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IMPACT OF REGIONAL TECHNOLOGY POLICY ON LOCAL ECONOMIC DEVELOPMENT

38th Congress of the European Regional Science Association

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Abstract : During the last few years, the less favoured regions confronted to industrial decline, have evolved from attracting foreign owned branch plants to facilitating inter-firm collaboration in specific technological area. After defining the motivations that induce firms to cooperate, we focus on the issue facing public authorities which promote collaboration among SMEs. We conclude our analysis by drawing on evaluation of a project which was initiated by the Chamber of Commerce and Industry located in Bourges (France). Our study reveals that local inter-firm cooperation has not been fostered as expected by the initiators of this project. The limited external linkages developed by SMEs and their inability to establish common codes of information may explain this situation.

IMPACT OF REGIONAL TECHNOLOGY POLICY ON LOCAL ECONOMIC DEVELOPMENT

1. Introduction

During the early sixties, most of the French economic activity was concentrated in Paris and its suburbs. Aware of the limits of such a system, French public authorities decided to promote the transfer of public and private companies outside the Paris conurbation. This policy was reinforced by the strategy of french multinationals (Michelin, Renault, Thomson...). Seeking to employ unskilled employees which were less payed, they relocated their subsidiaries in the Paris basin where the working population was less skilled (Dupuy and Gilly, 1995). This move only concerned operating units. Research and development activities were maintained in the Paris area. This organizational scheme symbolized the Fordist mass production (Veltz, 1992).

Central government authorities and firms'headquarters were the root of this move toward regions surrounding Paris. The French local communities did not influence those transfers. After 1982, this was not anymore the case. Thanks to the law governing decentralization, local communities had access to new competences (Lachmann, 1997). The less favoured region, confronted to industrial decline, have tried to benefit from this legitimacy. To compensate the losses in employment in traditionnal sectors there has been a wide competition among these regions to attract additional productive capacities (usually foreign owned branch plants). However the effectiveness of these policies on the local economy has been rather limited.

In recent years, new initiatives have emerged. Local communities have understood that they were under the dependance of foreign corporations. Consequently, they have started to build local business networks instead of attracting existing plants.

At the same time, the national public authorities have begun to deconcentrate their power to regional agencies. Technology policies have evolved from supporting leading domestic firms (usually the largest in the defense, spatial and electronic sectors) to stimulating cooperations among small and medium-sized enterprises (SMEs), regional technical centers, universities and institutions. The primary goal of these policies has been to promote innovation and the diffusion of technological capabilities throughout the industrial structure.

In the present paper we will define the motivations that induce firms to establish collaborative relationships. Then we will focus on the issue facing public authorities which promote collaboration among SMEs and discuss the role of networks in innovation. We will conclude our analysis by drawing on evaluation of a project, sponsored by regional public authorities which try to facilitate interfirm cooperation.

2. Industrial cooperation : From exchange to production

According to the theory which have been chosen, the conditions that induce firms to cooperate are different. We can distinguish at least two approaches :

- The transaction cost perspective identifies cooperative agreements as an intermediate governance structure between markets and hierarchies. In this perspective, technology is dissociated from production which is secondary.

- The evolutionary theory considers that cooperation is a way to have access to complementary capacities and to reduce irreversibility costs. In this perspective, technology acquires its specific character through a learning process. We will place emphasis on the production activity.

2.1. Limits of the transaction cost theory

According to Williamson, asset specificity, uncertainty, the frequency with which transactions recur, bounded rationality and opportunism determine which governance structure is best suited to manage transaction (Williamson, 1989).

Low asset specificity favours competitive bargains and leads to contractual solutions. To explain the emergence of networks (the hybrid form between markets and hierarchies), Williamson invokes the existence of strong property rights combined with intermediary asset specificity. However markets and hybrid forms are not always adapted. When agents have to support durable investment, competition is transformed into a bilateral transaction. In such a situation, vertical integration is best suited to avoid opportunistic behaviors. This decision is considered as a choice of last resort. "Try markets, try long-term contracts and other hybrid modes, and revert to hierarchy only for compelling reasons" (Williamson, p.83, 1991).

Notwithstanding the interest of this approach to provide an analytical scheme for the study of networks, several limits remain.

- The primary goal of this theory is to know whether a firm should make or buy a good or a service. In this framework, firm and market are considered as perfect substitute. This situation derives from the assumption that information is costly for transaction purpose but not for production purpose. If one considers that the acquisition of information is costly, firms will not bear the same production costs. So it "might be in the interest of a firm to produce its own inputs even if transaction costs were zero and management costs were positive" (Demsetz, p.164, 1991).

