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INDUSTRIAL DISTRICTS AND INNOVATION NETWORKS: NEW THEORIES AND CONCEPTS FOR ENTREPRENEURSHIP DEVELOPMENT

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ABSTRACT

Over recent years, the study of industrial districts, inter-organizational relations and networks has become a major theme of interest in entrepreneurship research. Theories point to a new form of entrepreneurship and firm development which is based on the idea of creating links between firms to increase their chances of success and development. In this paper, we will present some data from a research we have conducted in Canada, in the province of Quebec to be exact, but first, we will present the theoretical perspectives which appear relevant to such investigation, which aims at developing a better a socio-economic model of the firm, as well as inter-firm relations, particularly as regards innovation and technological learning and transfers.

Introduction

In the present context which follows from recession and slow growth in the 80s and 90s, many industries and services are having difficulty in maintaining their competitiveness. In the light of present difficulties to restore competitiveness in many industries and services, cost competitiveness and product/industry cycle theories have been questioned by many theorists, as well as practitioners (managers) in firms. New theories based on the concept of "diversified quality production" , amongst others, were being developed to try to explain and propose new avenues for renewed competitiveness in "mature" industries. (cf Sorge and Streek, 1987; Tremblay, 1989). These last theories point to new factors of competitiveness, such as quality of human resources management, entrepreneurial behaviour and organisational and technological learning , which appear to be as essential as technological innovation per se in order to move to "diversified quality production" and to restore competitiveness in industries or services considered as "mature" or declining. Other factors such as linkages to the local economy and invisible labour market factors were also put forward by authors such as Doeringer, Terkla and Topakian in a book called "Invisible factors in Local Economic Development", which highlights the importance of these invisible linkages in the renaissance of the Montachussets economy in the US. Finally, it is important to refer to the litterature on "industrial districts" as this material also points to a certain number of invisible factors which are favourable to economic development, amongst which the constitution of networks and the development of confidence and close relationships between firms.

Although this is apparently contradictory with the traditional perspective of the firm, which is based on competition between firms and does not admit the possibility of cooperation between firms, there appears to be more and more evidence to support this theory of the cooperative firm, particularly as regards technological and organizational innovation.Recently, the study of industrial districts, inter-organizational relations and networks has become a major theme of interest in entrepreneurship research. Questions related to the boundaries of the firm, to the kind of inter-organizational relations, to transactions and to sources of success in firms' networks have become central to many studies related to small business development and entrepreneurship, although not very much empirical work has been done, at least not outside of Europe and particularly of Italy, where the "industrial districts" concept has reemerged a few years ago and spurred much research.

Before we present the data from our research, we will start by defining the concept of industrial districts, to see how characteristics of this idea may be present in our observations, although they might take different forms. Secondly, we will refer to the writings of Doeringer, Terkla and Topakian on the question of "Invisible Factors in Local Economic Development", which refers to the title of their recent book. Having presented the relevant theoretical dimensions, we will present the data from our research in the second part of the paper.

PART I. THEORETICAL PERSPECTIVES

1. The concept of industrial districts and the flexible small firm

For quite some time, the general trend of industrialization was in favor of large firms, large entreprises, large production units. With the exception of a short spell in the 30's, there has been an almost continuous development towards larger units, larger entreprises, larger firms, and more and more centralization in the industrial structure. However, over recent years, there appears to be a reversal of this long term industrial trend in almost all industrialized countries. Starting in the 70's, there has been a certain shift back to small firms and small establishments. The latter appear to be responsible for most of the job creations, whereas large firms used to be credited for this previously.

The question is: why did this happen ? Is it true, as some say, that the smaller units offer more flexibility? And is this possible without developing precarious conditions of work in these small units? There are various explanations for this phenomenon. Some would argue that small firms have lower wage costs and lower labour costs, and therefore there is a shift in favor of small firms. In this perspective, it appears that labour is paying the price for the increase in flexibility of the firms. Others might argue that small firms could be more efficient, more productive, more innovative, that they can more easily adapt to new market trends and new needs in production. There are various others explanations, but it's hard to argue in general that small firms are always more efficient, more productive. If they were, it would be hard to understand why firms should have grown in size for one hundred years, for the entire period of industrialization, and suddenly the average firm size would decline again. There must be other reasons behind this trend, and there are two which appear to be fundamental.

