform, and the state anchored. Although, hybrid cluster structures that amalgamate one or more of these types, clearly predominate.

Following Markusen (1996), the Marshallian cluster is a geographically delimited area where the business structure is comprised of small, locally owned firms that keep investment and production decisions within the district boundaries. Extensive intra-district trade takes place among local units. This system of industrial organization is relatively stable and secluded, facilitating the emergence of a solid local identity and shared industrial expertise. The Italian districts are advanced forms the traditional Marshallian formulation as consider collaborations between local actors as important drivers for the development of clusters. Conversely to the Marshallian formulation, Markusen's (1996) Hub-and-Scope clusters are structured around a few dominant firms supporting the whole cluster, while suppliers and related activities spread around them. Intra-district cooperation, mostly of vertical nature, is driven by the willingness of the hub firms and is based in contracts and commitment. Local lead firms present a substantial
number of ties with actors outside the industrial agglomeration. The dynamics of the cluster is largely determined by the success of failure of the hub-firms.  

After deeply reviewing the referenced typologies, a missing link can be identified: the role of governance and power relations among cluster units (Reinau and Dalum, 2008). By introducing a more dynamic perspective, recent research have highlighted the role of governance and power in cluster internationalisation or innovation trajectories (i.e. Parrilli and Sachetti, 2008; De Propis et al, 2008). In general terms, a growing tendency towards a more market concentration and more market power, embodied by leader firms and business groups, can be perceived in many Marshallian industrial districts (Boschma and Lambooy, 2002; Parrilli, 2004; Rabellotti, 2004). Such a trend is progressively transforming the Marshallian districts in Hub-and-Spoke clusters, presented by Guerrieri and Pietrobelli (2004) as the optimal structure not only in developing, but also in developed countries.

2.2 Inter-firm relationships, governance and value creation

Knowledge flows through networks of formal and informal ties enable firms to build many innovations upon the broad pool of knowledge existent outside the boundaries of the firm. For example, along the value chain, knowledge transfers among actors are persistent. On the one hand, suppliers cooperate with their customers in order to provide with inputs that help them to reinforce and complete their product offering (Teece, 1986). On the other hand, customers frequently provide innovation opportunities or polish supplier’s proposals (Von Hippel, 2005). The corollary, as recent research in industrialized countries evidences, is that the development of new capabilities frequently varies as a function of the nature of collaborative relationships among chain units (Dyer and Hatch 2006, MacDuffie and Helper 2006).

Networks are not always made of homogeneous players, neither correspond to customer-supplier relationships or present high levels of formalization. In fact, there is a considerable variety in the way networks are structured due to the multiplicity of ties and the heterogeneous characteristics of the actors involved (Powell, 2001). So, it can be argued that each network has its particular structure and governance, that is the process by which activities and conflicts among various actors are coordinated and managed (Hollingsworth, 1993). More recently, drawing upon local systems, de Propris et al. (2008) conceptualized the form of governance as the distribution of power across the firms integrated in the networks and other local stakeholders.

The issue of power in inter-firm relationships has been relatively postponed. Traditional literature has highlighted mostly the trustful and cooperative atmosphere of the local innovation systems (Asheim and Isaksen, 2002). However, a closer look at the local system confirms that some positions in the network offer

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2 The Satellite platform cluster is a congregation of branch facilities of externally based multi-plant firms. In the State anchored cluster, a public or non-profit organisation located in the area induces the economic activity and clearly influence the evolution of the territorial agglomeration. The link with the anchor institution and industry specificities determines the local knowledge flows.
opportunities to exercise power (Lin et al., 2001), and thus allowing the powerful members to retain most of the value generated by the complete network.

In the modern economy, each inter-firm relationship has its particular architecture determined by the its specific power structure and hierarchy, which in turn depend upon the stock of resources of the individual firm and the types of learning processes that modify them. Power asymmetries become frequent, and should be considered as key determinants of the nature of inter-firm relationships (Sacchetti and Sugden, 2003). Generally speaking, coordination between actions of individuals can be realised by three specific forms of governance: heterarchical, hierarchical or market governance.3 When power is evenly distributed among network members and decision centres proliferate, like in the traditional ‘Marshallian’ cluster, heterarchical forms of governance emerge (Amin and Cohendet, 2005). Conversely, in hierachical forms of governance as monopsonistic clusters (de Propris, 2001), the dominant actors impose their views on other actors that are forced to make concessions permanently.

The power structure facilitates or hinders the process of capability building or adaptability of the network members or the whole local system. Powerful firms are able to make key decisions about suppliers selection, distribution of activities and structure of production. Consequently, the implications of power asymmetries are evident for both firms and territories. Profits, and hence resources for innovation and growth, gravitate to points of concentration of power and linked firms are exposed to differing degrees to risk (Milberg 2003, Hingley 2005, Pietrobelli and Saliola, 2008).