Considering that technology is costly to produce also reverses the transactional approach. According to this theory, arm's length agreements for technology transfer are costly. Firstly agents are engaged in negotiations to define the terms of the contract. Once the agreement is signed, they undertake inspection to make sure that their partner is not shirking. Given these assumptions on opportunistic behaviours, transaction costs should reach prohibitive levels when innovation is involved. However, this is not the case. In fact negotiations which lead up to a bargain should not be considered as a cost but as an investment (Evereare, 1993). The time lost during the bargaining period increases the effectiveness of a project. Agents rely on this period to learn about their mutual needs and to take decision to avoid bottlenecks during the implementation of the project. Those permanent feedbacks help them to anticipate ex-post technical problems and speed up the access of the innovation to the market. It strengthens firms' competitiveness.

- The transactional approach puts too much emphasis on opportunism. By and large recurrent transactions lead partners involved in a network to gradually trust each other. These collaborative relationships entail learning (Lundvall, 1993).

- As one of the "four contemporary paradigms in the Theory of the Firm" described by S.Winter (p.187, 1993), transaction cost theory is first and foremost a matter of exchange and bounded rationality. Production is secondary. Consequently, it fails to "examine how new resource uses are discovered, how resources are accumulated, how firms learn, which governance structures best promote learning..." (Foss, p.12, 1996)

2.2. Cooperation as a learning process

Knowledge for production purpose cannot be considered as free. The role of the firm is not to allocate technical competences. They have to set them up. These competences change over time through a learning process and become tacit and specific to the firm (Foss, 1996). This change has crucial consequences for firms' performance and economic organisation.

- The tacitness of competences make them difficult to imitate. Therefore firms' endowments in technical capacities are not similar. Once they are built, they provide the firm with a competitive advantage (Chandler, 1990).

- The process of knowledge creation is costly to maintain. Therefore, firms need to achieve economies through specialization (Demsetz, op.cit.). This may explain why firms usually prefer to concentrate their resources toward core activities. To obtain complementary assets, two solutions are possible : Market transaction or cooperation. However, tacitness and specificity impede the completion of technology transfer (Teece, 1980). Thus firms cannot rely on market to have access to new capabilities.

Cooperative agreements are suited when firms are reluctant to develop additional capacities but need to have access to closely complementary and dissimilar activities (Richardson, 1972). It is sought when ex-ante co-ordination between different phases of production is necessary.

Despite production and transaction costs, firms should not be reluctant to pursue a strategy of cooperative agreements for at least two reasons :

- Considering that firms are not equally endowed with technical competence but need to construct them, increases the financial constraints which firms bear. In this scheme, investment costs are dissociated from receipts (Amandola and Gaffard, 1994). Thus it takes time to recover the initial investment. This view sketch a different framework to explain industrial cooperation. Collaborative relationships will release the financial constraints by helping firms to share the sunk costs associated with innovation.

- The second reason relates to learning. Collaborative relationships might take a hierarchical form. However when trust replaces uncertainty and opportunism, informal obligations may constitute a more stable framework for interaction (Lundvall, 1988). This is possible if firms consider that the future is more significant than the present (Jacquemin, 1987). In the case of user-producer relations, the frequency of interactive relationships have proved to speed up the innovation

process. Indeed, frequent communications help them to specify their mutual needs. in this case, unlike the transaction cost theory, recurrent transactions favour cooperative agreement. This interactive learning has three dimensions (Lundvall, op.cit., 1993) :

- Technical learning exists when interaction between producers and users induces an understanding of reciprocal needs.
- Communicative learning involves the establishment of technical code tacit and specific to the partners.
- Social learning limits opportunism by creating similar behavioural codes.

This second theoretical approach can give a new role for local public authorities.

3. The evolution of regional policy measures

In the last few years regional policies have evolved from attracting foreign owned branch plants to facilitating interfirm collaboration in specific technological area.

3.1. The limits of policies directed towards foreign direct investment

For many years, public authorities considered that it was necessary to attract additional productive capacities. Employment, and its consequences on the industrial environment was one of the most important concern of local communities dealing with multinational companies. But the effectiveness of these policies on the industrial structure has been rather limited. Branch plant cannot be considered as autonomous production units. They tend to have a technological strategy defined by their parent firm. Most of the time, this signifies that the value added locally in production of the final products is small. When inputs are supplied by imports to the facility, it reduced the importance accorded to local subcontractors. It may cause the elimination of locally integrated industrial system and reduces opportunities for the local economy. Moreover, it is likely that the absence of in-house R&D and limited contacts with local markets prevents the transfer of technology into the local economy (Amin and Thwaites, 1986).

