The impact of cluster governance in the upgrading of territorial value chains

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Résumé :

Clustering and participating to a (territorial or global) value chain are increasingly considered as major strategies to enhance firms' competitiveness and sustainability. Both cluster and value chain approaches emphasize the role of cluster governance in fostering innovation, upgrading and sustainability as en essential complement to transaction costs and incidental synergies arising from agglomeration. Nevertheless, recent contributions have stressed that more attention needs to be paid to the concrete governance practices that facilitate the emergence of a specific institutional environment conducive to enhanced collaboration for innovation and upgrading.

In this study, we contribute to this debate developing an integrative framework of 8 sets of institutional practices of innovation grouped around three main levers – political, normative and cognitive. Based on a comparative case study of three French clusters of innovation – one technopole and two recent competitiveness clusters – we find that 1) each cluster governances activates all institutional levers and practices but with a high variation of intensity, and that 2) these variations of intensity match the upgrading at the cluster level. Moreover, the implementation of the political, normative and cognitive levers leads to the emergence of three new variables, namely the cluster's legitimacy, the institutional trust and the architectural knowledge, that favor the building of a sustainable territorial value chain.

Mots-clés : Cluster governance; Institutional work; Territorial value chain; Institutional practices of innovation; Innovation

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INTRODUCTION

The aim of this paper is to explore how institutional practices of cluster governance may promote and foster innovation and sustainable territorial value chains. Worldwide, scholars and policy makers are increasingly considering clustering and participating to a (global) value chain as possible strategies to enhance firms' competitiveness (Giuliani *et al.*, 2005). In line with these considerations, the French industrial policy has led to the creation and support of regional clusters of innovation: first, in the 1980s, the development of technopoles and, more recently, in 2005, the creation of "competitiveness clusters" ("Pôles de compétitivité"). Stemming from top-down national and regional politics, technopoles and competitiveness clusters both address the same main objective of fostering collaborative innovation through the geographic concentration of enterprises, large and small, higher education hubs and public or private research units, all engaged in a partnership so as to create synergies (Brette et Chappoz, 2007; Porter, 1998).

Since 2012, the French competitiveness clusters have entered a new development phase aimed at the creation of value at the individual (firm) as well as territorial level (regional wealth and employment). The aim is to develop a sustainable value chain at the territorial level with global implications. The cluster's sustainability, the internationalization of the firms and the international opening of the cluster are indeed strong concerns for policy makers as major competitiveness tools for the cluster and the clustered firms (Chiarvesio *et al.*, 2010; Giuliani *et al.*, 2005; Sturgeon *et al.*, 2008; Vurro *et al.*, 2009). Innovation clusters might be the key interface between local production systems and the global economy (Chiarvesio *et al.*, 2010). The global value chain (GVC) literature points out the necessary and obvious links between the local scale of the cluster and the global one of GVC, in particular for the innovation and the development and transmission of tacit as well as codified knowledge (Bathelt *et al.*, 2004; Sturgeon *et al.*, 2008).

In this paper, we will not discuss the relationships between local and global players but we will rather dwell on the concept of "*upgrading*" relevant to both the cluster and GVC

theoretical strands. Following Giuliani *et al.* (2005: 550) "*upgrading refers to the capacity of a firm to innovate to increase the value added of its products and processes*". In this upgrading process both cluster and GVC literatures point out the role of *cluster governance* (Gereffi *et al.*, 2005; Giuliani *et al.*, 2005; Humphrey et Schmitz, 2002; Pietrobelli et Rabellotti, 2011). Cluster governance, broadly defined as a steering and managing structure that coordinate economic activities within the cluster through non-market relationships, is aimed at fostering upgrading (innovation) and competitiveness as an essential complement to transaction costs and incidental synergies arising from agglomeration (De Propris et Wei, 2007; Giuliani *et al.*, 2005; Humphrey et Schmitz, 2002). The importance of cluster governance for the upgrading process of the cluster is mainly linked to 1) the growing complexity of information and knowledge transfer, 2) the ability to codify this knowledge and transmit it efficiently between clustered members and outside members, and 3) the capabilities of cluster firms to upgrade their local competencies and enlarge their knowledge base (absorptive capacity - ACAP) in order to benefit from opportunities of the global economy (Chiarvesio *et al.*, 2010; Gereffi *et al.*, 2005; Hervas- Oliver *et al.*, 2008).

From an analytical point of view, the value chain approach is useful because it focuses on the nature of the relationships among the various actors involved in the chain, within and outside the cluster (Giuliani *et al.*, 2005). To study these relationships, the concept of governance is central (Gereffi *et al.*, 2005; Giuliani *et al.*, 2005; Humphrey et Schmitz, 2002). However, these authors only rely on modes or types of governance (market, network, quasi-hierarchy and hierarchy) and do not pay enough attention neither to the institutional context within which local firms interact (Pietrobelli et Rabellotti, 2011) nor to the concrete practices aimed at developing a specific institutional environment conducive to upgrading, innovation and sustainability at the cluster level (Bell *et al.*, 2009; Lawrence *et al.*, 2009). Therefore, our research question is the following: *what are the institutional practices that cluster governance can develop and implement to foster an appropriate organizational and institutional environment conducive to a sustainable territorial value chain?*

In order to answer this question we build on several schools of thoughts: the neo-institutional approach, precisely the concept of institutional work (Lawrence et Suddaby, 2006), the innovation and the cluster governance literatures. We develop an integrative framework that eases the identification of institutional innovation practices implemented by the cluster governance. We then use empirical evidence from a comparative case study of three French

clusters of innovation: one technopole, Savoie Technolac, and two competitiveness clusters, Imaginove and Axelera, all located in the Rhône-Alpes region. Drawing on a qualitative analysis, this study compares the way cluster governance implements institutional practices of innovation and analyses their impact on the cluster upgrading and sustainability.