First, as we mentioned previously, the economic environment in many parts of the world, and specially in the industrialized countries, has changed. Today, there is a much stronger demand for a different type of product: higher quality product, more differentiated services and products. The economic stability that characterized the world economy until the early 70's, more or less until the end of the Bretton-Woods agreement, has been lost: there is much more turbulence today, there is a need for much faster adaptation. The average life of a product -- the product cycle -- has shortened considerably; while the cost of producing a product has increased considerably. Secondly, the cost of technology has changed. With the advent of the micro-computer, and micro-electronics, the small firm can also easily purchase a computer. There has been a shift in consumer demand and in the basic business structure, and in some ways, this favored the small firms. Both these elements appear to have favoured small firms. However, small firms in Qu,bec or Canada do not all seem to be benefitting from this new environment, whereas the Italian firms in what is known as "industrial districts" have profitted greatly from the situation. Let us look at the characteristics of the industrial districts to try to determine the main reasons for their success.

As we know, the industrial district can be defined as a conglomeration or a network of many hundreds, sometimes thousands, of small firms in one particular industrial sector, in one industry, where these small firms specialize in particular activities. For example, in the so called Third Italy -- in the centre and north of Italy--, there are eighty or ninety industrial districts, according to authors like Brusco and Beccatini, amongst others[1]. These districts specialize in all kinds of industries: in machinery, in various consumer goods industries, such as textiles, clothing, footwear, ceramics. And more important in terms of specific characteristics of the Italian model of industrial districts, these thousands of firms in one locality specialize in a particular stage of production. In addition, some firms specialize in particular services, producer related services or business services: for example, there are firms specializing in the design of a product, there are firms specializing in research and development, others specialize in marketing, in exporting, and even in banking and financial services for the industrial districts. This makes it possible for these firms to benefit from advantages similar to those of large firms in terms of cost reduction through specialization, amongst others, as we will indicate in the coming paragraphs.

By specializing, the small firms are enabled to benefit from similar advantages as those of large firms: they benefit from the improvement or the higher quality of production or service, as a result of specialization. They also benefit from increased economies of scale: if they bring together many firms, they reach levels of production which usually only the large firm can afford (and they do this without giving up their individual flexibility, as we will see furthr on). Beyond the specialization of firms in particular activities, there obviously needs to be cooperation between them. And for this cooperation to develop, there must be particular institutions in the district that coordinate all these activities. The industrial district is therefore a conglomeration or network of many different types of firms specializing in a particular stage of production, or in producer services or in business related services, which is characterized by a high degree of cooperation.

A second important aspect is the simultaneous coexistence of this cooperation and competition. The cooperation is organised: specialization requires some form of coordination and there also needs to be some relation between market and production. For example, in some of the Italian districts, which are very competitive because they furnish highly fashionable products (knitwear products of Benneton, or other textile fashions), there are persons or firms responsible for

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ensuring a quick response of the production to new fashions. This person or firm is a kind of super-entrepreneur who knows the market very well and who knows all the producers. In this way, there is an effective link between production and the market -- the product market. This is one aspect of the question, the cooperation and coordination element. The other is competition.

All this refers to some type of industrial atmosphere, specific links between businesses and the community which are to a certain extent quite original. We can ask ourselves if it is a typically italian model, or whether it can exist elsewhere, in different forms or in similar forms. The "industrial district" was discovered first in Italy, in what is called the Third Italy: provinces like Toscany, Emilia Romagna, Venezia, and other provinces (Goodman and Bamford, 1989). It does not exist in other parts of Italy. There have been attempts to implant this model of industrial districts from the centre and the north of Italy to the south, to the Mezzogiorno, but there has apparently not been much progress.

The reason appears to be that these industrial districts flourish only in a particular political, institutional and social environment. And there seem to be in this so called Third Italy specific conditions, which are conducive to small firm development, such as a tradition of cooperative, amongst which in agricultural cooperatives, a very effective local government, a good infrastructure, ÿas well as internal training and apprenticeship traditions in the firms. Indeed, an important characteristic of the model is that the many entrepreneurs used to be formal workers in other firms: they often left some large firms in the 60's to set up their own business, and they were usually highly skilled craftsmen. This is another important condition: a good technical and professional training in an area. These Third Italy provinces provided this training, mainly with the help of public institutions. These conditions obviously do not exist everywhere.
This last element can be associated to organizational or technological learning, and in this sense, the industrial district represent an alternative to traditional industrial or innovation policies; as the Japanese model also shows, they can be seen as a form of decentralized participation of workers and firms in the innovation process (Tremblay and Rolland, 1996a).