Firms with headquarters located overseas may also disinvest from their host country and move to another region to benefit from other financial assistances if their territory does not provide them with specific resources. This makes endless the competition among local communities to attract existing plants by providing generic assets such as roads, telecommunication. These practices are familiar to every region and do not work for the integration of firms to the local economy. When firms do not invest lump sum of money, the costs of irreversibility are limited (Colletis and Pecqueur, 1995).

Disinvestment becomes a costless alternative. The case of Panasonic and JVC which set up in Longwy in 1986 and 1987 illustrates this situation (Le Monde, 15.10.1997). In 1997, they closed down their affiliates. At least two elements explain why the return on investment was so fast :

- Public authorities subsidized a third of the total investment.

- The branch plants were engaged in assembly activities which required unskilled labour. Consequently, training costs were limited.

These examples do not prevent policy makers to consider that large companies can reduce inequalities between rich and poor regions. Critics have pointed to the fact that the European Commission programmes are still providing financial funds to companies which invest in less favoured regions. These policies are "mainly addressed to fighting symptoms (like high unemployment) rather than causes (like low innovation potential)" (Morgan, p.496, 1997). However it is now accepted that the contribution of SMEs and research capacities to the regional economic development, cannot be neglected.

3.2. The role of regional public policies in networking activities

This new diagnosis is partly explained by the rise of peripheral economies. The role of SMEs in the origins and dynamics of this renewal has been considered as important (Pike, Becattini and Sengerberger, 1990).

For example, the economic recovery of the Swiss watch industry rested on the innovative capacities of SMEs. During periods of major technological change, they introduced new models and incorporated new technologies in existing products (Crevoisier, 1995). Large companies which did not respond to the introduction of electronic watches (they did not believe in the success of electronic and wanted to make profitable their previous investments), depended on local SMEs to achieve new levels of profitability.

Similarly, the resurgence and the competitive advantage of Italian textile companies derived from their ties with their external environment and from the quality of the linkages among different actors (customers, suppliers, competitors...). Other European firms which did not rest on such networks suffered from some weaknesses.

These performances are the result of a collective learning process which is embodied in tacit rules. This means that institutional and production system are difficult to copy (Storper, 1995).

Public local authorities can attempt to promote collective capacities for the economic development of their territory. If one considers that these capacities are not given but shaped through a learning process, this suggests that public authorities can still construct rules for collective actions.

Because of this situation, regional institutions help small and medium firms which innovate by gathering supply and demand for technology. Many intermediate agencies have been created to stimulate collaboration between SMEs and their environment (Blondel, 1995). These public intermediation structures are operating between scientific and productive areas. The role of the technological intermediary institutions are threefold :

- The first is to transmit information : SMEs are usually aware of the competencies held by research institutions. However, they have experienced difficulties to identify technological knowledge suited to their needs (Conférences des DRRT, 1996).

- Intermediaries do not confine their role to that of finding the best technology. It has to provide technological and organizational assistance to ease the transfer between SMEs and research institutions (Fiévet, 1997).

- Finally, they facilitate cooperation by discouraging opportunistic behavior. Intermediation is built on trust. Managers which fear to disclose information which will benefit to their main competitor should be less reluctant to inform their partners with the presence of intermediary institutions (Tripsas, Schrader and Sobrero, 1995).

By strengthening the dialogue between SMEs and their environment, public authorities have understood that SMEs can contribute to attract external investors. Indeed in many cases, multinational companies partly derive their competitive advantage from their industrial links with supporting industries (Porter, 1991).

Global companies will opt out regional network membership if their regional environment does not provide them with specific assets (Colletis and Pecqueur, op.cit.). When a region possesses specific resources, it reinforces the mutual interdependency between the foreign investor and its territory.

By giving the initial impetus to collaborations, regional authorities also helps SMEs to develop their networking activities. This is a key point for the effectiveness of regional development when we consider that SMEs encounter greater constraints than large companies to have access to technological and commercial information (OCDE, 1993).

