Spatial agglomeration and business groups: new evidence from Italian industrial districts

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Abstract

This paper is a first attempt to analyse the relationship between spatial agglomeration and firms' organizational structures. It takes advantage of a large data set on Italian business groups that allowed us to analyse the differences in the presence and characteristics of business groups between districts and non district areas. Overall the result confirms the hypothesis that spatial agglomeration of business activities influences firms' organization. Groups are more widespread in industrial districts than in non-district areas; moreover groups in industrial districts are less diversified and more spatially concentrated than groups outside industrial districts.

Key words: business groups, industrial districts, spatial agglomeration, firm's organizational forms

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1. Introduction

Literature on industrial districts as well as other forms of spatial agglomeration of firms (clusters, *milieux innovateur*, etc.) has stressed the systemic dimension of such productive organizations[1]. In the case of industrial districts two systemic 'levels' have drawn the attention of scholars: i) the inter-firm links based on customer-supplier relationships along a production chain; ii) the 'local system', which is composed not only of firms but also of social and political institutions. From the original contribution by MARSHALL (1920) literature has identified several advantages associated with the spatial agglomeration of firms: better access to specialized resources (information, skilled workers, suppliers); complementarities among firms; better ability to generate knowledge ('learning by interacting') and to innovate; access to specialized institutions and public goods; higher efficiency due to local rivalry and peer pressure (PORTER, 1998; BOARI *et al.*, 2003).

These aspects have been widely analysed both at a theoretical and empirical level. Theoretical models of industrial districts are mainly qualitative. In these models a substantial homogeneity of firms belonging to the district is normally hypothesized, or taken for granted (BECATTINI, 1989). This assumption is also made in quantitative models of spatial agglomeration (BOSCHMA and LAMBOOY, 2002; DURANTON and PUGA, 2003). At the moment we lack theoretical treatment of the relationship between firms' characteristics and the structure and evolution of business clusters. Little is known about whether the mechanisms at the basis of agglomeration economies influence firms' characteristics and how the heterogeneity of such firms affects the structure and internal organization of business clusters and their evolution over time.

Recent empirical investigations on Italian industrial districts have stressed the increasing heterogeneity of district firms. They agree on a general tendency towards the concentration of district output in the hands of a few firms (COSSENTINO *et al.*, 1996; LAZERSON and LORENZONI, 1999). At the same time the largest firms tend to achieve a better control of the production chain tightening the relationships with their suppliers (DEI OTTATI, 1996a; CORÒ and GRANDINETTI, 2001).

One of the main and quantifiable effects of these changes should be the increase in the size of some leading firms belonging to industrial districts. The empirical evidence about this is not straightforward. This is because the organizational form normally adopted by

firms to manage the growth process is that of the business group, i.e. a set of firms legally distinct but belonging to the same owner(s). Business groups come about by both the setting up of new firms and the acquisition of established firms. Official statistics about firms refer to legal units (companies) or technical units (plants) and ignore the phenomenon of business groups.

The importance and characteristics of business groups within Italian industrial districts have already been analysed in several studies (DEI OTTATI, 1996b; BALLONI and IACOBUCCI, 1997; BRIOSCHI *et al.*, 2002; IACOBUCCI, 2002). Nevertheless, these studies present two main drawbacks: from an empirical point of view, they refer to specific industrial districts or regions[2]; from a theoretical point of view, they do not attempt to identify the general relationship between business grouping and the evolution of industrial districts.

This paper tries to overcome these drawbacks. From an empirical point of view, it takes advantage of a large data set on business groups recently elaborated by ISTAT (the Italian Statistical Agency). The data set, referring to 2001, covers all the manufacturing firms organized as a joint-stock company (see section 3 for details on the data set). From a theoretical point of view, it discusses the relationship between the evolution of industrial districts and business group formation and derives some propositions that can be empirically tested using the available data. The data set on business groups allows us to analyse the differences in the presence and characteristics of business groups in district and non-district areas. In other words, we are able to empirically identify the potential impact of spatial agglomeration on some 'observed' characteristics of firms' organization. Descriptive statistics as well as statistical tests are used to put forward our empirical investigation.