However, governance forms should not be based on the presented conception of power (hierarchy) exclusively. In his typology, Allen (2003) also recognizes a networked conception of power and governance derived from the interaction in networks, with resources being the medium through which power is exercised (Hess, 2008). In this approach, governance should be understood as a form of coordination between interacting units. Firms’ resources, product profile and knowledge flows determine the characteristics of this coordination system (Gereffi et al., 2005).4 This form of governance, and its underlying notion of power, does not ignore the existence of coercion and power asymmetries. However, it pays attention to cooperative relations of trust and embedded ties, as well as provides opportunities for the empowering of the actors involved in the relationship. As Hess (2008) pointed out, this networked conception allows the emergence of win-win situations, avoiding the zero-sum game assumption linked to previous conceptualizations of governance and power.

3. HYPOTHESIS

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3 In current policy processes with regard to spatial planning, van Buuren and Eshuis (2010) claim for a fourth type of governance which can contribute to the capacity of actors to coordinate their actions by the development of public ideas, competencies and arguments.

4 Gereffi, Humphrey and Sturgeon (2005) pointed out how the design, production, and marketing of many goods are nowadays increasingly carried out through intermediate governance arrangements (modular, relational or captive) according to the degree to which the lead firm controls the other firms.
Literature concerning industrial clusters has often portrayed them as islands of unity and homogeneity (Samarra and Belussi, 2006; Cainelli and Iacobucci, 2007). However, this idea of homogeneity is far from being confirmed by the facts (Boshma and ter Wal, 2007; Morrison, 2008). This traditional perspective possibly overemphasizes the role of the geographical dimension, overlooking the evidence that firms exhibit important differences in terms of absorptive capacity and economic power (Cohen and Levinthal, 1990; Boschma and Labooy, 2002). Following this trend, Sammarra and Biggiero (2008) stress the heterogeneity and specificity of inter-firm knowledge flows in innovation networks. In their recent research, they point out that knowledge transfers among units engaged in cooperation activities depend on the nature and properties of the knowledge to be transferred, partner-specific characteristics and the structural features of the social networks.

Cluster firms largely differ in terms of knowledge bases or absorptive capacity (Giuliani, 2007; Giuliani and Bell, 2005). Firms with strong internal resources can generate knowledge flows, absorb external knowledge and exploit it successfully (Cohen and Levinthal, 1990). Pervasive internal innovation efforts contribute to firm’s knowledge conception and expand its absorptive capacity, favouring firms’ involvement in knowledge transfers and allowing them to increasingly benefit from information sharing. The implications are immediate, knowledge appears to be unevenly diffused and selectively shared among cluster units. Firms with weak knowledge bases are progressively relegated in the knowledge network as they “neither offer anything of value to other firms nor have the internal capacity to absorb external knowledge” (Dantas et al., 2007: 33). Consequently, firms with weak bases are usually engaged in a reduced number of knowledge transfers, as they only offer minor contributions to common interest. Conversely, strong knowledge base enhances valuable information flows among independent firms. Morrison et al. (2008) point out how leading firms prefer to exchange knowledge with expert partners (even outside the cluster) instead of exchanging knowledge with non-expert firms within the clusters. Saliola and Zanfei (2009) evidenced that knowledge intensive relationships are positively associated with the technical capabilities of local companies. So, in line with these arguments and the recent contribution by Van Wijk et al. (2008), we can hypothesize(see figure 1):

\[ \text{H1: Higher firm's internal innovation efforts may positively influence knowledge transfers among crucial partners} \]

Relational resources have been related to learning and innovation phenomena (Boschma and ter Val, 2007; Owen-Smith and Powell, 2004; Ahuja, 2000; Zaheer and Bell, 2005). Cohesive and dense networks have positive effects as they generate social norms and sanctions that facilitate cooperative exchanges in a climate of trust and mutual confidence (Coleman, 1990). Similarly, the strong-tied argument suggests that strong ties promote fine grain information flows (Hansen, 1999) and they act as mechanisms of social control governing the interdependencies in partnerships (Kogut, 1996).

Extensive literature evidences that spatial proximity favours embeddedness (i.e. Watts et al. 2006), and local interactions through social relationships
Persistent contacts between local units encourage dense networks in which shared values and widely accepted norms materialize. Therefore, valuable information transfers are more likely to occur in dense networks, as their actors usually internalize the norms that discourage opportunistic behaviors and emphasize trustworthiness (Granovetter, 2005). The corollary is immediate, proximity in clusters remains as a crucial factor for the development of dense networks, mutual confidence and knowledge transfers.

However, from the relational perspective, industrial clusters are not homogeneous. As Morrison and Rabellotti (2009) evidenced, different sub-networks of actors coexist in these industrial organization systems. Consequently, each local unit designs its own network portfolio, and obviously exhibit differences in terms of behaviour and outcomes (Zaheer and Bell, 2005). Such engagement in more than one network may produce negative collateral effects. For example, cooperation with cluster lead firms and large groups implies high cost for small local units. Considering that networking takes time and effort, small cluster firms may opt for focusing mostly in the crucial partner to survive. By following this path, firms probably are locked-out from many of their traditional dense relationships. They tend to minimize investments in local networking, because the overload of loyalty and commitment in the focal relationship acts as a powerful inhibitor factor.