3.3. The role of networks in SMEs'competitiveness

What distinguishes SMEs in comparison with large companies is not in that they are less innovative (Rothwell and Zegveld, 1982). The absence of hierarchical levels and horizontal communications favours quick reaction to keep abreast of environmental disturbances and fast changing market requirements. The crucial point is that they are often disadvantaged in their ability to gather technical information of paramount importance (GREPME, 1994).

Firms which benefit from interpersonal contacts through networks will gain three kinds of competitive advantages :

- Information is the nerve of competition which sets up among firms. Nevertheless, the complexity of information makes it more difficult to master. Because of their lack of financial and human resources, SMEs suffer vis-à-vis large firms, from an information gap. Networks are a way to get extensive contacts with agents of new technologies. They allow SMEs to decode and appropriate flows of information. The network validates their strategic plans for technological development. It reinforces SMEs'competitiveness by providing them with a window on technological change, sources of technical assistance, market requirements and strategic choices made by other firms.

- Tacit knowledge is very important in innovation (Senker, 1995). This knowledge which is not codified cannot be transferred through written documents (Dosi, 1988). It is embodied in the

personal knowledge of technical and scientific agents. Therefore, personal networks which favour acquaintances become the main channel for its transfer. To know who holds information is crucial when one faces complex technological issues. Members of networks "provide the know-why, know-how, know-when, and know-what necessary for entrepreneurial success" (Malecki and Tootle, p.45, 1996).

- Innovation is characterised by its uncertainty. Firms need to raise financial means as soon as they launch research projects. Conversely, results are uncertain and remote. Ten years can elapse from research to commercialisation. As time passes, resources become more specific. This augments the irreversibility of the firm's commitment. Moreover, in many fields, where technical changes are rapid and product life cycle very short, the acquisition of technology through traditional means (licence agreement) turns out to be risky and subject to obsolescence. By using either formal or informal networks, SMEs reduce their irreversibility costs and have access to new knowledge.

To improve SMEs' competitiveness and to encourage cooperative behavior, there has been a growing number of regional initiatives (Rosenfeld, 1996). The goal is to give the initial impetus for economic renewal. In the next section, we will focus on the approach which has been pursued by the Chamber of Commerce and Industry located in Bourges (Cher) - Cher is one of the six departments which composes the "Région Centre" -. In 1996, it has begun implementing a program to spur collaboration among SMEs. The purpose has been to persuade firms to increase their competitiveness and their market shares by developing networks.

4. The case of the center of sensors and automation development

There are at least three elements which make attractive the analysis of the intervention of the Chamber of Commerce and Industry :

- Firstly, this initiative tries to foster local interfirm collaboration. On the long run, such a policy should increase employment opportunities and the performance of the region in technical change. It illustrates the switch from policies directed towards attracting foreign owned branch plants to policies aimed at accelerating inter-firm cooperation.

- Secondly, it shows how public authorities can face the problem of conversion from military production. One of the aim of the Chambre of Commerce is also to help locally based companies that have been dependent on military contracts, to identify new potential markets.

- Finally, this intervention strives after promoting high tech activities (in the field of sensors and automation).

After having related the historical background of this local initiative and described its enforcement, we will focus on the results which have been achieved.

4.1. The history of the project aimed at developing sensors and automation activities

An association of engineers and scientists is at the origin of the center. In 1993, the conversion of the military sector became a major concern for them. They thought that local human

and industrial capabilities should contribute to renew the regional economy. New activities were necessary to compensate losses in employment due to the conversion¹. The sectors of sensors and automation offered promising opportunities. Some regional SMEs had already developed strong competitive position in automation networks and temperature sensors.

The region surrounding Bourges could also benefit from a technical military establishment which had long been dedicated to military-related tests. This establishment has recently entered into cooperative agreements with private companies.

In 1996, the Chamber of Commerce and Industry of Bourges carried on with this initiative and conducted a market study to know if it was profitable to use local technological competencies in the field of sensors and automation to have access to new business opportunities. Two niches have been identified : The agroindustries equipment and the domotic for handicapped people.

At the end of 1996, a project manager has been hired by the Chambre of Commerce and Industry to coordinate and drive the project.

4.2. The actors of the Center

4.2.1. The Chamber of Commerce and Industry

The first goal of the project manager is to ameliorate information flows among SMEs. This should increase business opportunities. Traditionally, the lack of technological skills was leading firms not to answer to competitive bidding. Under the aegis of the Center, it should be easier for SMEs to answer to competitive bidding which requires transverse capacities.

Another mission of the project manager is to promote collaboration among members and to identify new markets. The existence of the Center should encourage firms to join together to solve mutual problems.