Overall the result confirms the hypothesis that spatial agglomeration influences the organizational forms of firms. Groups are more widespread in industrial districts than in non-district areas; moreover groups in industrial districts are less diversified and more spatially concentrated than groups outside industrial districts.

The paper is organized as follows. Section two reviews the existing literature on the evolution of industrial districts and its relationship with firm organization. Section three discusses the definitions used to empirically identify business groups and industrial districts and describes the data set used for the quantitative analysis. Section four illustrates the main empirical results. Finally, section five draws the conclusions.

2. Business groups and industrial districts

In this section we first review existing literature on the evolution of industrial districts and its relationships with firms' organization. On the basis of this literature we then formulate the theoretical propositions that will be empirically tested in section four.

2.1 The background literature

Recent literature has shown that the phenomenon of business groups is not specific to large firms as it is widely spread even among small and medium sized firms (ROSA and SCOTT, 1997; LOISEAU, 2001; CHABANAS, 2002; IACOBUCCI, 2002). Indeed, from available statistics it can be affirmed that the formation of a business group is the normal way through which small firms grow.

Until a few years ago there were only a small number of studies analysing the presence and characteristics of business groups in industrial districts (BIANCHI and GUALTIERI, 1990; BRUSCO *et al.*, 1996; DEI OTTATI, 1996c; NUTI and CAINELLI, 1996). In these papers the presence of business groups in industrial districts is associated with two changes observed in this particular spatial agglomeration of firms: i) the increasing concentration of output in the leading firms; ii) the increasing control of the production chain by the same firms, achieved both by internalizing activities along the production chain and by controlling the main suppliers.

From the point of view of our study, these papers present two main drawbacks. From an empirical point of view, they generally refer to specific industrial districts or regions. For this reason it is difficult to assess to what extent their results can be generalized. From a theoretical point of view, they do not analyse the relationship between the characteristics of industrial districts and the presence and features of business groups. Nor are these features compared with those of similar groups outside industrial districts. The increasing relevance of business groups in district areas is seen as a result of a concentration process in the output of the industrial district (BRUSCO *et al.*, 1996; LAZERSON and LORENZONI, 1999), or as a result of the tendency to control the production chain (NUTI and CAINELLI, 1996), or both (DEI OTTATI, 1996c). Indeed the changing in governance structures within industrial districts and the emergence of leading firms is considered a general trend of Italian industrial districts (WHITFORD, 2001; CAINELLI and ZOBOLI, 2004).

A few recent papers have tried to systematically analyse the relationship between industrial districts and business groups, also taking into account the characteristics of the latter. BALLONI and IACOBUCCI (1997) analyse the characteristics of the main groups in the industrial districts of the Marche region. BRIOSCHI et al. (2002) analyse the presence and characteristics of business groups in the main districts of Emilia Romagna. As in the abovementioned studies the latter also refer to specific areas, although they show an explicit interest in analysing the characteristics of business groups, their role within the district and their evolution over time. Specifically BRIOSCHI et al. (2002) hypothesize that the presence and characteristics of business groups is influenced by their belonging to an industrial district. For example, the acquisition of other firms within the district should be facilitated by the familiarity of firms within the same district.

Although the latter contributions directly address the relationship between the presence of business groups and the characteristics and evolution of industrial districts, they fail to identify a general framework for the possible relationship between firms' organization and their belonging to a business cluster. Of course, the causal relationships can work in both directions. On the one hand, the characteristics of the cluster and its internal structure can have an impact on the presence and evolution of firms' organization; on the other hand, the evolution of firms' organizational structures can modify the configuration of local systems. Most studies on the evolution of Italian industrial districts have focused their attention on the latter relationship, while little empirical and theoretical work has been done on the former[3].

The analysis of the relationships between firms' organizational forms and business clustering is closely associated with the identification of evolutionary patterns of business clusters[4]. On this issue one can imagine the following scenario. In the initial phases the systemic dimension is dominant and the firms in the system can be considered as homogeneous units, none of which is able to influence the dynamics of the system as a whole. In later phases the advantages of spatial agglomeration allow some of the firms to develop and grow; eventually these firms become predominant and are able to influence the evolution of the system.