Additionally, in advanced stages of the industry life cycle, perception of symbolic and aesthetic features of new products becomes extremely important for market value perceptions (Frenzel, 2007). Taken this perspective on product characteristics, innovative products do not need to be technologically different; in fact, novel designs may distinguish novel from older products. As markets mature, customers get their functional requirement satiated (Adner, 2004) and technological innovations are exceptional (Tripsas, 2007). The rising importance of new product design engenders deep changes in the appropriation regime in traditional industries (Frenzel, 2007; Trullen and Boix, 2009). Considering that competitors can imitate new product designs more easily than technological innovations, innovative firms become highly sensitive to rivals opportunistic behavior (Frenzel, 2007). Thus, the integrity of recipient firms facilitates transfers of explicit knowledge (Becerra et al, 2008). When competition increases, due to easier and quicker imitations by competitors, innovators tend to be cautious about potential leaks of valuable information. Knowledge transfers are drastically reduced if partners exhibit tight linkages with other local units due to risk of information diffusion or lack of integrity. Consequently, as figure 1 reflects, we may hypothesize:

\[ H2: \text{Dense intra-cluster linkages may negatively influence knowledge transfers among crucial partners} \]

According to Provan and Kenis (2008), network governance has important impact on network effectiveness. Therefore, if we understand governance as the way power is exercised, power emerges as a determining factor of the interactive

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\(^5\) Previous empirical research also points out how pre-existing local networks can equally lead to a reproduction of anachronistic practices and capabilities. (McDermott 2002)
dynamics in these structures. Although Noteboom (2008) claims that governance in network must be multilateral, in equilibration of power or dependence, somehow. Power imbalance partially explains the construction of inter-firm routines and the sharing of knowledge (Mason and Leek, 2008). Additionally, recent meta-analysis by Van Wijk et al.’s (2008) reveals that power issues have a pronounced effect when considering inter-organizational knowledge transfers. In this vein, we assert that power asymmetries between organizations may exist, and determine the intensity of knowledge flows.

The Global Value Chain approach provides valuable insights into the role played by governance structure in clusters (Humphrey and Schmitz, 2004; Bazan and Navas-Aleman, 2004). For example, lead companies exercise power and control over most of the network members in Hub-and-Spoke clusters. Consequently, inter-firm relationships are based on direction and control, and there is room to exploit a powerful or central position in the network. Firms occupying the central positions control interactions of other network members (Hanneman and Riddle, 2005). In this line, Giuliani and Bell (2005) have signalled that knowledge transfers among local firms are influenced by powerful actors such as leading firms or groups. In clusters, leading firms frequently act as knowledge gatekeepers with their main partners by providing them with valuable non-local knowledge (Morrison, 2008). Conversely, the “Marshallian” cluster presents more horizontal types of networks, and relationships tend to be based on participatory forms of governance (Parrilli and Sacchetti, 2008). The mutual dependence between partners or cooperating firms invites to jointly delineate key parameters through participatory rules, share values and objectives (Humphrey and Schmitz, 2004). Governance in the “Marshallian” cluster type is frequently used to denote some form of co-operation between “equal”, there is no single agent with enough power over other participants.

Local firms with weak knowledge bases exhibit significant dependence on leading firms for advanced production methods, design or marketing. The lead firm appears as the core of a very hierarchical system, and is in charge of introducing the new production processes and products. Only the less strategic competencies are shared with the other actors. Otherwise, firms giving up the core assets will automatically reduce their power and worsen their position in the network. In this context, knowledge transfers from leaders may be episodic or limited, so the development of small local partners can be constrained. This “low road” competition emerges as the worst scenario for cluster producers and the whole local system (Kaplinsky and Readman, 2001). By contrast, the “Marshallian” clusters reduce the dependency of small local units on lead firm’s specific assets. Non-hierarchical networks enhance collective learning processes through continuous interactions and knowledge transfers. Small local firms may reinforce their core competence thanks to pervasive knowledge transfers, and therefore improve their position in the network structure. In consequence, as figure 1 shows, we decided to hypothesize:

\[ H_{3a}: \text{More Hierarchical (power based) governance structures may positively influence knowledge transfers from lead firms to their partners.} \]
More Hierarchical (power based) governance structures may negatively influence knowledge transfers from partners to lead firms.

4. THE STUDY SETTING

4.1 The territorial agglomerations in the Spanish footwear industry

This paper focuses on the analysis of the relationship between inter-firm linkages, power asymmetries and knowledge transfers and innovation in clusters. To such end, we used information from the Spanish footwear industry, which is a globalized manufacturing industry characterized by incremental innovations and a remarkable delocalization phenomenon (Belso-Martinez, 2008).

Data from the Spanish Footwear Manufacturers Federation (FICE, 2008) reveals that the industry undergoes a severe crisis since the beginning of this century. During the period 2001-2008, shoe production has declined on average by 6.2%. Such a drop in the number of pairs manufactured has its mirror image in an average fall of employment of 4.9% per year. Despite of this negative trends, the footwear and leather sector still comprises 1,832 footwear manufacturers with 29,053 workers, accounting for 1.2% of the industrial Gross Domestic Product (GDP) and 2.3% of national employment. In the European context, Spain is the second largest producer and exporter right after Italy; while ranks sixth on the world largest exporters list and eighth on the world larger importers list (Sanchez-Rodriguez, 2009).