To incite SMEs to participate, the project manager makes sure to provide services to SMEs which join the Center. These services range from the promotion of the brand image of the Center to the identification of new market and technological opportunities.

These different goals were translated into the organization of a business conference on sensors and automation in Bourges in 1997. The aim was to make SMEs managers sensitive to the application of microsystems and to help them to meet scientific, technological and financial partners.

The Chamber of Commerce awards its financial support in collaboration with the city of Bourges, regional and departmental public authorities, the Regional Office of the French Ministry for Research and Technology (DRRT), the regional Office of the French Ministry for Industry and the European Commission. For two years, the Pole has received 7 millions francs (about 1,06 millions Euros). During this period, the Pole has proposed its services free of charge. Indeed, the

¹The district of Bourges has suffered from the rise of the unemployment rate. Between 1989 and 1995, the number of employees has decreased from one percent in the area surrounding Bourges while it rises (+1,8%) in the whole administrative region (Carriou, 1998).

aim is to allow SMEs to pool their resources and to prove them that without this collaboration, projects will not have been carried out. At the end of 1998, there will be an entrance fee.

4.2.2. Characteristics of SMEs

13 SMEs belong to the Pole. These firms are located within a radius of 60 kilometers around Bourges. This proximity should help them to establish common codes of behaviour.

Firms belong to different sectors of production. In the mind of the initiators of the project, if firms were competing with each others, it would have prevented them from establishing cooperative agreements. By gathering SMEs with complementary capacities, it widens the opportunity to have access to new markets.

Firms' core competencies can be divided into five sectors :

- Automation, industrial weighing and electrical equipments group together 4 firms. None of them is integrated into a large company. Their number of employees is ranging from 15 to 60. The existence of a design office favours the success of cooperative relationships. It proves that these firms have already structured their innovative capabilities (Bougrain, 1997).

- The four firms in the sensors and instrumentation industry are more heterogeneous. One of them employs just two people. Compared with the others, it does not have the same expectation. By joining the Center the manager hopes to develop business opportunities. It does not expect to increase the technological level of his company.

Among this group, another firm employs about 300 people and dedicates 15% of its sales to research and development (R&D). This firm can be considered as the leader of the Center.

Despite different sizes and strategies, these firms are marketing their own products. Except the smallest firm which supplies the agricultural market, the others have established closed commercial relationships with aeronautics firms and have been awarded ISO 9001 certification from the "Association Française pour l'Assurance Qualité". They had already forged external linkages with educational establishments, research associations and clients.

- Micromechanical and microtechnical firms are subcontractors of the aeronautics and defense sectors. They have already established commercial relationships with some firms belonging to the sensors and instrumentation industry. Each of the two firms employed 30 employees.

- The penultimate category gathers two firms which manufacture heating and air conditioning appliances. Both of them are subsidiaries. One has recently been bought out by a French group. But it is quite autonomous in its business activity. The other is controlled by an Austrian group. The product line is defined by the group. Most of its subcontractors are selected on an international basis.

- Finally, one firm is specialized in industrial software and data processing integration. Its activity and know-how differ from those of the other companies.

This diversity has been deliberately pursued by the investigators of the Center. They did not try to recreate the same organizational structure as in Italian districts. Inside these districts, firms are usually involved in few stages of the production process (Brusco, 1990). They also belong to the

same vertically integrated branch. Interdependencies and strong specialization provides them with strong market positions in their own sector.

The running of the Center is quite different. The aim is to develop products which are away from firms initial activity. Diversification is possible because of collaboration. When they have to face a competitive bidding SMEs should be able to take on more complex tasks. Operational tasks are not divided up a priori. It clearly hinged on the evolution of the project and SMEs skills.

4.2.3. The industrial and scientific committee

The industrial and scientific committee constitutes the third entity. It is composed of industrial and key figures representative of the scientific community. It gives its advices on orientation and special questions.

4.3. The evaluation of the sensors and automation development

4.3.1. Methodology

Tempting to evaluate the impact of the Center so early in the process faces at least two hurdles:

- Carrying out an assessment may be considered as premature. Far too little time has elapsed to appreciate changes in the performance of individual firms. With the passing of time, one would have judged better economic, technological and organizational spillovers.

- Secondly, it may seem presumptuous to isolate the outcomes of a specific action when one knows that economic phenomena are usually generated by multiple actions.

The assessment draws on a questionnaire which was sent to SMEs. Ten out of the thirteen enterprises have returned it or/and accepted in-person or telephone interviews. This was used to improve the quality of the survey that we collected.