After this introduction, Section 2 presents a literature review on cluster governance and institutional work and builds a conceptual framework to understand institutional dynamics of cluster governance. Section 3 describes the three clusters and explains the methodology used to collect and analyse the data. Section 4 presents the main results. The final section discusses the most important conclusions and contributions of the study followed by the limitations and future research directions.

1. CONCEPTUAL FRAMEWORK

Clusters are "*geographic concentrations of interconnected companies and associated institutions in a particular field*" (Porter, 1998: 78). This definition emphasizes two important dimensions for cluster governance: first, the *network* dimension and second, the geographic or more precisely the *territorial* dimension. A third dimension, the *knowledge management*, is highlighted by the emergent knowledge-based view of clusters – KBVC (Maskell, 2001) which conceptualizes clusters as "*venues of enhanced knowledge creation*" (Arikan, 2009: 658).

1.1. CLUSTER GOVERNANCE

Cluster governance is a relatively new and rich concept. The term of governance first appeared in the economic discourse in the 90s, mostly with regard to corporations' internal distribution of power (Jessop, 1998). For Gereffi (1994), governance is defined as "authority and power relationships that determine how financial, material and human resources are allocated and flow within a chain" (*ibid*: 97). It offers a hierarchical view of the coordination of actors' interrelations: governance being the means by which order is restored, conflicts regulated and mutual gains realized (Williamson, 1996). In public management, governance refers to the funding and oversight roles of government agencies (Hill et Lynn, 2005). The critical role of governance, for private as for public management, is to monitor and control the behavior of management (Provan et Kenis, 2007).

Progressively a parallel literature has developed on network governance, in order to take into account the complexity and heterogeneity of independent actors interrelating within the network (De Propris et Wei, 2007; Jones *et al.*, 1997). Provan et Kenis (2007) consider that "*a focus on network governance involves the use of institutions and structures of authority and collaboration to allocate resources and to coordinate and control joint action across the network as a whole*" (*ibid*. : 231). Analyzing regional cluster organization, Bell *et al.* (2009) distinguish two different types of governance: relational and hierarchical. Relational governance refers to inter-organizational decision-making based on relational norms like implicit understandings, trust relations, common knowledge binding together actors of the cluster. On the other hand, hierarchical governance relies on explicit patterns of authority that allocate decision rights between transacting partners.

In the specific context of French clusters of innovation characterized by a top-down development policy and a strong implication of the State and the regions (Brette et Chappoz, 2007), we also need to take into account a third stream of literature on territorial governance. Territorial governance can be seen as "*a complex institutional process combining cognitive and political dimensions, in which institutional proximity appears as a precondition of collective action and so organizational proximity at the micro-level of coordination*" (Carrincazeaux *et al*., 2008: 624). This definition of territorial governance encompasses two dimensions. First, an *institutional dimension* that builds effective communication and collaboration through shared values and representations between actors. Second, an *organizational dimension* that emphasizes coordination as well as control and regulation of the co-located actors (Ben Letaifa et Rabeau, 2013).

Following this brief review of literature, we can define cluster governance along three distinct roles: 1) a control and regulative role, 2) a coordination role, and 3) a strategic role in developing cognitive resources and knowledge for cluster members (Alberti, 2001). For the KBVC (Arikan, 2009; Bahlmann et Huysman, 2008; Maskell, 2001), learning and knowledge exchanges between cluster's organizations constitute the main strategic asset of the cluster and innovation its key process. Primary emphasis is placed on innovation and interfirm knowledge exchanges among cluster firms. The complexity and heterogeneity of actors in French clusters – institutional players, large and small firms, private and public research units, education – make knowledge management within the cluster much more complex than it is within a corporate context (Corno *et al.*, 1999). Creating and exploiting flows of knowledge

for the benefit of the cluster lay beyond the responsibility of a single player like one of the leading firms in the cluster. The governance structure can thus play the role of "*social architect*" (Corno *et al.*, 1999), monitoring the flow of knowledge and enabling favorable conditions for knowledge creation processes as well as knowledge transfer and diffusion (Humphrey et Schmitz, 2002; Sturgeon *et al.*, 2008).

Thus, emerging from those different strands of literatures, we can highlight three important and complementary aspects of cluster governance: governance as a *coordination mode*, governance as a *regulation and control mode* and governance as a *knowledge management device*.

However not all clusters do exhibit the same successful rate at enhancing firms' knowledge creation efforts. For Arikan (2009), the main solution to these failures is for the cluster governance to develop an appropriate institutional environment that will (re)establish cooperation norms and develop or rebuild trust relationships. Following this line, we concentrated our attention on the emergent theoretical framework on "*institutional work*" developed by Lawrence and Suddaby (2006) , in order to understand **how** precisely could the cluster governance create an appropriate institutional environment to foster knowledge exchanges, innovation and therefore upgrading and sustainability of the cluster.

1.2. INSTITUTIONAL WORK AND PRACTICES

The concept of institutional work describes "*the purposive action of individuals and organizations aimed at creating, maintaining and disrupting institutions*" (Lawrence & Suddaby, 2006: 215). Extending work on institutional entrepreneurship, institutional change and innovation, Lawrence and Suddaby shift the analysis to the practical actions through which institutions are created, maintained and disrupted. Focus is made on how intentional actions and actors affect institutions and what kind of concrete practices are employed in relation to institutions, instead of focusing on institutions as templates for action (Lawrence *et al.*, 2009).

For our study on cluster governance, institutional work provides an interesting framework to identify the concrete practices implemented by collective actors within the governance structure. Departing from the "heroic" dimension of one institutional entrepreneur (DiMaggio, 1988), this approach highlights the strategies and concrete practices of many actors organized

in "*a highly structured and hierarchical manner*" (Lawrence & Suddaby, 2006: 247) and their influence on the creation of a new institutional environment.