Similarly to other European countries, the Spanish footwear industry is characterized by the prevalence of small and medium enterprises. Recent figures published by FICE (2008) show that 52.6% of the companies employed less than 10 persons, 44.1% were classified in the interval 10 to 49 workers, while only 3.3% presented 50 or more employees. Most of these SME's are geographically agglomerated, and usually exhibit high levels of specialization in concrete stages of the production process. These vertically disintegrated structures have traditionally favoured collective efficiency, and enhanced the internationalisation and competitiveness of local manufacturers in a global environment (Ybarra, 2006; Tortajada et al., 2005; Belso-Martinez, 2006; Bañuls et al., 1999).

Spanish footwear clusters have been recurrently mentioned in empirical researches, especially the largest one located in the province of Alicante, a Mediterranean region in the east coast of the Iberian Peninsula (Ybarra, 2006; Tortajada et al., 2005; Ybarra and Santa Maria, 2006; Contreras and Tomas, 1998; Ybarra. 2000; Banyuls et al., 1999; Belso-Martinez, 2008; Molina-Morales, 2008). Applying different methodologies and data, the most relevant of these territorial agglomerations has been recognized as industrial districts (Giner and Santa Maria, 2002; Boix and Galletto, 2006; among others).

The changing economic environment has severely transformed the whole sector and the major clusters. The fierce competition from low-cost countries and the
concentration in the fashion retail industry have promoted the emergence of multiple business models and the coexistence of a wide spectrum of management practices. As FICE (2008) reveals, through cooperation, entrepreneurs have redefined strategies and restructured their organisations, moving from the traditional company centred on manufacturing (with its own brand, or production only) to more sophisticated models such as market developer (with brand, control of design, quality and distribution, or simply importer and distributor) passing through multiple combinations according to product type, target market and business strategy.

The leather and components suppliers appear as the second important group of actors in the industry. In most of the cases, these firms originated as result of spinoff processes from the footwear manufacturers themselves. Prior personal relationships and the specific knowledge were the main competitive arguments of these new companies (Ybarra, 2006). This part of the sector is made up of 600 companies, basically sme’s, that currently employ over 11.000 people (AEC, 2008). Over 40% of the Spanish components and machinery are sold abroad, and the rate of exports on imports reaches 137%.

The speed to market and the persistent renewal of products demanded by fashion retailers and shoes manufacturers have led to major changes over the last decades. After an intense restructuring period, a new productive model based in quick service and innovation has been implemented by this segment of the footwear industry. Technologies, designs and materials offered by local suppliers have evolved, facilitating incremental innovations through incorporation of top quality and trendy materials (AEC, 2008). In fact, 75% of the Spanish components and machinery exports are sold in Europe, where top quality shoes are made.

Local institutions represent the third relevant local actor to be taken into account in our introduction to the Spanish footwear industry. Indeed, public and private institutions have demonstrated a noteworthy ability to consolidate the structure and enhance the economic activity of these industrial organization systems. Initially by providing highly specialized services and contributing to the materialization of a trustful atmosphere crucial for inter-firm cooperation and knowledge transfer (Tomás et al., 2000). Lately by facilitating the access of local actors to non-redundant knowledge, thanks to their role as meta-organizers or intermediate agents (Molina-Morales, 2008; Belso-Martinez, 2008).

4.2 Data and sample issues
The empirical results of this section were obtained from a research project developed in the Department of Economic and Financial Studies (University Miguel Hernandez) and financed by the Generalitat Valenciana (Regional Government). The aim of this project was to prepare an outline of the evolution and situation of the Spanish footwear industry, note that 63% of the national footwear production is concentrated in this region. Similarly to other developed countries, the shoe industry is characterized by the predominance of agglomerations of small and

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7 Asociación Española de Empresas de Componentes del Calzado is the Spanish footwear suppliers association.
medium enterprises highly specialized in specific phases of the production process.

Considering our paper interest was centred on the relationship between footwear manufacturers engaged in subcontracting operations, we first determined the population for the empirical research using the Central Companies Directory (CCD). The directory joins together in just one information system, all Spanish companies and their local units located in the country. Its basic objective is to facilitate carrying out economic surveys by sample. This is updated once a year and generates a new information system to 1 January for each period.

Data for this research was collected with a questionnaire sent to a sample of Spanish manufacturers located in the most relevant footwear clusters. The CCD, as many public information sources, exclusively provides information at aggregate level. In order to surpass this limitation, our list of footwear manufacturers to be surveyed was created using Dun&Bradstreet international. Because firms were examined only from the mentioned industry, the findings may not be completely generalised to companies from other economic sectors or countries.

As we expected to gather different data about the Spanish manufacturers and the footwear industry, a structured questionnaire was created based on combined inputs from literature, practitioners and academic expertises. Comments obtained from both groups of expertises and academics were later used to discuss the statistical results and enrich the final conclusions of the paper. The questionnaire included items covering aspects such as strategy, inter-firm relationships, firm resources or outsourcing/subcontracting activities.