With specific reference to industrial districts, we can imagine the following evolutionary path. At the beginning agglomeration economies are mainly propelled by sharing and matching mechanisms that allow firms to reduce production costs (DURANTON and PUGA, 2003). The competitive advantage of firms belonging to the district favours their rate of growth compared with firms outside the district. At later stages the learning

mechanisms prevail, fostering not only a higher productivity in existing technology but also innovation, upgrading and product differentiation. In turn this implies substantial modifications in the internal organization of the cluster. Quality upgrading requires a better control of the supply chain in order to secure the quality of final products; this tends to reduce vertical specialization. Quality upgrading also requires increasing investment in R&D and in the market (brand image, distribution channels); these investments are subject to relevant economies of scale. In both cases the result is an increase in the size of some, leading, firms and a rising concentration in the final output of the district.

2.2 The theoretical setting

To develop a general framework for analysing the evolutionary patterns of industrial districts and their relationship with firms' organizational structures is beyond the scope of this paper. The main aim here is to offer an initial empirical analysis of the relationships between business clustering (in our case, industrial districts) and firms' organizational forms. This is done by taking advantage of a large data set on Italian business groups.

Business groups can be considered as a specific form of control of business activities. Entrepreneurs tend to set up new companies when entering new businesses, even when the latter are closely related to the activities already controlled by the entrepreneur (IACOBUCCI and ROSA, 2001). This is true also in the case of acquisitions. For this reason the characteristics of the firms belonging to a group can be used to analyse some aspects of the growth strategies and organization of firms. Specifically, business groups allow us to identify two important aspects: i) the degree of diversification of activities controlled by the same entrepreneur (i.e. the direction of growth); ii) the spatial location of these activities.

Firms belonging to industrial districts have been observed to show a higher profitability and productivity than firms in the same sector outside industrial districts (FABIANI *et al.*, 2000) as well as a higher rate of product innovation (CAINELLI and DE LISO, 2004). At the same time, most Italian industrial districts are at later stages of development, when the learning process realized by some firms should have favoured their expansion through horizontal and vertical integration. If, as we hypothesised, the setting up of a business group is the main way through which firms attain growth, we can derive the following proposition:

Θ.1 *Controlling by sector of activity, business groups are expected to be more widespread within industrial districts than outside industrial districts.*

While the rate of growth of district firms is expected to be higher than that of firms outside the districts, this does not automatically mean that business groups within industrial districts are larger than groups outside them. Indeed, the external economies that characterize industrial districts allow smaller firms to compete with larger ones. Moreover, business groups belonging to industrial districts can rely more than other groups on an extended network of suppliers.

Information sharing on production technology and market needs, transmission of ideas and the speed of the imitative process are among the characteristic features of business clusters. They help firms belonging to a cluster (like an industrial district) to raise efficiency and to foster product innovation and growth. At the same time, knowledge spill-over in specialized activities allows firms belonging to the cluster to seize business opportunities along the production chain or in related sectors (CAINELLI and LEONCINI, 1999). For this reason we can expect firms belonging to a cluster to have a higher opportunity for growth in the same sector of specialization of the cluster. This result can also be found in models of economic geography where specialization have a negative impact on new product development (DURANTON and PUGA, 2001).

Growth can take the form of product differentiation (horizontal integration) or vertical integration. Both forms concerns activities along the production chain that characterizes the cluster. At the same time the thorough familiarity of firms within the same district should favour acquisitions among them (BRIOSCHI *et al.*, 2002). Both in the setting up of new firms and in acquiring established ones it is likely that the firms involved are located within the cluster.