While there are surely historical and institutional specificities to the Italian "ÿmodelÿ", as in the Japanese case, some authors have discovered that industrial districts or similar forms -- small firm industrial communities or localized systems of production -- exist in some other parts of Europe: for example, in the South East of France (around Montpellier), in the region Rhone-Alpes, in the state of Baden-Wurtenbergÿin southern Germany, in Denmark, in Sweden.

The characteristics of these situations are not identical to that of Italian industrial districts. However, if we look at how they are organized, we do find similar organizational principles: 1-there is tight cooperation of small firms in particular communities; 2- the coexistence of cooperation and competition; 3-the strong support from local government. These local and community institutions are apparently important for the small firms to flourish. It is on the basis of this thesis concerning industrial districts and similar models, that we investigated in the case of Quebec, to determine whether we could find some similar situations and characteristics.

2. Invisible labour market factors and linkages to the local economy and community

In their book entitled "Invisible Factors in Local Economic Development", Doeringer, Terkla and Topakian try to identify the factors which might explain the economic revitalization fo the Montachussetts region in the North East of the USA. The essence of the explanation boils down to the provision of specialized products and services generated through niche-seeking strategies of specific firms, as well as communitywide business or inter-firm network effects that reinforce these strategies by reducing production costs. Most noteworthy, according to the authors, are agglomeration economies among local firms, through input-output relationships and other forms of linkages. Here again, as in the Italian model, the agglomeration economies based on input-output relationships are very rarely based on visible cost competitiveness. According to the authors, they are based on the ability, derived from physical proximity, to participate in and respond rapidly to changing design and manufacturing practices. For many clusters of firms, as the authors call them, proximity is an important factor in both flexibility of production and cost competitiveness. They also indicate that it can reduce inventory costs throught "just-in-time" deliveries. Also, where quality is an important aspect, proximity makes it possible for firms to consult with each other quickly in order to resolve problems over product specifications and the like. (cf Doeringer, Terkla and Topakian, 1987). Linkages to the local business community therefore appear important in order to adopt a strategy of diversified quality production, particularly if "just-in-time" (JIT) is included.

Again, in their book entitled "Invisible Factors in Local Economic Development", Doeringer, Terkla and Topakian identify some factors related to the labour market which influence business competitiveness in the Montachusetts region. The authors actually feel that the most important communitywide contribution to business competitiveness comes from labour market factors of which some can be associated to organizational learning. They admit that these factors have traditionnally contributed to the success of the local economy, as is the case almost anywhere, but indicate that these factors become of "paramount importance" as the economy evolves towards specialized custom production. Amongst these "invisible" labour market factors, the authors mention specifically skills, labour availability, the absence of wage pressures, and particularly important the workers' attitude which favours good productivity, as well as the quality of labour-management relations. All these of course favour the development of internal labour markets, as well as technological and organizational learning.

To summarize the authors, the invisible factors responsible for the good performance of Montachusett economy are essentially the niche-seeking strategies, agglomeration economies, and flexibility in labour markets; other elements often put forward in the litterature on the dynamics of competitiveness, such as changing technology, R & D and patterns of business ownership do not appear as important in the Montachusett context. It is on the basis of these various theoretical perspectives that we undertook our research, to try to see whether these aspects could also be found in a region of Qu,bec where there seemed there could be innovation networks and where the economy was not doing too badly over recent years. Our objective was to test for the presence of various aspects identified in the literature and to try to determine whether these invisible local factors had some influence on business development in a particular region.

PART II. EMPIRICAL FINDINGS

3. Some evidence from a research in Quebec, Canada

Considering the fact that there has been very little empirical research on the question in Quebec (only 2 researches underway, in 2 other regions, to our knowledge, and no final reports from these), our data present some interest, alghough they cannot be considered totally conclusive, being based on some 100 firms. It is interesting to note that our data lead to a conclusion similar to that of Bernard Ganne (1990), in his report for ILO on "industrial districts or localized industrial systems", where he concluded that although the industrial district theory does point to some important elements of firms' competitiveness, the situations observed do not conform perfectly to the model. Our research results also do not confor perfectly to the model, but there may nevertheless be elements of firm networks and innovation exchanges of interest for the analysis of small businesses.