In their seminal article, Lawrence and Suddaby (2006) observed 9 distinct sets of practices through which organizational actors engaged in actions that resulted in the creation of new institutions. These sets of practices reflect three broader categories of activities:

- **Political** work: "vesting", "defining" and "advocacy" reflect political work in which actors reconstruct rules, property rights and boundaries that define access to material resources. The political lever is key to creating institutions insofar as its associated practices have the ability to establish rules, and construct rewards and sanctions that enforce those rules.
- **Normative** work: "constructing identities", "changing norms" and "constructing networks" emphasize actions in which actors' belief systems are reconfigured. The normative lever is the most "cooperative" of the three approaches. Firms share the same institutional structure and develop similar language, technology attitudes and interpretative schemes (Bathelt *et al.*, 2004): they "are bound together through day-to-day interaction, based on the same expertise, a common set of technological knowledge and similar experience with a particular set of problem-solving techniques" (*ibid.*: 39).
- **Cognitive** work: "mimicry", "theorizing" and "educating" involve actions designed to alter abstract categorizations in which the boundaries of meaning systems are altered. Well-established actors in the organizational field, with sufficient resources and legitimacy, will provide actions' templates and specific training for actors to facilitate the adoption of the new institutional practices.

Although the framework on institutional work seems particularly pertinent for the identification and analysis of concrete practices aimed at creating a new and appropriate institutional environment, it does not take into account the specific innovative and inter-organizational context of clusters nor the role of collective actors organized within a cluster governance structure. In the next section we propose an integrated framework considering all specificities related to innovation, cluster and governance.

1.3. AN INTEGRATED FRAMEWORK FOR INSTITUTIONAL PRACTICES OF CLUSTER GOVERNANCE

Our literature review on cluster governance emphasized three main aspects of cluster governance that complement each other: 1) a coordination function, 2) a regulative and controlling function, and 3) a knowledge management (KM) function. These three functions match the three main levers of institutional work, respectively 1) normative lever for the coordination, 2) political lever for the regulation, and 3) cognitive lever for KM.

Matching literature on innovation, cluster governance and institutional work and translating it to the specific inter-organizational context of clusters lead us to the following analysis grid of institutional practices of cluster governance. Unlike the original framework of Lawrence et Suddaby (2006), we suggest to study the three levers together and to match them with the three functions of cluster governance. Our framework identifies then 8 sets of institutional practices associated to the 3 levers. For each set or form of institutional practices, we develop several associated institutional practices that cluster governance might implement to create a specific institutional environment conducive to enhanced innovation.

- **Political practices** foster firms' innovation within a cluster by facilitating the acquisition and allocation of financial or material resources and by establishing rules and constructing rewards and sanctions that enforce those rules and reduce free-rider risks.
  - *Advocacy practices* guarantee political support for the attraction and allocation of opportunities and material resources, both financial and human, to foster firms' innovation.
  - *Defining constitutive rules* facilitate the cohesion of very heterogeneous actors by clearly defining the regulative cooperation framework and legitimizing the cluster as "an acceptable form of organizing" (Human & Provan, 2000: 337), both to cluster members and to external groups, such as funders. These practices participate to the creation of an organizational proximity between cluster members.
  - *Regulative mechanisms* are more constrictive, regulative and coercive than both other sets of political practices. These practices aim at limiting opportunism risks for cluster partners engaged in collaborative innovation projects.
- **Normative practices** are aimed at creating both organizational and institutional proximities that link cluster members together and promote innovation. By constructing

shared identities and normative networks, normative practices facilitate the development of stable interactions and create relations of trust that promote greater access to and exchange of knowledge within cluster organizations and generate dynamics of innovation (Eisingerich *et al.*, 2010).

- *Identity building* corresponds to two main practices: 1) the formulation of a strategy of its own that will be clearly communicated to all cluster members, and 2) the development of communities bearing this strategy (Nonaka et Konno, 1998).
- *Constructing normative network* helps regulate and promote interactions for innovation. The development of collaborative projects of innovation through networking actions, thematic working groups, call for projects or collaborative incentive schemes, and the integration of the scientific community are two other sets of normative practices facilitating the building of a normative network.

• Cluster governance relies on the **cognitive lever** to manage knowledge creation at the cluster inter-organizational level. Cluster members have to share a common knowledge background – technical as well as generic – broad enough to develop collaborative innovation projects (Boschma, 2005).

- *Mimicry practices* rely on the concept of institutional isomorphism (DiMaggio et Powell, 1983) that explains why, in the same institutional environment, organizations tend to adopt identical structure and behavior. In the cluster context, mimicry practices facilitate the adoption of collaborative practices for innovation and have them accepted by cluster members as "taken-for granted".
- *Knowledge management practices* are based on three main phases following the model of knowledge integration of Kraaijenbrink and Wijnhoven (2009): knowledge identification, knowledge acquisition and knowledge use. At the cluster level, the specificity of knowledge management practices is that they aim at developing architectural knowledge or cluster core competences. The shared knowledge basis enables cluster firms to produce new knowledge and innovations (Bathelt *et al.*, 2004).
- *Enhancing absorptive capacities* is the last set of cognitive institutional practices of innovation. Educating focuses on training actors to acquire key skills and competences, and to improve their knowledge absorption capacity (ACAP). Cluster governance plays a double role in enhancing ACAP. First, it makes the knowledge available (through identification practices) and second, it ensures that companies in the cluster, and SMEs in

particular, have the ability to appropriate them. At the cluster level, the development of the ACAP is at stake as it facilitates a faster assimilation and transfer of the knowledge amongst cluster firms: the increase of the knowledge stock owned by the cluster will thus define a competitive advantage for the firms (Hervas-Oliver *et al.*, 2009).

Our conceptual framework with its associated institutional practices of innovation for the cluster governance is summarized in appendix 1.

2. METHODOLOGY

This empirical research is based on a comparative study using qualitative data of three French clusters of innovation.