Firms with more than one employee were randomly selected, and the questionnaire was submitted to entrepreneurs or managers in the survey frame early 2006. With the aim of achieving a critical number of firms per cluster and to include a wide variety of firms, we stratified the sample by size and geographical areas. Almost 63% of the establishments in the sample were located in the Vinalopó cluster (Alicante). After a careful revision, the valid responses obtained allowed a significance level of 95.5% with an error margin of 5% in the worst case ($p=q=50$). Due to the research objectives, only information provided by the 132 companies engaged in subcontracting operations during the last four years was used in the present study. We controlled for potential bias derived from this selection that may interfere with accuracy of results. No particular differences between the compared groups emerged in terms of geographical location, size distribution or export behaviour.

### 4.3 Variables

**Knowledge transfers**

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8 To detect possible bias, early and late respondent questionnaires were compared in order to observe significant differences. Our analysis revealed no significant discrepancies in terms of variables or locations. We also checked the potential existence of non-response bias. No important differences were detected regarding size or geographical distribution.
The different hypotheses test the impact of innovation intensity, governance, local institutions and inter-firm local linkages on the knowledge transfers of companies in the Spanish footwear industry. Our dependent variable, named Knowledge transfers, was built using information provided by entrepreneurs and managers about their cooperation activities. Specifically, firms were questioned whether they cooperate with their subcontracting partner in the following areas: a) product design and development, b) organizational and financial management, c) manufacturing processes, d) logistics and marketing, e) education and training. On the basis of the answers obtained, a five level cumulative variable was constructed for the number of business areas in which the firms cooperate. This specification of the dependent variable assumes that the more areas the firm cooperates, the more knowledge transfers exist.

The following step was to build four different factors that will represent our main explanatory variables and allow us to achieve the objectives established previously. To this purpose, we operationalized these variables as follows:

**Internal effort**
In order to gather data about firm’s internal innovation activities, our survey requested information about product design and development innovation intensity and marketing innovation intensity. Considering Marsili and Salter (2006), the observed variables were operativized as follows: % design and product development expenditures on total sales during the last three years, and % marketing expenditures on total sales during the last three years. In order to achieve a more accurate picture, these objective indicators were combined with the entrepreneur perception about the innovative character of firm’s product design and marketing activities. Using factor analysis technique, data obtained through the mentioned variables was condensed in a single composite factor (named Internal efforts), evidencing eigenvalue= 1.26 and 62.75% of total variance explained.

**Local inter-firm linkages**
We investigated the strategic relevance, the intensity and the stability of the relationships between local units (vertical and horizontal patterns). To determine the characteristics of these linkages, top managers were asked to rate: a) the strategic relevance of the different linkages with clients and suppliers; b) the stability and intensity of the resources shared among each type of relationships. We applied a 5-point likert scale where 1: very low and 5: very high. Internal validity and consistency of the construct (named Vertical relationships) was checked. Results obtained achieved Cronbach’s alpha over 0.85, validating the aggregation of the four items in one independent variable.

**Local institutions links**
In order to facilitate the responses, we used a similar configuration to that of the previously described local inter-firm linkages. Considering operativization applied by Molina-Morales and Martinez-Fernandez (2004), we adapted the previous items to the institutions specific case and asked managers: a) if they considered the role played by local institutions and sectorial associations as strategically important; b) if their firm maintained stable, intense and beneficial relationships
with local institutions in key business areas. Once more, 5-point Likert scale was applied where 1: fully disagree and 5: fully agree. We aspired to improve the quality of our index by combining the answers obtained with an objective indicator such as the number of local institutions the firm belong to. Internal validity and consistency of the construct (named Institutional linkages) was checked. Results obtained achieved Cronbach’s alpha over 0.72, validating the aggregation of items in one variable.

**Governance**

To operationalize governance, we included a number of questions based on our literature review. As our purpose was to evaluate the extent to which power is asymmetrically distributed in inter-firm relationships, we asked entrepreneurs and managers to rate the formalization of inter-firm relationship and a) flexibility on quality control and quality requirements; b) flexibility in delivery terms; c) flexibility in the selection of suppliers and materials; d) amount and regularity of the orders. We used a 5-point Likert scale where 1: very low and 5: very high. As we would expect certain perception bias depending on firm’s position on the network (central versus non-central), two different variables were created for each type of company named Governance (Central) and Governance (non-central). Internal validity and consistency of the constructs was checked. Results obtained achieved Cronbach’s alpha 0.70 and 0.82 respectively, validating the aggregation of items.

**Control variables**

Given the cross-sectional nature of our research, the final step at this stage was to establish the control variables to reduce concerns about potential endogeneity. On the one hand, we opted for Size measured as the average number of employees during the last three years. On the other hand, we also selected Export intensity during the last three years. This variable also provides us with some rough insights about the permeability of the cluster boundaries to non-local knowledge. Figure 1 presents the different variables and the hypotheses established with respect to our dependent variable.