Our research was based on the analysis of some 104 firms in Quebec. We proceeded with two methods, that is an in-depth interview procedure and survey questionnaires. A short version of the questionnaire (with closed questions: yes or no, or choices of answers) was mailed to firms from 4 industrial sectors covering all regions of Quebec: textile and clothing; paper; electrical products; and furniture. We wanted to compare not only different industrial sectors, but also different regions (at least 2) in order to try to see whether there were regional characteristics to the organisation of the industrial systems. In this perspective, we conducted more detailed interviews in some 40 firms from two specific regions[2];.

In this last part of the paper, we will refer to some of the elements presented previously inasmuch as they give information pertaining to these subjects. In this sense, the first question which appears to be important is the question of the move from mass production to customized production, as well as the evolution of product cycles and emergence of the "new flexible firm". In our questionnaire, we asked a few questions pertaining to this subject, which I will now go over. All full tables are not included here for lack of space, but are referred to and are available upon request.

3.1. The emergence of the new flexible firm

One of the firs things we wanted to determine in our research was whether Quebec firms were actually moving towards a qualitative, techno-organizational strategy, whether they still had a pure cost-minimization strategy, or whether they were somewhat in between the two, with a combination of both strategies. The data do not indicate a definite shift towards a pure qualitative, techno-organizational strategy, but do indicate some evolution along these lines. We asked firms whether they had done some type of innovation over recent years (5 to 10 years). The great majority indicated they had developed or introduced new technologies (63 % of all firms), new products (76 %), and new forms of organisation of work (68 %). There is a clear trend towards innovation, and it is interesting to note that while new technologies attract most of the public attention, product and organisational innovation appear to be more important and frequent, something which we also observed in previous research (Tremblay, 1989).

Other research results[4] reveal the firm's perception of its main competitive advantage, as it indicates what the firms think are the reasons for which clients buy from their company. Firms were asked to classify the various possible answers on a scale from 1 to 5 (it was possible to give more than one answer), and the "superior quality of products/services" comes first in terms of highest percentages; it is also the answer which is less often considered negligible. Compared to prices, 48 % of firms identify quality and 43 % identify customized service as the main reason why people buy their products, while only 25 % consider price the main reason for sales. Under 5 % and 9 % of firms consider quality and customized service respectively as totally unimportant. Other possible answers such as proximity of firm, fidelity of clientele, dynamism of personnel, characteristics of the firm (coop. etc.) rate somewhere in the middle.

Another question (see Table 3 of original results; tables not included for lack of space) asked firms how the evolution of international and national markets had affected their product lines: 50 % indicated it brought them to develop new

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customized product lines for specific market niches, 42 % that it brought them to renew product lines more frequently (i.e. reduced product cycle), 65 % to produce more high quality products, and 66 % to manufacture a greater number of products. Only 18 % indicated that they had reduced the number of products. There are small variations according to industry, but we do not detail this here. We asked firms whether they had adopted means to reduce their production costs over recent years, and 92 % answered positively, 71 % saying this was because of Canadian firms' competition, and 45 % because of international competition (it was possible to give both answers - see table 4). For those who answered positively (92 %), we asked what means they took in order to achieve the most competitive production costs. Here, although the increase in quality of products comes first (86 %), followed by the development of better qualification of personnel (84 %), and then modernisation of equipment (81 %), and production process evaluation (80 %), "keeping labour costs as low as possibel" comes fifth with 75 %. Only direct participation of workers (64 %) and search for less costly raw materials or intermediate goods. (cf. Table 4). It thus seems that although quality is a priority, it has not totally superseded the control of labour costs.

We asked firms what they had specifically done to modify quality of production (cf.Table 5) : 84 % indicated better quality control at each stage of production by the workers themselves; 75 % indicated they had tighter inspections of products before delivery; 71 % indicated they frequently modified products to adjust to specific clienteles; 59 % said they had a Total Quality Program; and 40 % indicated they had a better service for repairs of defects in products.

In our view, firms that have a better repair or defect service cannot be considered as having adopted a quality strategy; to a certain extent, this is more of a defensive than an offensive strategy towards quality. The possibilities and means for developing quality obviously differ according to type of product; for some firms, in printing or in industrial textiles for the paper industry for example, it is impossible to correct defects in materials.