2.1. THE CASE STUDIES

For this study, we concentrate our analysis on a technopole, Savoie Technolac, and two competitiveness clusters, Axelera and Imaginove, the three of them located in the Rhône-Alpes region. First French industrial region and 5th European region for its technological and scientific potential, the Rhône-Alpes region is also particularly interesting for its high concentration of clusters, 2nd rank after Paris region.

The three clusters share similar characteristics in terms of size (between 150 and 180 firms) and nature of members (a majority of SMEs and of micro-businesses for Imaginove and Savoie Technolac). They differ in terms of industrial activities and governance structure. The table 1 hereafter summarizes the main characteristics related to their emerging context, their industrial and governance characteristics.

SAVOIE TECHNOLAC	**Emerging context**	Created *ex nihilo* in 1987, in Savoie, from a regional political will of developing the territory in order to relaunch the economics. Based on the popular model of the Silicon Valley and developed in a beautiful natural environment (lake, mountains and green).
	Structural characteristics End 2010	180 firms, 21 research centers, 9 academic establishments, 98% SME (66% < 10 employees). 4 industries: 1) ITC, 2) Conception & manufacturing of industrial equipment, 3) New materials and 4) Solar and renewable energies.
	Governance characteristics	Strategic governance: a joint union, SYPARTEC, with 21 delegates of the 3 territorial collectivities behind the project. Operational governance: 13 people organized in 3 departments: innovation, startups and international.

IMAGINOVE	**Emerging context**	Competitiveness cluster created in 2005. Project first led by the video game industry in Rhône-Alpes. 2006: cluster reorganization over the « Moving Picture» industries under financial pressure of the territorial collectivities (Grand Lyon and region).
	Structural characteristics End 2010	134 firms, 6 research centers, 15 education institutions. 99,5% SME (65% < 10 employees). 3 main industries: 1) Multimedia, 2) Video game and 3) Cinema Majority of actors located in Lyon + Grenoble, Annecy et Valence.
	Governance characteristics	Strategic governance: a board of 10 people in 5 colleges (industrials 6/10 seats) + Scientific committee 10 people. Operational governance: 7 people + director
AXELERA	**Emerging context**	Competitiveness cluster created in 2005. Strong influence of two institutions (Grand Lyon and Rhône-Alpes region) on the initial project of joining 2 industries: chemical industry and environment. Project led by 5 organizations, leaders of their industry: 3 industrials (Arkema, GFD Suez & Rhodia) and research centers (IFP EN & CNRS)
	Structural characteristics End 2010	169 firms, 55 research centers and 9 academic institutions. 57% SME (37,5% < 10 employees); presence of very large firms. Strong progress of SME membership over the last years.
	Governance characteristics	Strategic governance: a managing board with the 5 founding members, a larger board of directors (22 members and 12 industrials), a scientific committee of 10 people. Operational governance: 12 people, 8 employees and 4 temporary detached personal of the funding organizations.

Table 1 - Case Studies Main Characteristics

2.2. DATA COLLECTION AND ANALYSIS

In-depth interview is the primary mode of the data collection, which was conducted between November 2010 and February 2011 on the three clusters. The main actors of both strategic governance (board members, scientific committees, directors) and operational governance (members of the animation team) were interviewed. A total of 24 semi-structured face-to-face interviews were conducted on the three clusters for an average of 1:20 minutes.

The interview guide is organized around three main themes: 1) the emerging context and the structural characteristics of the cluster, 2) the characteristics of its governance, and 3) the measures implemented by the governance to foster innovation. The interviews were all recorded and fully transcribed. To triangulate the data, we used many public or confidential

documentary sources (website, newspaper articles, internal policy documents) and non-participant observations.

Following Miles et Huberman (2003) methodology, data analysis was done in two main stages. We first performed a preliminary analysis of content from the three major themes in our interview guide and wrote a monograph for each of the three cases studied. This first step enabled the condensation and structuration of all data. A dictionary of themes was then created according to our analytical framework of institutional practices of innovation in order to facilitate the coding of primary and secondary data. We then conducted a second analysis, intra- and inter-case study, in order to precisely identify the different sets of institutional practices – political, normative and cognitive – that were implemented by the cluster governance to foster innovation at the firms' and cluster level.

3. RESULTS

The objective of this paper is to gain an insight into specific institutional practices and to evaluate their effects on the ability of cluster governance to develop social and institutional dynamics conducive to upgrading, innovation and sustainability at the cluster level. First results reveal that the three cluster governances activate all institutional levers – political, normative and cognitive. However, institutional practices of governance in our three clusters show very different degrees of engagement that seem to go hand in hand with innovative performance at the cluster level, as perceived through the qualitative analysis.

In terms of collaborative dynamics of innovation, our findings show the difficulties encountered by firms belonging to the same cluster to work together on collaborative projects of innovation. It highlights important differences in terms of inter-organizational cooperation for innovation within the cluster. To sum up, in our three clusters, internal cooperation should be encouraged and stimulated, which implies an appropriate institutional environment and the specific actions of cluster governance. We detail hereafter the implementation of the institutionalized practices of governance according to the three main levers of our integrated framework.

3.1. POLITICAL PRACTICES

In **Savoie Technolac,** cluster governance focused its actions on the institutional component of political practices, namely advocacy or suasion practices through a strong regional and

national lobbying for financial resources and the presence and action of two emblematic institutional figures: the chairman of the technopole, who is also senator and general councilor of Savoie, and his friend, the director of Grenoble subsidiary of the CEA, the French Alternative Energies and Atomic Energy Commission. Thanks to their political support, they managed to leverage important human and financial resources, including the location of the INES, the National Institute for Solar Energy, and two incubators on site.