The previous discussion leads to the following theoretical propositions to be empirically tested:

Θ.2 *Controlling by sector of activity, business groups belonging to industrial districts should show a higher degree of specialization than groups outside industrial districts.*

Θ.3 *Controlling by sector of activity, business groups belonging to industrial districts should have a higher spatial concentration of their activities than groups outside industrial districts.*

3. Definitions, algorithms and the dataset

In order to make an empirical test of these propositions we first need a clear-cut definition of both business groups and industrial districts. We will begin by discussing the definition and the algorithm used to identify business groups. Then we will discuss the definition and algorithms used to identify industrial districts.

3.1 Business groups: definition and statistical algorithm

As already mentioned, a business group is a set of companies legally distinct but belonging to the same owner(s). From the empirical point of view groups have been identified through control linkages between pairs of legal units. The operational guidelines indicated at European level for the identification of control for statistical purposes are the followings (EUROSTAT, 2003): i) a legal unit directly owns at least 50% plus one of the voting rights in another legal unit; ii) a legal unit owns an equal share of voting rights, with respect to other units, in another legal unit; iii) a legal unit owns, by means of other subsidiaries, at least 50% plus one of the voting rights in another legal unit; iv) a legal unit fully consolidates the balance sheet of another legal unit and no other one consolidates the same legal unit. The algorithm used to empirically identify business groups applies these operational guidelines to the shareholdings matrix thus deriving a control matrix.

The Italian Statistical Business Register on Business Groups (Archivio sui gruppi d'impresa) is built-up by integrating three different statistical sources: i.e., (i) the archive of all shareholders of non-listed companies; (ii) the archive of all shareholders of listed companies; (iii) the archive of firms' consolidated accounts. These sources are sufficient to guarantee a complete coverage of the shareholders' structure of all limited companies. Elementary information on the shareholdings coming from these three sources is integrated and chains of direct and indirect control are re-constructed by applying an algorithm. The resulting structures are the statistical business groups, reflecting concepts and definitions mentioned above.

3.2 Industrial districts: definition and algorithms

Let us now analyse the definition of industrial district. As is well known, the empirical definition of this productive system is a quite complex operation. For this reason, the literature on Italian industrial districts has devoted considerable attention to devising definitions that could be useful for the purpose of empirical research. In this regard, we adopt the definition used in the so-called Sforzi-ISTAT methodology (ISTAT, 1997). This procedure identifies 199 Italian industrial districts, starting from the information on commuting provided by the 1991 Population Census. In particular, this statistical procedure is articulated in two steps. First, it divides the national territory into 784 Local Labour Systems (LLS) on the basis of the degree of commuting that characterises each Italian municipality. These LLSs are groups of contiguous municipalities characterised by a certain degree of commuting to work. Secondly, it defines as industrial districts those LLSs which satisfy the following three requirements: (i) in the LLS the percentage of manufacturing employees compared to the total of non-agricultural ones must be higher than the national average; (ii) the LLS is specialised in one particular manufacturing industry; (iii) in the LLS the percentage of employees working in firms with less than 250 employees must be higher than the national average (ISTAT, 1997). In this way, 199 industrial districts are identified.

3.3 The data set

After this discussion on business groups and industrial district definitions we are now ready to illustrate the main characteristics of the statistical information used in our empirical investigation. The latter is in fact based on a new and original data set at the firm level built up by matching two different statistical sources: namely, (i) the Italian Business Register (ASIA – *Archivio Statistico delle Imprese Attive*) and (ii) the 2001 edition of the Italian Statistical Business Register on Business Groups (*Archivio sui gruppi d'impresa*). In particular, from the first source we draw information on all the Italian firms operating in the manufacturing industry according to geographic location, productive activity (at three digits level), and number of employees. Instead, from the Register on business groups we draw information on control links among resident businesses and – to a minor extent – among resident and non resident ones. Using the latter information, we are able to classify the manufacturing firms in our sample in three different types: (i) firms without a known

ownership structure; (ii) firms with a known ownership structure but not belonging to a business group and, finally, (iii) firms with a known ownership structure and belonging to a business group. All these data refer to the year 2001.