Firms were asked whether they had taken measures to increase productivity, and 78 % said they had. As concerns the specific measures taken, they are as follows (cf.Table 6):
-79 % (of the previous 78 %) indicated they changed machines or equipment;
-75 % had adopted new methods of leadership in the firm;
-74 % changed work organisation;
-57 % increased the percentage of hours of capital (equipment) use.

In order to adjust to rapid variations in demand, we asked firms to identify the main strategies they used (cf.Table 7):
-89 % said they do daily production planification;
-82 % try to plan and control incoming orders ;
-78 % will have workers stay in longer hours;
-72 % try to have a better coordination between various sectors of the firm;
-60 % hire temporary workers at times.

All in all, the objective of a better quality product seems to be emerging, but firms have not rejected the traditional cost minimization strategy which rests on the reduction of labour costs, through variations in hours of work and/or temporary personnel.

3.2. Linkages to the local economy and firm networks

In the section on industrial districts, we identified various factors related to the local economy and community which might explain the performance of certain local economies. Characteristics of the institutional and social environment, the tradition of cooperation, existing simultaneously with competition, the availability of skilled labour and the proximity of public educational institutions. From Doeringer et al.'s research, we observed that just-in-time inventory management systems and the increasing importance of product quality and reliability in deliveries tend to reinforce the importance of close-knit and permanent relations between suppliers and producers, as well as between users and producers. Our research did not investigate the latter, but did ask questions on the relations between suppliers and producers.

First, let us indicate that some 47 % of all firms surveyed do some subcontracting for others, while 44 % give out work in the form of subcontracts. The percentages vary from firm to firm (Table 1), plastic, printing and electrical products being much more active in doing subcontracted work (61 % and 79 % of firms in the plastic and printing sectors) and in giving out subcontracts (68 % in electrical products firms). Analysis of the interviews indicates that subcontracting does in some cases permit the development of close-knit relations between supplier and producer. However, many firms seemed to have as close-knit relations, if not closer-knit relations, with affiliated firms (head office or other affiliates of a multinational).

Most of the firms' markets are in the province of Quebec, over half of them selling in Quebec, while only 12 % or so are present on international markets, 18 % in the province of Ontario, 6 % in Western provinces (Table 15). Some 18 % of firms indicate that they have local markets, which we defined as the MRC (municipalite regionale de comte - county regional municipality). However, international links are often more important in terms of R & D and other relations

between affiliates and head office. The printing sector is the most involved at the local level, with 43 % of firms selling at this local level (MRC), while all other firms are around the 20 % mark, and plastics just over 3 %. On the opposite, the paper industry is the one which is the most present on the international markets (41 % of firms).

We asked firms why they chose to establish themselves in their municipality; on this question, no clear trend can be found, although labour market factors appear to be important for many. Answers are distributed between quality of labour (26 %), flexibility and polyvalence of labour (21 %), proximity of suppliers (20 %), proximity of markets (20 %), presence of firms of the same production sector (14 %), place of residence of owner (23 %) and financial aid (13 %), with many firms (35 %) indicating also various other factors. For example, the presence of a university (Un. of Sherbrooke) is important in some cases; the local Economic Council or Chamber of Commerce sometimes played a role (St-Hyacinthe); dynamism and personal contacts of the mayor was a major factor in bringing firms to establish in two particular cities (Granby, Bromont). In any case, labour and proximity factors seem important and information from interviews might give more weight to these factors.

To determine with whom firms had relations in the community, we asked questions concerning their relations with local suppliers, banks or credit unions. Some 52 % of firms have relations with local suppliers, 66 % with local banks and 15 % with local credit unions. More qualitative information are present in the interviews, for example concerning questions of trust, and other qualitative dimensions of personal relations, very often with the mayor, as is the case with the cities of Granby and Bromont. In this last case, other elements such as governmental subsidies, social and cultural activities, also played a role.