Regarding the two other sets of political institutional practices – defining constitutive rules and regulative mechanisms – the governance of the technopole faces more difficulty to implement them. Rules of selection are quite fuzzy, innovation being the main criteria. The absence of rules of procedures impedes a precise definition of the roles and status of the different cluster members (firms, research labs, universities). Finally, regulative mechanisms are not considered as legitimate since the main stakeholders of the cluster, the cluster members are not part of cluster governance. Indeed, the choice of public governance, centralized and disconnected from firms concerns, hinders the acquisition of internal legitimacy (as "entity" according to the dimensions of the legitimacy of Human and Provan, 2000). It slows down the recognition of the technopole as a place conducive to the exchange of knowledge and innovative interactions. Thus, we can say that the deficit of political practices of innovation does not positively influence the dynamics of cooperation. Members of the technopole appropriate the technology park more like a venue and place of accommodation as a territory fostering collaboration for innovation and knowledge sharing.

The mobilization of political leverage is much stronger in **Axelera**, and fully impacts the three corresponding sets of institutional practices. Unlike the technopole, both competitiveness clusters, Axelera and Imaginove, chose a mixed mode of governance, with a larger private share since the participation of industrial firms is dominant in the steering board. Axelera adopts a fairly hierarchical and formalized governance structure that is focused around a central board – the “Bureau” – consisting of the 5 founding members. They play a pivotal role, promoting as well as enforcing their strategic vision of the cluster collective dynamics. Unlike many empirical examples of cluster governance, Axelera shows a very interesting model of governance structure developed around a close-knit group of public and private actors that manage to acquire a real internal as well as external legitimacy.

Mobilizing the political lever leads to the establishment of operational collective rules and facilitates a precise demarcation of the borders of the cluster as a meta–organization. Thus it enables the "taken-for-granted" acceptance of the cooperation framework and modus operandi of inter-organizational relations that are necessary conditions for the introduction of trust relationships and interactive learning amongst cluster members. Advocacy practices – in particular well-developed lobbying practices at a national as well as international level and the presence of powerful industrial key players – allowed, from the very creation of the cluster, the acquisition of substantial resources to support large-scale innovation projects. It gave an immediate high visibility to the cluster with ripple effect on its membership. The cluster has also been able to mobilize resources both human (many staff delegated by the founding organizations) and financial (funding a major benchmark study, launching of a consistent communication campaign). These resources quickly developed an image of a legitimate and essential partner for the development of innovation projects in the field of chemistry and environment.

Imaginove lies midway between the other two clusters. Advocacy practices are still poorly mobilized, particularly in lobbying. Unlike Axelera built around large organizations, leaders of their industry, or Savoie Technolac, with strong institutional and political support, the absence of leading companies in the field of motion picture and the strong diversity of actors, independent by nature, make it difficult to implement suasion practices to capture resources. The charismatic personality of the first director of Imaginove and a smaller strategic governance structure, representative of all cluster members, compensate partially the lack of political connections and capture resources.

The governance of Imaginove gradually lays the groundwork for the defining of constitutive rules. However, they are still largely informal and only start to draw up the guidelines for a general working framework for cluster members. The original intention of the cluster governance of converging the three sectors of the moving image results in a progressively finer selection of its members, thus encouraging cooperative behavior. To find additional drivers for enhancing collaborations and innovation, Imaginove governance proposed recently a device that helps leading companies to develop business on a larger scale, hoping that it will create a ripple effect on innovative collaborative projects. However, greater formalization seems desirable in the early stages of creating the cooperative framework in order to quickly

establish collective rules facilitating the establishment of an institutional innovation-oriented environment.

This first comparative analysis on the political lever shows that an increased formalization of the governance structure, highly depending on the active involvement of a group of actors and a coherent strategy across the cluster, improves the creation of common benchmarks and framework that should, in return, facilitate the adhesion of the cluster stakeholders and boost collaboration for innovation. However, the only political dimension may not be sufficient to create a sense of collective action. If political practices provide a framework that structures interaction of heterogeneous actors within the cluster and facilitates preferential access to resources for innovation, it is now necessary to examine the role of normative practices of innovation.

3.2. NORMATIVE PRACTICES

The recent identity building of **Savoie Technolac** around the solar and renewable energies facilitates the establishment of a common internal frame of reference and faster identification by external stakeholders. However, this retrospective identity building, driven by INES implementation and the geographic proximity of TENERRDIS competitiveness cluster, only concerns a small but rising proportion of firms in the technology park. It may cause cleavage between two "communities of entrepreneurs": those working in the solar and renewable energies sector, recently installed in Savoie Technolac, and the others, more numerous but also less prone to develop collaborative innovations. To avoid cleavage and facilitate the endorsement of all cluster members to the new identity, Savoie technolac governance needs to build a normative network that failed him yet. For the time being, Savoie Technolac has not succeeded in transforming informal relationships developed between long-established members of the technopole into professional interactions around collaborative innovation projects.

Developed only for CEOs of the technopole firms, the recent device "*Business Lunch*" aims at changing the level of interactions, from individual to organizational level. These meetings at lunchtime gather between 5 and 15 people every month and concern about 30% of cluster companies since its launch end 2009. Initially focused on the exchange of business best practices, the cluster governance observes now the emergence of a real network of business leaders. A second networking device was also launched end 2010: "*Solar meetings*", an

annual meeting around the solar business that eases the networking of technopole firms with key players of the solar industry and generates synergies with the INES. The objective is to develop a community around solar and renewable energies because the more innovative firms belonging to the same industry the more local collaboration and partnerships.

Since its creation, **Axelera** governance focused on the building of a clear identity, common to chemistry and environment. This shared identity facilitates adherence of both communities to the cluster and helps to federate them. There has been a significant effort on the part of cluster governance, to develop a coherent, sense-making strategy for both communities and to promote its dissemination. The strategy statement is clearly written in the first article of Axelera rules of procedure. As a matter of fact, Axelera not only develops a new identity for the cluster but also a new industry merging chemistry and environment. It is important that all stakeholders – cluster members as well as trade unions, professional associations, foreign partners, government – shall recognize and accept as legitimate the new industry.