The resulting sample of the statistical integration of these two sources consists of 511,118 manufacturing firms (with 4,564,891 employees) of which 116,884 (with 3,151,848 employees) have a known ownership structure. Of these 26,181 firms (with 1,863,886 employees) belong to a business group. Thanks to the data drawn from ASIA on the firm's geographic location, we also have information about the membership of these firms to the 784 LLSs and, therefore, to the 199 Italian industrial districts identified with the official statistical procedure previously described.

From the two already mentioned statistical sources is also possible to identify the business groups, composed by firms belonging to the same owner(s). We have then isolated the manufacturing business groups defined according to the following two criteria: i) the group is composed of at least two productive companies, one of which is a manufacturing firm[5]; ii) the largest company of the group is a manufacturing firm. A group is characterized as belonging to a specific sector of activity according to the sector of its largest company. A manufacturing group is considered as belonging to an industrial district when the largest company is located in it and it operates in the same sector of the district.

Given these criteria we identified 9,954 manufacturing groups, 1,726 of which belong to an industrial district. The manufacturing and service firms belonging to these business groups were 35,040, with an average of 3.5 firms per group. For each business group we computed the following variables: i) the number of firms in the group; ii) the overall employees of the group; ii) a specialization index, based on the share of total employees belonging to the same sector; iii) a location index based on the share of the total employees belonging to the same LLS.

The distribution of business groups by class of employees and number of firms is shown in Table 1.

Table 1 – Manufacturing business groups by class of employees and number of companies

Class of employees	Number of companies in the group									
	2	3	4	5	6-9	10-19	20-49	50-99	>99	Total
1-9	1115	181	16	7	3					1322
10-19	1050	269	51	9	6					1385
20-49	1829	569	154	52	35	11	1			2651
50-99	960	480	200	70	64	11	4			1789
100-249	685	412	223	115	119	28	12	1		1595
250-499	172	134	106	54	109	47	6	5	1	634
500-999	64	47	36	31	77	45	14	2	2	318
> 999	35	29	21	20	50	53	34	8	10	260
Total	**5910**	**2121**	**807**	**358**	**463**	**195**	**71**	**16**	**13**	**9954**

4. The empirical evidence

Now let us illustrate our empirical findings. The first result concerns the presence of business groups within Italian industrial districts. Our evidence tends to give an empirical validation of Proposition 1, i.e. that business groups are more widespread in industrial districts than outside them. This hypothesis is generally confirmed when we consider the firms (columns 1 and 2 of Table 2 and 3), but not always when we consider the share of employees (columns 3 and 4 of Table 2 and 4). In particular, columns 1 and 2 of Table 2 suggest that passing from non-district to district LLSs the share of firms belonging to business groups tends to increase. This finding appears to be reinforced when we take into account only firms specialized in the district sector. In fact, in this case the share of firms belonging to business groups is higher than in the two previous cases. The greater incidence of business groups within the Italian industrial districts is further confirmed by Table 3, where the analysis takes into account industrial districts by sector of activity.

Table 2 –Firms belonging to a business group: 2001

	Firms		Employees	
	(c)/(a) %	(c)/(b) %	(c)/(a) %	(c)/(b) %
Non district LLSs (585)	4.63	21.31	44.94	63.47
District LLS (199)	5.87	23.88	35.39	53.05
District LLS (only district sector) (199)	5.86	24.11	35.67	53.28

(a) All firms
(b) Firms with known ownership structure
(c) Firms belonging to a business group

Table 3 – Firms belonging to a business group (2001), % of firms

	District firms		Non-district firms	
	(c)/(a) %	(c)/(b) %	(c)/(a) %	(c)/(b) %
Food (17)	5.67	20.61	2.69	17.75
Textile and clothing (68)	5.01	21.82	3.09	17.43
Leather and footwear (28)	4.06	15.92	2.83	14.73
Furniture (39)	4.91	25.33	2.39	18.66
Mechanics (33)	7.46	25.77	5.43	22.31
Other sectors (14)	7.23	20.99	9.27	26.27

(a) All firms
(b) Firms with known ownership structure
(c) Firms belonging to a business group