4.3.2. The results of collective actions

The evaluation of public intervention focuses on three issues :

- The extent to which inter-firm collaboration has occurred.
- The degree to which collective action has lead to the access to new markets.
- The scope to which access to technological and commercial information have become easier.

According to these three points, the assessment is ambiguous. Two years after the creation of the Center, interfirm collaboration is rather limited.

Among SMEs, only two firms which did not have any relationships before the creation of the Center, have initiated a technological partnership. With a third company, they have joined together to develop a new product. This collective activity has resulted in an increase in revenue for the smallest firm. Two others SMEs have also signed a sales agreement. One firm in the micromechanical industry supplies one of the two firms which manufactures heating appliances.

According to the firms which have collaborated, these new relationships have lead to limited technological and commercial spillovers.

The two niches which have been identified by market studies did not generate yet an increase in sales. However, new firms have been approached. One manager considered that it could engender new business opportunities. These weak commercial spillovers should not lead SMEs to hire supplementary staff.

However, thanks to the project manager, firms gain access to new sources of information. They have developed new contacts with their external environment. Eight of the ten which responded to our survey, declared that by joining the Center they have expanded their information networks. The organization of a conference on sensors and automation was also considered as a positive event. It was a good way to improve the public image of the Center vis-à-vis potential partners.

This proves again that one of the main problem facing SMEs is their inabilities to forge suitable external linkages.

If one examines the expectations and the results, one can be disappointed. Thus, it seems necessary to explain why SMEs have been reluctant to cooperate to be more effective in the field of innovation.

4.3.3. Obstacles to collaboration

Business people were asked about the obstacles to their involvment in collective actions. Some of them consider that the goals of the initiators of the Center are to ambitious both from a commercial and technological point of view. They are keenly aware that market studies seem to afford interesting outlets. However, the niches which were identified, are not linked to the sales capabilities of the firms. The firms feel that it is very hazardous to diversify their production in those fields of activities.

Few executives believe that it would have been more effective to reply to competitive biddings which are connected to their technological know-how. Such collaborations would have been less risky. It would not have provoked the emergence of costly investment. Firms would have progressively learned to work together. When complex equipments are developed uncertainty is considerable. Cooperation is necessary because the characteristics of the product are unknown. But it takes time to establish common codes of information (Lundvall, 1988). Most SMEs which have limited external linkages with their environment (four of them declared that they did not have technological relationships with other firms in their daily business), are not ready to invest time in complex partnership agreements. They are already struggling to keep their market share in their own business.

Most SMEs are not involved in the meetings organized by the project manager when it is necessary to discuss about the needs of the firms. These attitudes are not propitious to the development of close interaction among SMEs. Consequently all the firms are not aware of the needs of the member of the Center. The lack of time due to business pressure may explain the

adoption of this strategy. These results confirm that failure to realize benefits quickly enough can prevent SMEs to develop time consuming collaboration (Rosenfeld, op.cit.).

The heterogeneity among firms can also be considered as a drawback. Few firms share an homogeneous system of value and views. One distinguishes two groups of firms : The first is composed by high-tech firms which export a large part of their production, have already pooled their resources with another partner and are used to benefit from financial public aids. The second comprises SMEs which belong to traditionnal industries, are less innovative and hope that the creation of the Center will lead to an increase of their turnover.

5.Conclusion

The Bourges area which has been weakened by the conversion from the military sector, strives to diversify its production activities. The development of the Center for sensors and automation lies within the scope of this new policy.

The historical background of the Center is to recent to affirm that this attempt will be crowned with success. For the moment, the results are quite far away from the expectations. Local interfirm collaboration has not been fostered as expected by the initiators of the project.

Moreover, the distance from Paris does not permit to benefit from the setting up of new industrial companies. Inside the "Région Centre" which gathers six departments, only three have succeeded during the last years to attract new investors. Their geographical proximity with the Paris conurbation explains this situation. In any case, this structural weakness constitutes a strong limit to the economic development of the area surrounding Bourges.

A promising future for this region might be the presence of technical higher education institutions. Indeed, during the last few years, regional authorities have decided to promote the location of university branches, technical and engineering schools outside the "capitals" (Orléans and Tours) of the "Région Centre". Cities such as Bourges have strongly benefited from this policy. In the future, it could contribute to create a common system of value and to develop technological partnerships. However, such positive externalities strongly depends on the degree of interaction between industrial companies and higher education institutions.

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