Two key devices have been developed by the governance to form the basis of a community of companies: 1) "*Axelera Thursdays*" and 2) the development of *ecosystems*. Axelera Thursdays are networking events, approximately 10 per year: they allow members to meet and exchange through business speed meetings (5') and the following convivial networking cocktail. These sessions usually gather hundreds of people. The organization of innovation ecosystems also contributes to the formation of communities as participants meet regularly, especially in the initial phases, pre-projects, brainstorming. These ecosystems have been designed to operate independently in the long run such as "profit centers", even if they still are very linked to the cluster governance (referees and control of projects through annual follow-up). Formalization generated by these ecosystems provides a specific framework that clearly defines the respective roles of each member, thus facilitating the integration and collaboration of SMEs in collaborative innovation projects.

In order to build an identity shared by all cluster members, **Imaginove** first started to structure the relationships before entering a second phase of resources pooling. Like Savoie Technolac, the governance of Imaginove struggled to have the idea accepted by all members that synergies on collaborative innovation projects, especially between different industries, were necessary for the future of their industry. The structuring phase aimed at "creating a favorable atmosphere in the Rhône-Alpes region" to promote the development of SMEs from the

moving image industry, while the current phase of pooling is focused on creating conditions conducive to the emergence of a real normative network in which actors share collaborative values, including the setting up of joint cross-media oriented projects.

Nevertheless, inter-sectoral differences long outweigh convergence. At the start of the competitiveness cluster, much financial resources have been dedicated to the deployment of training programs and economic development assistance (programs Imaginove Commercial and Imaginove International). It slowed down communication efforts and implementation of specific devices to support innovative collaborations. The difference with Axelera is the lack of large or middle-sized companies, who play the role of "locomotive", both to bear and represent this new identity and thus involve SMEs in a system of shared representations where innovative cooperation are the norm. Yet the efforts of cluster governance are now beginning to bear fruit with the emergence of a real dynamic around cross-media activities driven by devices such as the Forum Blanc (annual conference on cross-media), the Living Lab (a usage laboratory), specific call for projects and a professional fair on Serious Games.

The comparative analysis highlights a stronger mobilization of normative practices by Axelera governance, notably the identity building that rapidly united cluster members on the new field of environmental chemistry. Savoie Technolac struggles in establishing a normative network but recent governance initiatives suggest a positive development, especially in the sector of solar and renewable energies. Finally, time for Imaginove should be a powerful ally in building a network whose foundations seem solid.

3.3. COGNITIVE PRACTICES

Beyond mimicry practices and dissemination of best practices, the cognitive lever is mainly based on knowledge management practices and the development of firms' absorptive capacity (ACAP).

Our results show, in general, a certain weakness of mimetic behavior, especially in **Savoie Technolac.** The technopole governance rarely communicates about collaborative innovation projects that are developed on site. It should help though to illustrate these case studies as best practices for other firms on the technopole. Nonetheless some "success stories" of innovative collaboration between technopoles partners have recently been posted on the website. The individualistic behavior of firms (very small services firms in majority) limits the scope of

networking activities offered by cluster governance and, therefore, a more widespread use of such devices.

Concerning mimicry practices, **Axelera** and **Imaginove** are in the opposite situation with members of the strategic governance strongly convinced of the benefits of collaboration for innovation. They even set an example by participating themselves to collaborative innovation projects. This is still not enough to gain the support of the remaining members. On the one hand, the ubiquity of the founding members of Axelera in the first collaborative projects, beyond the ripple effect, may have a chilling effect on smaller companies. On the other hand, the lack of "locomotives" in Imaginove able to enlist startups in collaborative projects slows the mimetic behavior.

As far as knowledge management is concerned, the three cluster governances engaged in the identification of new sources of knowledge. Due to the large majority of SMEs, **Savoie Technolac** and **Imaginove** first worked on the development of *generic* information tools, such as information or help given on entrepreneurship, innovation funding and protection, negotiation of consortium agreements, exploration of academic partners, HR management, recruitment, export or project management issues… They also disseminate more *technical* information like regular presentation of newly developed technologies by scientific partners, conferences or roundtables, on the solar for Savoie Technolac or on cross-media for Imaginove. Axelera even created a specific event, "*Technical Tuesdays*", to regularly discuss technical topics such as water in industrial process, intensification of extrusion processes…

The three clusters also developed many partnerships with other clusters, national or foreign, with public or semi-private institutions in charge the development of innovation (CRITT, THESAME, Economic Agency, Chambers of commerce) and with trade unions or professional associations. The objective of these partnerships is to provide member firms a widest possible range of external sources of knowledge to limit risks of cognitive lock-in.

Apart of the first set of knowledge management practices – identifying external knowledge – **Savoie Technolac** has not really developed the two other sets, namely the acquisition and the exploitation of common knowledge. Only the INES and its dedicated incubator deal with the creation and the transfer of cluster-specific shared knowledge. At the opposite, **Axelera** governance is heavily involved in the identification and acquisition of collective knowledge across the cluster. It quickly established 5 innovation ecosystems in relation to the strategic

themes identified for the cluster. These ecosystems support and accelerate the development of ideas, innovative projects and new knowledge. The exploitation of this new architectural knowledge is materialized in two projects: the creation of a platform for innovation, Axel'One, and of a research institute, INDEED, that should allow the implementation of knowledge created at the collective level, its formalization and development through spinoffs.

Imaginove governance is also strongly convinced of the importance of knowledge management practices at the cluster level. After the first phase of external knowledge identification, Imaginove implemented different ways to help cluster firms to develop and acquire shared knowledge, primarily focusing on cross-media and serious games: the organization of a professional fair, *Serious Game Expo*, two calls for collaborative projects on Serious Games and new consuming habits, a investment fund for cross-media and an annual conference, *Forum Blanc*.