Table 4 – Firms belonging to a business group (2001), % of employees

	District firms		Non-district firms	
	(c)/(a) %	(c)/(b) %	(c)/(a) %	(c)/(b) %
Food (17)	51.73	64.69	32.34	57.57
Textile and clothing (68)	29.80	49.89	28.65	50.15
Leather and footwear (28)	17.29	31.47	20.66	38.36
Furniture (39)	41.54	61.14	25.30	49.00
Mechanics (33)	42.19	57.36	40.77	57.46
Other sectors (14)	36.36	50.43	51.60	64.72

(a) All firms
(b) Firms with known ownership structure
(c) Firms belonging to a business group

It is worth noting that, for the aim of our study, the higher presence of groups when measured in terms of firms is more significant than when measured in terms of employees. Indeed, this difference means that in industrial districts the group form is more widespread

among smaller firms, while outside industrial districts the presence of the groups is more dependent on the size of the firm. This confirms the hypothesis that firms in industrial districts (even the smaller ones) are favoured in seizing new business opportunities, both by setting up new firms or by acquiring established ones.

According to Proposition 2 groups in industrial districts should have a lower degree of diversification than business groups outside industrial districts. To verify this proposition we calculated an index of the degree of specialization of groups, defined as the ratio of the overall employees of the group that belong to the same sector of the largest company (that in the case of district groups is the same of the district sector). Though this is not a proper index of diversification, it is appropriate to the hypothesis investigated: i.e. that groups in industrial districts tend to expand their activities in the sector characterising the district. To test this hypothesis we calculated t-tests of means differences between district and non-district groups.

The data confirm this hypothesis (Table 5)[6]. As expected, the degree of diversification of groups is very low, both for district and non district groups. Indeed, several studies have demonstrated that firms tend to diversify in activities that show a high degree of coherence (synergy) with existing activities (TEECE *et al.*, 1994). This is even more valid for the groups examined as for the most part they are composed of small firms. Nevertheless the degree of specialization of groups located in industrial districts is significantly higher than that of groups located outside industrial districts, thus confirming the hypothesis suggested by BRIOSCHI *et al.* (2002) of the prevalence in industrial districts of a specific type of business groups that they define as a "district group".

Table 5 – Degree of specialization of business groups

	District Groups		Non-district groups		Test of diff. of means	
	N. of groups	Degree of spec.	N. of groups	Degree Of spec.	t	Sig. (1 tail)
Food (17)	46	.89	685	.87	.48	.316
Textile and clothing (68)	477	.92	545	.89	3.08***	.001
Leather and footwear (28)	141	.93	178	.89	2.82***	.003
Furniture (39)	39	.89	82	.83	1.76**	.040
Mechanics (33)	826	.92	3329	.90	3.43***	.001
Other sectors (14)	197	.91	2516	.88	2.59***	.005

*** significant at 1%, ** significant at 5%, * significant at 10%

Proposition 3 suggests that groups located in industrial districts should tend to expand within the same district area, both when setting up or acquiring new companies. To verify

this hypothesis we calculated a simple index of spatial concentration, defined as the ratio of the overall employees of the group belonging to companies located in the same LLS. We expect this ratio to be significantly higher in district groups than in non-district groups.

The degree of spatial concentration is very high for both types of groups. Also in this case it is due to the large number of small groups, whose companies are mainly located around the largest one. With the exception of the food groups the share of employees within the same LLS is higher in district groups than in non-district group. Nevertheless the difference between the mean values is statistically significant only for business groups belonging to textile and clothing districts (Table 6).

Table 6 – Degree of spatial concentration of activities of business groups

	District groups		Non-district groups		Test of diff. of means	
	N. of groups	Spatial concent.	N. of groups	Spatial concent.	t	Sig. (1 tail)
Food (17)	46	.87	685	.90	-1.51	.066
Textile and clothing (68)	477	.94	545	.91	2.88***	.002
Leather and footwear (28)	141	.94	178	.93	.71	.241
Furniture (39)	39	.96	82	.92	1.52*	.065
Mechanics (33)	826	.92	3329	.91	1.05	.148
Other sectors (14)	197	.92	2516	.92	.19	.424

*** significant at 1%, ** significant at 5%, * significant at 10%

Joint consideration of the results obtained comparing the specialization and spatial concentration between district and non-district groups suggests the following conclusion. The higher degree of information sharing within industrial districts, and the associated easiness in seizing business opportunities, has more influence on the sectoral specialization of firms than on the spatial location of their activities.

