THE PRESENT STATE OF RESEARCH INTO INDUSTRIAL CLUSTERS AND DISTRICTS. CONTENT ANALYSIS OF MATERIAL PUBLISHED 1997-2006

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ABSTRACT

In recent years, researchers around the world have shown a growing interest in companies operating in the same industrial sector located within geographic areas, and this in turn has sparked a scientific debate on whether the existence of territory-based production methods is a source of company wealth. The lack of previous literature reviews on the subject, which would reveal the key questions to be studied, has, however, led us to analyse the contents of academic texts published between 1997 and 2006 in major international scientific journals. Accordingly, selected works were studied from three angles: the evolution of their scientific quality, the lines of research to which they are linked, and the methodology employed. This enabled us to determine the present level of development and to propose lines for future research.

Key words: Industrial district, cluster, territory, inter-organisational networks, content analysis.

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1. Introduction

The process of globalisation in which economies are presently developing is leading to an increase in the importance of economies of scale and production specialisation. Although traditionally this process has been contemplated from the point of view of large companies, in recent decades, different researchers have highlighted the existence of other important factors which are external to individual companies, but seem to affect groups of companies within a geographical area. Because of this, attention to companies located in limited geographical areas has grown, with special emphasis placed on the superiority of this type of industrial organisation over mass production and the vertically integrated company (Piore and Sabel, 1984; Best, 1990). Authors generally suggest that territorial agglomerations benefit companies due to a series of external factors involving non-commercial interdependencies (Storper, 1992). These authors come from a variety of backgrounds including geography (Krugman, 1991; Lundvall, 1992), economic policy (Piore and Sabel, 1984; Best, 1990; Digiovanna, 1996; Mistri, 1999; Boix and Galletto, 2008), sociology (Saxenian, 1994; Lazerson, 1995) or strategy (Porter, 1990; Enright, 1995).

In fact, the phenomenon of globalisation and proliferation of trans-national companies has produced a contradictory and paradoxical reaction. On the one hand, we find the existence of extensive networks that are mostly of a financial nature, lacking national or territorial ties. On the other hand, this same phenomenon has been seen to reinforce the importance of the national or regional bases of companies. The paradox of globalisation lies in the fact that while competition becomes increasingly global, business and industrial localisation is ever more restricted to certain areas.

As a result of this interest, an enormous variety of concepts accounting for the phenomenon have been developed, including *Milieux Innovateurs* (Aydalot, 1986); *Flexible Specialisation* (Piore and Sabel, 1984); *Production System* (Storper and Harrison, 1991); *Industrial Cluster*

(Porter, 1990; Enright, 1995), *National Innovation System* (Lundvall, 1992), *Hot Spot* (Pouder and St. John, 1996) or *Industrial District*, initially proposed by Marshall (1925) and later developed by Becattini (1979, 1987, 1989, 1990) and a great number of economists and sociologists (Sforzi, 1990; Triglia, 1990; Brusco, 1990; Bellandi, 1992).

However, as Storper and Harrison (1991) comment, such a large number of concepts and approaches produces confusion and make it more difficult to understand the phenomenon. Yet, in spite of these problems, the scientists who have contributed most to the development of these studies at an international level are geographers and economists (Salom, 2005). In all these cases reference is made to an economic resurgence related to local characteristics (which are specific to the place), which allows them to compete in a global context (Méndez and Caravaca, 1997; North, 1998; Rama and Calatrava, 2002; Vázquez-Barquero and Alfonso-Gil, 2002).

One of the decisive elements for the success of these areas is their capacity to generate, adopt and divulge innovation. In the present economic context, in which competition is price-based, innovation is often substituted by improved dynamics, a crucial endogenous determinant for economic growth and the adaptation of companies to the territory (Malmberg and Maskell, 2002).

In recent years there has been a noticeable increase in research dealing with regional development as well as technological research and development themes, with many contributions on the theme of innovation and technology in regional development (Salom, 2005). One major difference from past periods, when attention was centred on technology-based company innovation and territorial aspects played merely a supporting role or represented simply the scenario where events took place, is that we now understand that this capacity for innovation, which allows efficient use by individual companies of the existing resources in a particular field, is also capable of producing a geographical hotspot that favours

development (Mendez and Caravaca, 1997). Companies are no longer considered to be isolated innovative agents, but rather part of a medium with a particular innovative capability which makes it essential to analyse relationships between companies in the same area and to study the organisational methods and habits that characterise them. Hence, the environment helps to encourage socioeconomic dynamism and, in the global logic of networks, allows specific spaces to be determined as fast developing or emerging (Mendez and Caravaca, 1997).