3.3. Networks and cooperation in R & D

One of the points we were interested in analysing was the relation between formal or informal networks and cooperation in R & D. Preliminary analysis of simple regressions does not indicate a very strong support for this hypothesis, for the data in general, nor for the region which we studied in more detail, the Monteregie. We are presently working on more detailed analysis, but will present general data; comparative industry data also present in the tables will not be presented in full detail here. As concerns specifically R & D, only half (48 %) of the firms did declare R & D activities for fiscal purposes in the last fiscal year (1990). Some 23 % of firms indicated they did R & D on an ad hoc basis, when it was needed. Some 66 % of firms that did R & D (on an occasional or systematic basis, that is 74 % of total firms) indicated there was a trend towards an increase, 8 % said it was declining and 25 % it was stable. (Table 8)

We asked firms if they had worked with partners in order to create new products, adopt new technologies or develop organisational innovations. Some 46 % of all firms did work with some partners, the percentage being higher (73 %, 14 out of 19 firms) in electric and electronical products (Table 10). In most of these cases, technological change and organisational change were closely associated and often brought about the creation of an informal working group. We also asked the firms to identify the reasons for which they chose these partners. Of the 48 firms that did have partners, some 42 % chose the partner because of prior personal acquaintance, 21 % because of its proximity, while 54 % gave technological capacity as the main reason. Subcontracting (15 %) and partnership of affiliates with head office (33 %) as well as prestige (21 %) were also given as answers (Table 10). Firms were specifically asked whether they had R & D cooperation agreements with other firms. Over 37 % had chosen other firms as partners, while some 12 % had some form of partnership with educational institutions (Table 13). When they did have some links with other firms, it was more often with foreign firms (49 % of firms that had some form of cooperation), with Quebec firms (30 %), with Canadian firms (21 %) and finally, less frequently with local firms (19 %). As we can imagine, given the importance of foreign firms, the majority of these links were actually links between head office and affiliates: in 52 % of the cases the foreign firm was the head office and in 17 % of cases, it was an affiliate. In 21 % of cases, the firms werre independant of each other and in 15 % of cases the Quebec firms produced for the other firm. (Table 13). Out of the total of firms, under 10 % are part of a formal network of R & D, while almost 52 % are part of an informal network, in the sense that they exchanged informations with other firms. These informal networks are particularly important in the sectors of printing, electric and electronic products, food and beverages. (Table 13).

To develop more on the community and business networks, we asked firms if they had received technical informations from various sources. The majority of firms responded positively, but local firms do nota appear dominant (Table 14):
72 % of firms had receivde such information from suppliers;
39 % from clients who bought from them;
23 % from the head office;
21 % from provincial government agencies;
18 % from colleges;
17 % from universities;
14 % from federal government agencies;
and only 11 % from local firms.

Firms also were asked to give information on the type of help they received from partners. The most frequent answer was help in materials and supplies (52 %), followed by the solution to production problems (38 %), help with computer hardware (20 %), computer software (20 %) and know-how (17 %).

3.4. General results from the empirical research

There are basically two ways of developing small and medium size firms in the perspective of technological and innovation development, as well as regional economic development. One is through linking small firm development to the development of large firms, that have a higher capacity for R & D and innovation. The other way would be for small firms to form groups or networks, to get together with other small firms, in order to create large - formal or informal - units. Why would they have to do this ? This is probably related to some of our observations concerning the problems of small firms, that is not the fact of being small, but rather being isolated and with little information and power. How can this be explained ? Compared to the large firm, the small firm lacks resources to fulfill all the functions that a firm has to meet in the present competitive context, that is R & D, technological development, designing a product, manufacturing a product, marketing it, financing the distribution, and assuming the cost of new development, as a result of the accelerated product cycle. In some way, the firm has to generate all these resources, and that means the small firm has to either rely on the large firm for resources transfer or on other small firms. Relying on the large firm is the method that has been perhaps best developed in Japan, where large firms contract out most of their production to medium size and small firms, and the large firms tend to transfer resources -- their know-how, their capital, their human resources, their skills, their technology to the small firm. This is one way of developing small firms and this is actually one of the most frequently observed in our research. To a certain extent, results seem to indicate that this is the model which is more frequent in the region of Monteregie, particularly in the Bromont region, although it does not benefit all small firms.[5]

3.4. cooperation and training

In order to get a good skill standard, there is often a need for cooperation amongst firms. Many firm owners ask themselves whether they should invest in the skills of their employees if they risk losing them, and therefore losing their investment. This dilemna has been solved in countries where all firms tend to do a lot of training, such as Japan, Sweden or Germany, where labour markets have traditionally been tight, and it seems to have found an original solution in the Italian model of industrial districts. In order to avoid this risk and resolve this problem, firms have to join and work together, and effectively share the costs and the risks. In order to do this, they have to have a good understanding of their joint interest, in the face of bigger firms or other competitors.