**4.4 Statistical inference**

As in previous empirical research (for a recent example, Tokatli, 2007), the role of lead firms and supplier organizations was analyzed with respect to subcontracting operations. We assumed that lead firms should be large buyers in the selected clusters, with a strong market position, good reputation within the footwear industry and proximity to final customers. Mann-Whitney U test confirmed the differences expected in size and export intensity (p-value<0.01) between the two groups.

In line with this conceptualization, 57.6% of the manufacturers interviewed could be considered as lead firms, while the remaining units were ascribed to the suppliers group. The average number of business areas in which subcontracting operations existed was 2 of a maximum of 4. Most of the activities subcontracted were not high-value-adding, 93.4% of the units externalized manufacturing

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9 The four areas were: a) product design and development, b) cutting and stitching, d) assembly and finishing, d) marketing and logistics.
processes, compared to the 29.7% of the firms that externalized knowledge intensive operations. Generally speaking, the size and geographical location of the sample reflected the structure of the Spanish footwear industry, with most of the firms belonging to the Vinalopó cluster (59.1%) and predominance of sme’s (16.7 employees on average).

Regression model was applied to evaluate the contribution of each independent variable (representing firm’s innovative efforts, vertical relationships, governance, institutions, size and export intensity) to knowledge transfers. Correlation matrix was used to detect large correlations between pairs of explanatory variables (see Table 1). Partial correlations did not reach values over 0.8; consequently, we had no concerns about multicollinearity. The equation model was expressed as follows:

\[
\text{Knowledge Transfers}_i = \text{constant} + \beta_1 \text{Internal efforts}_i + \beta_2 \text{Vertical relationships}_i + \beta_3 \text{Institutional linkages}_i + \beta_4 \text{Export intensity}_i + \beta_5 \text{Size}_i + \beta_6 \text{Governance-C}_i + \beta_8 \text{Governance-NC}_i
\]

Table 2 presents the regression models. The first model only reflects the effects of internal efforts (firm’s resources), local relationships (relational resources) and the control variables on knowledge transfers. The second model also controls for the role of governance on knowledge transfers. The models were estimated using the minimum number of superfluous (non-significant) variables. F-tests conducted show that both linear regressions are significant at the 1% level. Our result evidence that internal and relational resources have predictive power over knowledge transfers among crucial partners. It should be mentioned that adjusted \( R^2 \) values are moderated (0.236 and 0.255, respectively), but most of the coefficients are significant. Additionally, the explanatory power of the model rises by 8.1% when the initial set of variables is augmented with the governance specific set. So, it seems that the explanatory power is partly driven by the governance variables.

The first hypothesis on the basis of models 1 and 2 is confirmed, predicting that internal resources were positively associated with knowledge transfers among crucial partners. The variable used to test this hypothesis (\textit{Internal effort}) presented a positive and statistically significant effect on Model 1 and Model 2 (\( p<0.05 \)). Such an outcome provides strong support for our assumption, and \( \textbf{H1} \) was accepted. Furthermore, \( \textbf{H2} \) suggested that intra-cluster relationships were negatively associated with the knowledge transfers among crucial partners. In fact, the \textit{Vertical relationships} variable was negatively and significantly associated with knowledge transfers at \( p<0.01 \) in both models. These results provide robust support for \( \textbf{H2} \); consequently, the proposition was confirmed.

Next, the governance effect (\( \textbf{H3} \)) was included in model 2, and for this specific purpose a couple of variables were added to the initial configuration. The governance effect was tested using the perception about the governance structure
exhibited by crucial partners that are customers or suppliers. As it was previously mentioned, we opted for this operativization in order to minimize any potential perception bias. The model was run with all the internal and relational variables, the control variables plus the two governance variables. In the linear regression, the statistically significant negative influence of Governance-C (perception from customers) at p<0.1 showed how rigid and power driven governance structures facilitates knowledge transfers among crucial partners. Therefore, H3a was confirmed. Conversely, the positive coefficient achieved by Governance-NC (perception from suppliers) did not reach any statistical significance (H3b). Therefore, we only find partial support for H3.

The Institutions variable (Institutions relationships) was also statistically significant at p<0.05 (Model 1) and p<0.1 (Model 2), indicating a positive effect on knowledge transfers among partners. Furthermore, the Size variable was not statistically relevant, while the Export intensity was highly significant in all models (p<0.01). This result provides rough insights about firm’s access to non-local sources of knowledge. The positive sign leads us to speculate that the more internationalized the firms are, the more knowledge transfers among partners exist.

4.5 Discussion

Firm’s internal resources and knowledge transfers
It is apparent from the confirmed H1 that when partners present strong knowledge bases, inter-firm relationships are more likely to be characterized by high exchanges of design, marketing or technology. As knowledge transfers can take place in both directions, this result endorses the premise that actors involved in knowledge transfers must have something worthwhile to offer, but also the internal resources to recognize the potential value of knowledge shared (Easterby-Smith et al., 2008). For instance, relevant information about fashion trends, product forms, designs or colours can flow from customer to suppliers (and vice versa). Consequently, actors need the capacity to absorb this key information, and apply it in successful product lines. Several expertises interviewed in the preliminary stage of our research, indicated that past experiences or human resources contribute to the development of this absorptive capacity.