The last set of cognitive practices concerns the ACAP of cluster firms and the way to enhance them for better innovative performance. These practices focus mainly on apprenticeship and learning. In **Savoie Technolac**, practices enhancing ACAP are oriented in two directions. First, the solar industry, with a major learning program, lifelong and initial training, managed by INES institute. Second, the startups, with the Base Academy, a specific training program for business developers. However, no other training programs are scheduled for the majority of cluster firms not belonging to these two categories, even if the geographical proximity of the university, Université de Savoie, might facilitate an easier access to education.

Axelera only started to develop an educational program for its members in the second development phase, i.e. from 2008. This program is mainly for SMEs with training for innovation, European collective projects, export… The governance also worked together with member universities to develop new, adapted educational program (5 new initial training on chemistry-environment sector). An *ad hoc* working group was set up to discuss questions relative to education, forward planning and skills.

Since the beginning of **Imaginove**, the training and human resource component is very important and materializes with the recruitment in the governance structure of a project leader for Training & Employment, who is in charge of coordinating the network of schools of image in Rhône-Alpes. Four targeted training programs were developed: Imaginove Commercial, Imaginove International, Imaginove Development and "Going for Growth".

Eventually, the cluster governance manages a skills management program that aims at defining common standards for cross-media players and stimulating inter-sectorial collaborative projects.

To sum up the results, the table 2 hereunder gives a comparative overview of the intensity level of use of the institutionalized practices of innovation.

LEVER	INSTITUTIONAL INNOVATION PRACTICES	SAVOIE TECHNOLAC	AXELERA	IMAGINOVE
Political	Suasion practices	++	+++	+
	Defining constitutive rules	-	++	+
	Regulative mechanisms	-	++	+
	Intensity degree of political level	+	+++	+
Normative	Identity Building	++	+++	+
	Constructing normative network	-	++	+
	Intensity degree of normative level	+	++	+
Cognitive	Mimicry	-	+	+
	Knowledge management practices	+	+++	++
	Enhancing absorptive capacities	+	+	+++
	Intensity degree of cognitive level	+	++	++
Global intensity degree of practices mobilization		+	+++	++

Table 2 - Intensity level of use of institutional innovation practices

4. DISCUSSION AND CONCLUSION

4.1. THE COMPLEMENTARY EFFECT OF INSTITUTIONALIZATION ON CLUSTER'S UPGRADING AND SUSTAINABILITY

Our case study reveals some complementary effects of institutional work at the cluster governance level. The implementation of the political, normative and cognitive levers facilitates the emergence of a specific institutional environment favorable to the cluster's upgrading and sustainability.

- Political practices benefit the building of the **cluster's legitimacy**.
- Normative practices facilitate the emergence of **institutional trust**.
- Cognitive practices participate to the constitution of **architectural knowledge**.

Cluster legitimacy, institutional trust and architectural knowledge represent the three pillars of the upgrading and sustainability of the cluster as a territorial value chain. Previous empirical works showed the importance of a well-structured and efficient cluster governance for a faster upgrading, i.e creation of value through innovation, and the creation of a sustainable value chain at the territorial level (Giuliani *et al.*, 2005; Hervas- Oliver *et al.*, 2008; Humphrey et Schmitz, 2002; Pietrobelli et Rabellotti, 2011). However, none of this works has detailed the concrete practices and the main levers that help the cluster's firms to create value beyond the mere transaction costs. The identification of those three components of cluster governance – namely legitimacy, institutional trust and architectural knowledge – is a first step towards the creation of sustainable territorial value chains.

4.1.1. Building the cluster's legitimacy

Legitimacy is a major source of acquiring resources and innovative opportunities (Zimmerman et Zeitz, 2002) as well as the foundation of the cluster's success and longevity (Human et Provan, 2000). Political practices of innovation favor the legitimacy building. In French top-down clusters, the question of legitimacy arises even more resonance. The issue of legitimacy is involvement, mobilization and accountability of all stakeholders. As the acquisition of resources is a key element for innovation, the cluster and its governance must be recognized as legitimate both externally and internally: for external stakeholders to recover resources and sustain them, and for cluster members to develop relations of trust ("communities") to work together on collaborative projects (Human & Provan, 2000). Studying the French competitiveness cluster PEIFL (Fruits and Vegetables in the south of France), Messeghem et Paradas (2009) show how the construction of legitimacy has been decisive for the emergence of the cluster as a recognized inter-organizational structure and "a major player in the fruit and vegetable sector". This legitimacy has also had a strong impact on innovation by strengthening territorial anchoring and promoting the development of collaborative innovation projects.

Savoie Technolac adopted initially an "outside-in" strategy (Human et Provan, 2000), that aims at promoting the cluster externally first (external stakeholders) before developing the internal membership cohesion. This strategy makes it difficult for members to appropriate the technopole as a legitimate entity and organizational form conducive to inter-organizational interactions (Provan et Kenis, 2007). However, recent governance practices tend to reorient

the strategy toward an "inside-out" one, fostering the legitimacy building of the technopole as an existing entity and a structure of interaction. At the opposite, Imaginove first concentrated on an "inside-out" legitimacy building in order to have all members agree upon the convergence project and slowly begun to revert the strategy. Meanwhile Axelera governance ran both strategies together, legitimizing the cluster internally in order to rapidly create cohesive and dynamic interactions on innovative projects, while seeking institutional recognition to establish the cluster as a legitimate and reliable partner for acquiring resources.

Human and Provan (2000) bring out the fundamental role of cluster governance in legitimacy building. They come to the conclusion that an "inside-out" strategy at the cluster creation seems more efficient for cluster legitimacy building and sustainability. Both strategies leaded by Imaginove and Axelera governances seem to confirm this statement.