However, in spite of the attention that the subject deserves, up to now no reference framework has been developed to clearly outline the current state of academic research published in the international literature on these areas of local and regional development, which tend mainly to be characterized within the concepts of industrial districts and territorial clusters. Twenty-five years after the appearance of the seminal paper by Professor Giacomo Becattini in the *Revista di Economia e Politica Industriale*, the notion of territorial agglomerations of companies has permeated both the theoretical field of analysis of development and actual industrial policy (Soler, 2006). Bearing both this and the aforementioned gap in research in mind, the main aim of the present paper is to perform a detailed review of recent contributions to scientific journals on this perspective through content analysis. This analysis technique allows us to study in greater depth the state of academic research on the mechanisms of collaboration between companies in territorial agglomerations in the period 1997-2006. Accordingly, selected works were studied from three angles: the evolution of their scientific quality, the lines of research to which they are linked, and the methodology employed. Findings from this work will allow us to understand the present level of development in this field of research, which deals with the horizontal relationships between companies within a territory.

This work is structured as follows: first, we present the methodology used to perform the content analysis. The main results of the study are then outlined and finally the general

conclusions of the work (centred on the gaps that were identified), the most significant findings and the way forward for further research are all presented.

2. Research Methodology

Reviewing published research material on a specific theme constitutes one of the main ways of evaluating its methodological content. *Content analysis* of works published in academic journals allows us to evaluate the scientific development of a discipline, ascertain the direction and tendencies of research in that field, and understand the mechanisms determining the quality of research publications as an adequate way to direct the work of researchers.

A review of the work published on content analysis shows that two main methods can be used. The first is *direct identification*, which involves describing the theme or area of the research and the profile of the work by looking at the objectives, methodology and results. This type of work appears quite frequently because the editorial advice in journals usually expresses an interest in evaluating the characteristics of the publications on a regular basis. The second method is *indirect identification*, which consists of analysing how knowledge is passed from one publication to another. It is a procedure that, rather than tackling the concepts used, in fact analyses the structure of references to other publications, thereby enabling us to find out how one discipline interacts with others.

The work presented here uses content analysis through direct identification to review international research in a field of wide academic and business interest, i.e. the territorial agglomeration of companies. The literature review covers the 10-year period between 1997 and 2006, a timescale that is wide enough to be able to provide reliable research trends. The lack of previous work on the subject in general makes it recommendable to use this kind of study and timescale. As regards methodology, our work will be based on Kolbe and Burnett

(1991), Alfaro et al. (2002) and Sachan and Datta (2002) to analyse the scientific quality and methodology used.

Content analysis begins with the selection of the information sources to be used, although there is far from unanimous agreement about how to go about source selection for this type of study. While some authors include only academic journals, others include conference papers and other publications. We chose only academic journals, since we believe that papers presented at congresses and doctoral theses generally end up being published in journals at a later stage.

The second step is to choose which journals to examine. Because of the lack of academic journals that deal specifically with the theme under consideration here, we chose periodicals which were likely to include works on the theme from two international databases that are widely recognised for their quality by the scientific and academic community. Thus, journals indexed in the *Journal Citation Report (JCR)* and in *Scimago Journal & Country Rank (SJR)* were analysed. Finally, the following categories were chosen for analysis: Economics, Planning & Development, Urban Studies, Environmental Studies, Business, Management and Geography, for the JCR; and Business, Management and Accounting, Geography, Planning and Development, for the SJR. We understand that the journals chosen contain a wide, and thus representative, sample of research on the territorial agglomeration of companies. However, we also realise that including or failure to include a particular journal could become a subject for discussion.

The third step is to choose the papers that are likely to contain material that is relevant to the theme under study[1]. This is achieved by searching for a series of keywords that should appear in the title and the abstract of the article. In this particular case the following keywords were used: industrial district, cluster, agglomerations, local productive systems, territory, research networks, and social capital. In this way we obtained a database made up of 142 papers (listed

in the Appendix) and whose source publications can be seen in Table 1. Research articles came from 43 different sources over the period 1997-2006.