This outcome is also in line with Saliola and Zanfei (2009) who indicated that the capacity “to handle the technology” is linked to transfers of value added activities. Consequently, footwear lead firms characterized by sophisticated products, advanced organizational systems or important marketing activities are more open to share knowledge with their crucial partners in order to maintain their privileged position. Taking into account our qualitative evidences, we may assert that these transfers allow lead firms to partially or entirely shift sophisticated activities to skilful suppliers, permitting significant cost reductions and reorientation of resources. Usually, expert partners assume the convenience of transferring knowledge in order to maintain their privileged relationship with the lead firm.

Intra-cluster relationships and knowledge transfers
Results obtained are in line with the new research trend that rejects the uniform positive impact of inter-firm relationships on many aspects of firm's performance. Grounded in sociological and relational perspective, the most extended view signals the key role of the distinct inter-organizational and institutional relationships in which firm is embedded. Information, knowledge and resources flow through dense and tight relationships characterized by mutual confidence and trust. However, the acceptance of H2 leads us to suggest that dense relationships in clusters may not be systematically beneficial for the firms. It seems that the particularities of the firm's relationships portfolio can shape the actor's knowledge transfers in different ways (Lin, 2001).

Generally speaking, local firms have ties to an alter that can lend resources and valuable information essential to innovate. However, when footwear units enjoy a preferential business relationship, tight linkages with other local suppliers and customers may harm knowledge flows among crucial partners. Expert interviews provide us some insights to explain why both leaders and expert suppliers may become reluctant to transfer knowledge if their partners are excessively embedded in intra-cluster relationships: a) lead firms can be concerned about the diffusion of valuable knowledge (management practices, new product launches, design developments or fashion trends) through the pervasive local interactions of their skilful suppliers; b) leaders' contacts with other local actors (particularly suppliers) may generate uncertainty and even destabilize their main business relationship; c) cultivating many local relationships demands time, resources and efforts that can be detracted from main partnership, diminish the attention devoted to the main partner.

**Governance and knowledge transfers**

Two different scenarios arise when discussing results on H3: the perspective of the lead firms (H3a) and the skilful suppliers (H3b). Consistently with our hypothesis, it thus appears that if leaders feel themselves involved in a quite flexible relationship with their crucial suppliers, intensive knowledge transfers are less likely to occur. The negative impact of Governance-C can be interpreted as a signal that the capacity of leaders to control the suppliers' behaviours emerges as a relevant issue. Knowledge transfers from lead firms require governance modes through which leaders feel secure from opportunistic behaviours by their partner due to their powerful position. Lead firms will only be induced to share knowledge related to core business activities when any suppliers’ upgrading processes cannot challenge their competitive position. Therefore, up to this point, knowledge transfers require hierarchical forms of governance and the necessary power asymmetries.

Contrary to what we expected, Governance-NC showed positive insignificant influence on knowledge transfers. The sign obtained probably suggest that even relationships lead to higher knowledge transfers from the suppliers’ perspective. Although particular caution is needed when discussing this outcome, we may speculate and say that it has to do with the relative weakness of these traditional intra-cluster networks. Mutual dependence and reciprocity are at the base of dense local relationships. However, the more control lead firms exert control over their suppliers, the less interdependent partners are likely to feel. Consistently, sme’s become progressively reluctant to transfer knowledge; although, they cannot
neglect their status of fragility and are forced to assume the risk and benefits of sharing valuable information.

Local institutions and Knowledge transfers
We also explored the role of local institution on knowledge transfers among lead firms and partners. Results endorse the relevance of these actors in knowledge flows dynamics. The agglomeration of firms boosts a range of institutions that facilitate technological upgrades, providing advanced services, or enhance innovation activities, acting as gatekeepers of knowledge (Morrison, 2008). However, in the light of both the theoretical literature and the results of this paper, perhaps these perspectives are insufficient in explaining differences in knowledge transfers, and other institutional roles may provide relevant clues.

Considering Coleman (1988), social capital refers to the elements such as trust, common norms, habits or rules that glue the different local actors, facilitating knowledge circulation at the cluster level. In advanced stages of cluster evolution, the resultant dense collaborative networks emerge as a pre-requisite for successful exchanges and collective actions (Maskell and Malmberg, 2007; Menzel and Fornahl, 2010). Meetings and joint projects mediated through cluster institutions bring multiple local actors together, contributing to the reinforcement of shared values and the trustful atmosphere necessary for interfirm knowledge transfers. Consequently, the positive coefficient exhibited by this variable reveals the extent to which cluster's institutions enhance knowledge transfers and innovativeness.