4.1.2. Developing an institutional trust

Trust is a central concept in explaining collaborations of innovation since it can significantly reduce transaction costs and lead to the creation of new ideas. In clusters where members do not know each other, the creation of trust might be time-consuming because it requires repeated face-to-face contacts. In contrast, where institutional trust exists, both parties refer to institutional safeguards in their decisions and actions and can thus develop trust without having any prior personal experience in dealing with one another (Bachmann et Inkpen, 2011). Cluster governance, when developing institutional-based trust through normative practices, act as a personal third party guarantor for collaboration in innovation projects.

Institutional practices of normative nature, by building a cluster specific and collective identity and a network linking all cluster members in a system of shared representations, standards and common values, lay the foundations of an institutional-based trust that binds cluster stakeholders together. The regulatory and structuring framework generated by political practices reinforces the emergence of this institutional trust. In the context of French clusters, stemming from top-down initiatives and with few local anchoring, creating an institutional trust seems to be a valuable contextual variable to consider in the context of innovation. Indeed it might facilitate and speed the engagement of heterogeneous actors in interactive dynamics of knowledge and innovation.

In Axelera competitiveness cluster, where large leading firms coexist with smaller startups, the development of institutional trust is nearly a prerequisite for the early stages of

collaborative innovation projects for which contracts are often not a sufficient basis in the creative process of inter-organizational trust (Bachmann et Inkpen, 2011). The same applies for Imaginove and it explains why the governance emphasized from the beginning the normative lever more than the political one. Despite its stronger territorial anchoring and anteriority, Savoie Technolac did not succeed yet to develop this institutional-based trust in the technopole. Collaborations for innovation are still stronger outside than inside the cluster and the governance has a great challenge ahead in enhancing normative practices in order to develop a stronger institutional trust to foster internal collaborations.

4.1.3. Building the architectural knowledge

The third contextual variable resulting from institutional practices of cognitive nature is related to the creation of new and cluster-specific knowledge from collaborative innovation projects that we can assimilate to *architectural knowledge* (Tallman *et al.*, 2004). While political and normative institutional practices favor the conditions to create an adequate institutional environment conducive to better collaboration for innovation, cognitive practices rely on this environment to facilitate the creation of architectural knowledge as the combination of all actors' knowledge components. The architectural knowledge is a valuable source of innovation at the cluster level since it corresponds to non-transferable territorial resources and cluster core competences (Prahalad et Hamel, 1990).

Repeated interactions, particularly through collaborative innovation projects, foster the development of a stock of architectural knowledge that distinguishes the cluster from the rest of the industry and facilitates rapid dissemination of new knowledge through the cluster by increasing the absorptive capacity of firms (Tallman *et al.*, 2004). This architectural knowledge then positively influences the innovation of member companies and provides them with a competitive advantage, since it is not accessible to companies outside the sphere of the cluster.

Axelera organization in innovation ecosystems seems particularly relevant to foster the creation of architectural knowledge. Imaginove governance goes in the same direction in supporting specific devices for collaborative innovation projects (Project Booster, calls for specific projects on UNSG) and interactive learning dynamics (launch of Think Tank and laboratory uses Living Lab). Finally, in Savoie Technolac, creating an architectural knowledge seems to be limited, for the time being, to organizations linked to the INES.

The limit of architectural knowledge is how create it at the cluster level in order that every cluster member can have access to it – as if it were a "public" architectural knowledge – and not to limit its access to ecosystems' members or to those participating to collaborative projects. For Giuliani et Bell (2005), as for Tallman *et al.* (2004), the risk is great to create a two-tier cluster with a strong asymmetry of knowledge between businesses with access to knowledge networks and others, SMEs in particular. The active participation of the governance in the innovation ecosystems – for example as in Axelera with the mandatory presence of a member of the operational governance and a member of the strategic governance in the steering committee – could alleviate this potential asymmetry. The knowledge gained in the ecosystem allows the governance to play an intermediary role of "knowledge broker " and to integrate isolated in collaborative innovation projects.

4.2. CONTRIBUTIONS, LIMITATIONS AND RESEARCH AGENDA

Three main contributions can be pointed out. Our first contribution is theoretical since we propose an in-depth adaptation and extension of the model of institutional work to the analysis of cluster governance and its potential impact on firms' innovation, cluster's upgrading and sustainability. By focusing on concrete practices that can be implemented by the governance structure, we also contribute to the elaboration of practical management tools to create specific value at the territorial and cluster level. The institutionalization of the cluster through its governance structure enables the development of a sustainable territorial value chain. In addition, our analysis grid based on institutional work at cluster level constitutes an original benchmark tool or evaluation indicator for policy makers that can help to understand the observed differences of upgrading and sustainability between national clusters.

This study has also limitations that require further attention. Although multiple case studies are encouraged for greater external validity and a larger understanding of institutional practices of innovation, the conclusions are limited by the temporality of the case. A longitudinal analysis might deepen our understanding of potential innovative dynamics linked to the complementary effect of the three levers. Cross-sectional studies limit the analysis of institutional work as a process over time. Future research should thus seek to reedit the analysis a few years later in order to better evaluate the impact of the governance's institutional practices on innovation. The space might also be considered as a limitation. We focus our analysis on one region, the Rhône-Alpes region characterized by a high proportion of innovative clusters, an economic dynamism and a commitment to supporting innovation

devices. It may be interesting to compare our results with clusters belonging to other regions, in France or in Europe, in order to eliminate contextual bias.

This work contributes to a better understanding of the role of cluster governance on upgrading and sustainability of a territorial value chain. However, beyond the notion of cluster's sustainability – innovation, employment, and added value – the specificity of the French clusters of innovation, as a form of public-private partnership (PPP), and the variety of the concerned stakeholders raise the question of its responsibility. If we have now better insights of the determinants of the cluster's sustainability as a territorial value chain, we know nothing about the governance practices facilitating the control of this sustainability in order to create a truly responsible territorial value chain. Future research agenda might focus on this topic.

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