The result concerning the spatial concentration of activities could also be attributed to limitations in the data we used to measure it. A first limitation in the data regards the fact that employees in foreign companies are not considered. Previous studies, taking into consideration the growth patterns of business groups demonstrated that when groups set up new firms outside their original LLS it is more likely to be in foreign countries rather than in other Italian LLS (BALLONI and IACOBUCCI, 2001). Some preliminary evidence tends to suggest that the propensity for internationalization is lower for firms in industrial districts than for firms outside industrial districts (MARIOTTI and MUTINELLI, 2004).

5. Conclusions

The main aim of this paper was to provide a preliminary analysis of the relationship between business clustering and firms' organizational structures.

Despite the importance of this issue for understanding the evolution of business clusters, and industrial districts in particular, very few theoretical and empirical studies have so far addressed the subject. This is partly because of difficulty in obtaining the necessary data. Our work is mainly empirical. We have taken advantage of a large dataset recently elaborated by ISTAT (the Italian national statistics agency) containing information about Italian business groups.

The analysis of business groups is specifically interesting for the aim of this study because business groups can be considered as a specific observed form of firms' organization. Specifically, data on business groups allow us to observe the degree of diversification of controlled activities and the spatial location of the same activities.

The review of the literature on the issue allowed us to set a few general propositions about the relationship between the presence and characteristics of business groups and their belonging or not to a specialized cluster (in our case an industrial district). In particular we tried to verify three main hypotheses: i) that the presence of business groups is more widespread in industrial districts than in non-district areas; ii) that business groups located in industrial districts are less diversified than groups outside industrial districts; c) that groups in industrial districts should show a higher degree of spatial concentration than groups outside industrial districts.

The first two hypotheses are confirmed by the empirical analysis, while the third is only verified for the case of industrial districts operating in the textile and clothing sector. The latter finding does not come as a surprise because, as the literature on industrial district suggests, agglomerative forces seem to play a major and more intense role within these 'traditional' clusters.

Being a preliminary study on the issue it has several drawbacks that give space for further development of the analysis both at theoretical and empirical level. At a theoretical level we need to develop a general model of the relationship between business clustering and firms' organizational forms. This model should take into account the evolutionary pattern of business clusters and the role played by the learning process of firms belonging to the clusters.

From an empirical point of view we are convinced that the analysis of business groups can be very fruitful for providing better insights into the relationships between spatial agglomeration and firm's organizational forms.

Notes

[1] From now on we will use the term 'business cluster' as a general label for the various forms of spatial agglomeration of firms. The term 'industrial district' will be used to refer to the particular form of business cluster prevailing in Italy, which is characterized by the importance of small firms, the high level of specialization along the production chain and the prevalence of traditional sectors.

[2] Dei Ottati (1996a) refers to industrial districts in Tuscany. Balloni and Iacobucci (1997) analyse industrial districts in the Marche region. Brioschi *et al.* (2002) analyse industrial districts in Emilia Romagna.

[3] Varaldo & Ferrucci (2004) analyse the evolution of some institutional features of district firms (like, ownership, management structure, etc.). However, they do not relate such features to the specific characteristics of business clustering.

[4] Theoretical models of the evolution of business clusters have concentrated on the conditions that explain the presence and absolute size of clusters rather than on their internal organization (see Maggioni (2004) for an application of these models to industrial districts). As mentioned in the introduction, these models normally assume homogeneity in the firms forming the cluster.

[5] We eliminated all the groups composed of just two companies, one of which is a financial or a property company. We considered these groups as 'pseudo-groups'.

[6] This result is robust to different definitions of the sector. It also holds defining the sector on the basis of a two-digit and a three-digit code.

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