INSERT TABLE 1 ABOUT HERE

On concluding this work, each article was analysed in greater depth by means of a data file which included the following information: year of publication, authors, type of work, sources used, information type, timescale and geographical location, statistical techniques used, application sector and line of research.

From the data gathered from this review, first a general analysis of the scientific characteristics of the selected articles was carried out and we then went on to analyse the lines of research followed in each publication. Several statistical methods were used to determine when the differences among the different variables are statistically significant, as well as to examine the evolution of some of the more important variables over time. The F test was used to examine continuous variables, while the $\Phi 2$ and Cramer's V tests were used for nominal data.

3. Analysis of Results

In the following sections we will present the most significant results of the content analysis carried out on the works in our database.

3.1 *Evolution of the scientific quality of the works*

Two indicators were used to measure the evolution of the scientific quality of the works: the number of empirical versus conceptual works, and the number of statistical techniques used in each work to support the empirical part (Table 2).

The first manifestation of the scientific quality of a work will be that it includes some form of empirical research, since the existence of a consolidated theoretical foundation can be used

empirically contrasted with other contexts and situations. As a result of this, we could therefore expect the number of empirical works to increase over time, as the data available for comparison accumulates. The results show that, for the period studied, there were far more empirical studies than conceptual ones (71% against 29%, respectively), with no significant differences detected from year to year (Cramer's $V = 0.161$, Sig. $= 0.932$). This result would be indicative of the existence of a theoretical foundation on the subject of territorially agglomerated companies that has become consolidated over the years, which is why research is largely empirical.

INSERT TABLE 2 ABOUT HERE

Secondly, we consider that the more statistical techniques are used in empirical works, the more sophisticated the research is, which could in turn indicate a positive evolution in the scientific quality of the discipline. The average number of techniques per article is 0.82, which increases only slightly over the time period in question (Fig. 1), with no statistically significant differences from year to year ($F = 0.696$, Sig. $= 0.711$); from such findings it can be deduced that there is a fairly low level of sophistication in research on the theme analysed.

INSERT FIGURE 1 ABOUT HERE

3.2 *Lines of Research*

We also wanted to examine the lines of research detected in the study of territorial agglomerations of companies. Taking previously works as our starting point, we tried to identify different topics, trends, plans, etc., and this finally led us to propose five lines of research (see Table 3), which were validated by sending them to a panel of experts. We were thus able to classify the 142 articles (which was the aim of this research) so that they could be

analysed later in greater depth in order to detect the existence of gaps which would provide future lines of research. Each article was assigned to a line of research by peers (interraters).

INSERT TABLE 3 ABOUT HERE

Hence, the first line of research proposed and identified as CHARACTERISATION includes articles on the subject and, more specifically, articles that include literature reviews, as well as showing classifications, taxonomies and reflections on the territorial agglomeration of companies. This block contains mainly conceptual articles that attempt to identify these factors, in many cases supported by statistics to describe the relationships within a sector. We also included articles which model relationships but without any empirical work to support them. There are 72 articles in our database that study the different approaches that can be used to analyse territorial clusters or districts, together with the Theory of Social Capital or the Theory of Resources and other similar theories that validate their existence.

The second line of research, LIFE CYCLE, includes works that analyse the creation of clusters or districts or their transformation (relocation of activities, internationalisation of companies, tertiary impact, spin-offs, poly-specialisation, etc.). Content analysis provided 13 articles in this category.

Thirdly, PERFORMANCE is a line of research which includes all those works dealing with the performance of companies belonging to the districts/clusters from an internal point of view (competitiveness, results, innovation, etc.), as well as those that make *inside-outside*-type comparisons between districts and clusters. We identified 34 works in this group.

The fourth group, POLICIES, includes works that refer to the government-level policies implemented in clusters or districts, as well as the influence that the different local institutions have on them. We found 10 articles in this category.

Lastly, in SPECIFIC REALITIES, we include articles that study very specific cases of industrial agglomerations in a certain geographic area such as technological districts, for example. We detected 13 articles in this block.

Table 4 shows a detailed list of the works analysed according to the lines of research they belong to[2]. The results show that more than half the works we found belong to CHARACTERISATION (50.7% of the total), followed by the PERFORMANCE line with nearly 24% of the works, while the other three categories account for less than 10% each.