5. CONCLUSION, LIMITATIONS AND POLICY IMPLICATIONS
Questions about the negative effects and constraining nature of certain network ties, the growing weight of lead firms in clusters and the implications in terms of governance for knowledge transfers, clearly emerge salient in analyses of cluster transformation and innovation. In light of the findings from this study of the footwear clusters in Spain, several important implications have appeared related to these mentioned questions. We suggest that knowledge transfers between crucial partners are the result of the interaction between firms' internal resources, intra-cluster linkages and local institutions. Some purely intra-cluster factors help to explain the knowledge transfers dynamics. In this vein, local institutions (universities, research centers and business associations) still provide the glue to local inter-firm relationships and favors knowledge transfers between partners. So, our findings legitimate crucial partners as targets for public actions. Public policies should not only include the provision of advanced technical services or the local-global mediating role, but also contemplate programs that improve knowledge transfers between crucial partners. Interventions need to go beyond merely promoting matches, and have to be underpinned by principles like consolidating the proper atmosphere, considering governance or evaluating partners’ capabilities.

The analysis supports the claim that dense local networks are not always positive “per se” related to knowledge transfers between lead firms and partners. In fact, negative collateral consequences are likely to emerge when norms for appropriate business behavior become weak and doubts about partners trustworthiness appears. This may cause uncertainty about loyalty, and a lot of frustration
Consequently, managers should be aware that if the cooperative atmosphere is not stable, there might be a need for strengthening norms, values and communication channels essential for a fluent and effective interaction between partners.

Additionally, skillful suppliers may be locked-out from their traditional local networks by their lead firm because of demands for concessions and the underlying business dependency. From this fact, the implication is evident: once the supplying organization is nearly isolated in the cluster, its innovation performance progressively declines as the well-known stream of the social capital and networks approach emphasizes. In many ways, this interesting result is close to recent literature that clearly warns against assigning purely beneficial effects to intra-cluster linkages.

In the footwear industry, no firms can perform the activities of all the parts of the value chain. This evidence raises the relevance of high quality exchanges of knowledge for firms’ survival and growth. Traditionally, poor absorptive capacity of the recipient and unwillingness of donor to share profitable knowledge have been recognized as powerful inhibitor factors of transfers (Argote, 1999). The simultaneous need for technological strengths and absorptive capacity in both donor and recipient is another insight provided by our research. Intensive knowledge transfers are more likely to occur when both partners possess the necessary business experience and technological capabilities to make them happen and make the two sides “win”. This valuable finding is slightly different to what could be expected from the Global Value Chain literature or Argote (1999).

In mature clusters, many suppliers and lead firms possibly act as donor and recipients of valuable flows. On one hand, skilful suppliers can acquire higher managerial, organizational, market or product development knowledge in aspects such as fashion trends, mass global markets, off-shoring activities or logistics. But, the poor absorptive capacity of the supplying organization can impede “successful” knowledge transfers. On the other hand, due to their product design and technological capabilities, skilful suppliers may also transfer valuable information to lead firms. Release of Knowledge from lead firms or multinationals towards suppliers has been widely documented in the academic literature. However, it must be highlighted how, in industrialized clusters, lead firms with proper absorptive capacity can also benefit from the knowledge transferred by their skilful suppliers.

In advanced stages of the cluster life cycle, previous internal efforts and interactions at both local and non-local level consolidate supplier’s knowledge base, permitting information flows towards the lead company and reinforcing its knowledge base. The key issue is that both lead firms’ and supplier organizations’ internal resources are key factors to explain inter-firm knowledge transfers, and subsequently the innovation capacity of the collective action. Both leader’s and supplier’s internal resources not only allow the emission of information flows, but also determine how partner’s resources are accessed, exploited and combined. Additionally, complementarities between partners’ resources encourage information flows and reinforce the synergies achieved by the both actors.
Considering that cluster literature has largely ignored the notion of power, our findings highlight some valuable contributions related to the governance structure and power asymmetries between partners. The more hierarchical and asymmetric the relationship is, the greater the knowledge transfers from the lead firm will be.

As concerns about supplier’s business behavior arise, lead firm uses its dominant position to ensure that the knowledge transferred is not implemented or diffused in an opportunistic manner. In other words, the emergence of lead firms propels less balanced relationships; due to leaders expect to capture all the benefits derived from the information flows and their applications. Conversely, the supplier’s perspective does not mirror process, as more asymmetrical relationships probably moderate the cooperation intensity. The corollary is immediate, traditional “Marshallian” configurations may be deteriorated as more hierarchical governance structures materialize. In any case, this evidence, to some extent, probably underlies the progressive emergence of Hub-and-Scope structures in well-known “Marshallian” clusters. Although, future research need to further scrutinize and corroborate this line of reasoning.

This study is not exempt of some limitations. Throughout the present research, we used data from the Spanish footwear industry. Hence our findings remain restricted in their generality. Obviously, the investigation should be extended to include more industries. The indexes applied can be improved. More sophisticated measures should be considered in subsequent enquiries. Finally, the explanatory power of the models is relatively moderate. Future research should pay special attention also to the non-local inter-organizational linkages.

References


**Figure 1:** Variables and hypotheses

**Table 1:** Correlation matrix

<table>
<thead>
<tr>
<th></th>
<th>Innovation effort</th>
<th>Vertical relationships</th>
<th>Governance-C</th>
<th>Governance-NC</th>
<th>Institutions relationship</th>
<th>Export intensity</th>
<th>Size</th>
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Significance level ***0.01; **0.05; *0.1

**Table 2:** Regression analysis
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Significance level ***0.01; **0.05; *0.1