In Sweden, for example, small firms apparently work together, and can therefore benefit from advantages in terms of R & D as well as of training. Although we insist more on small or medium size firms here, this is not just true for small firms, but is becoming true for larger firms as well. In the automobile sector for example, we have observed associations or networks between American and Japanese auto constructors, for example Ford and Mazda in the Detroit region, and the CAMI plant in Canada (Drache, 1994, Huxley, 1995), amongst others. The same is observed in the computer field, with the traditional enemies IBM and Macintosh even developing associations for specific objectives. Firms tend to form cooperative networks in order to do joint development and sometimes even to do joint production. This apparently confirms the increasing importance of cooperation, for small as well as for large firms. In North America and in Quebec particularly, firms have not been known to develop training much, and certainly not to cooperate much in this field. We wanted to know whether this was evolving.

We asked firms whether they had had cooperation in training their workers, and the results seem to indicate some progression of cooperation in this field (Table 16). Consultants clearly dominate the scene : they are present in over 50 % of firms for training purposes. Here again, it is in the electric and electronics industry that they are most present. Other institutions that contribute to training in firms are the following (Table 16):
36 % of firms have had training given by colleges;
28 % by suppliers (but this is usually short term, on the job, training);
20 % by p rivate firms;
16 % by local school boards;
and 27 % of firms have had only internal training.

Conclusion

To conclude, while theory indicates that the improvement of economic performance comes more and more through collaboration, cooperation, and the division of labor between firms as well as within the firm, it appears that this culture of "cooperation-competitition" has not bloomed fully in Quebec. There certainly does appear to be an emergence of cooperation in various forms; business and community cooperation do appear to play a role in certain production activities;

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but this does not seeem to be the main avenue used by Quebec firms in order to innovate. This probably depends on national conditions which are often very different, and surely differ quite a lot between Quebec and Italy, but much less between Quebec and Montachusett.

However, what many identify as vital ingredients for innovation and competitiveness, that is workers' skills development, organizational and technological learning, managerial and entrepreneurial competence, public infrastructures, close cooperation and trust between the municipalities and the firms, as well as between the firms themselves, these vital ingredients do not appear to be dominant in the present industrial structure of Quebec. Maybe it is forthcoming, maybe it just does not fit the firms' culture or business environment; it is not possible to conclude on this on the basis of only this research. In the ILO report mentioned earlier, Ganne (1990) indicated that although there was a lot of interest for the theoretical model of the Italian industrial districts in France, few empirical studies had actually been done. On the basis of the existing material in 1990, it was difficult to find clear indications which might confirm the existence in France of "industrial districts" with identical or similar characteristics to those of what is now known as the "Italian model".

For the moment, our results on Quebec seem to lead to similar conclusions, that is that there are no clear indications which might confirm the existence in Quebec of something similar to the Italian "industrial districts". However there is clear indication that there exist networks between firms. The specific characteristics of these networks and the factors which might explain the specific form they take in some sectors or regions are however unclear yet. The size of firm and type of firm might be part of the explanation: firms which are actually affiliated to a multinational appear to present different networks from those of Canadian firms and Quebec firms, and SMBs (small and medium size businesses) seem also to have different networks from multinationals. The characteristics of these networks appear to be differentiated as concerns R & D cooperation and exchanges of technical or other types of information. As Ganne has indicated for France, we tend to conclude from our research that this does not diminish the interest for further empirical study of the question. On the contrary, we rather call for a renewal and opening of the analysis of what could be called "localized industrial systems" and a recognition of the fact that the social construction of factors of production in different countries is actually differentiated and cannot conform to only one model, whether it is the Italian industrial district or the Montachussets invisible factors of local development perspective. In any case however, all these theoretical developments, as well as our own empirical research do confirm the existence of a variety of factors which influenc local economic development, and particularly the development of small firms and networks in a local environment.

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[1] On the question of industrial districts, see Sengenberger, Loveman, and Piore (1990), Goodman and Bamford (1989), amongst other publications.
[2] The data for this part of the research has not been analysed separately yet, and regional comparisons still have to be conducted on a systematic basis.
[3] , cf Table 9 of original research report.
[4] Table 2 of research results.
[5] Future analysis of data, and particularly of interview content, could give more precise information on the nature of these relations (concerning questions of trust, and other qualitative dimensions of these relations).

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