INSERT TABLE 4 ABOUT HERE

Once the content of the lines of research has been analysed, we then establish how it evolves over time. Thus the lines can be expected to vary with time, with differences between years that can generally be explained by the themes chosen in the research. The results (Table 5) show that 74.64% of the works analysed fall into either the CHARACTERISATION or the PERFORMANCE categories and show a significant link between the line and time variables (Cramer's $V = 0.301$, Sig. $= 0.046$). In Figure 2 we can see how all the lines increase except for that of SPECIFIC REALITIES, which decreases slightly over the years, while CHARACTERISATION evolves continuously.

INSERT TABLE 5 ABOUT HERE

INSERT FIGURE 2 ABOUT HERE

3.3 *Methodology and characteristics of the work by lines of research*

The last point to be considered concerns the methodology of the research works, which involves analysing whether or not there is a relationship between the lines of investigation and the methods employed to conduct the research. This is achieved by looking at the main

aspects such as the type of work, information sources, type of information, timescale and geographical scope, type of research, statistical techniques and sector of activity.

Results obtained according to lines of research (Table 6) show that, first, there is a significant correlation between the *type of work* and the line of research ($\Phi 2 = 0.327$, Sig. = 0.004). As expected, there is a vast predominance of empirical work in the studies analysed both overall and for each of the lines of research, although relatively high percentages of conceptual works were detected in the CHARACTERISATION and POLICIES lines, which is totally coherent with the definition of these lines.

Secondly, it can be said that, in global terms, the use of *secondary sources* of information (59.2%) is more frequent than *primary* ones (40.8%) in empirical works. Consequently, we also find this characterisation in the lines considered, the only exception being the LIFE CYCLE line of research, in which works using primary information sources predominate. Hence, we can see that there are significant differences depending on the line of research followed in the works (Cramer's V = 0.229, Sig. = 0.034).

INSERT TABLE 6 ABOUT HERE

As far as the *quantitative or qualitative nature* of the information in the empirical works is concerned, the notable point is the equality that exists between the use of qualitative (50.38%) and quantitative information (49.62%) overall. In contrast, we find significant differences as regards the lines of research analysed (Cramer's V = 0.313, Sig. = 0.000). In the CHARACTERISATION, LIFE CYCLE and POLICIES categories, qualitative works predominate, while in the PERFORMANCE and SPECIFIC REALITIES lines the works tend to use quantitative information.

As regards the *type of objectiv*e of the research in the empirical (descriptive or explanatory-predictive) works, Table 6 again shows a balance between descriptive (51.49%) and

explanatory-predictive works (48.51%) at a global level. If we break this down into lines of research, however, it can be seen that there are significant statistical differences depending on the line of research considered (Cramer's V = 0.297, Sig. = 0.002). In the lines CHARACTERISATION, LIFE CYCLE and SPECIFIC REALITIES descriptive objectives predominate, while in PERFORMANCE there is a predominance of explanatory-predictive ones and in POLICIES we find 50% of each.

In general terms, the *timeframe* in which the research is conducted is mostly transversal (54.46% of the works) and fewer research works adopt a longitudinal or dynamic perspective (45.54%). There are also significant statistical differences between the lines (Cramer's V = 0.347, Sig. = 0.000). Transversal works predominate in CHARACTERISATION and PERFORMANCE, while longitudinal works are more frequent in LIFE CYCLE, POLICIES and SPECIFIC REALITIES.

The *geographical scope* of the research is mainly local (53.47%), as opposed to 28.71% national and only 17.82% international. Analysis by lines of research does not yield any significant differences at a 95% confidence rate, but some were detected at 90% (Cramer's V = 0.221, Sig. = 0.053).

INSERT TABLE 6 (BIS) ABOUT HERE

As far as the *type of research* used in the works (Table 6Bis) is concerned, the most common are studies from archives (35.16%), literature reviews (17.58%), interviews (16.48%) and surveys (15.38%). We can see that there are no statistically significant differences according to the lines of research followed in the works (Cramer's V = 0.225, Sig. = 0.248).

With respect to the *statistical techniques* (Table 6Bis), the most commonly used methods in the works are descriptive statistics (56.90%) and regression analysis (11.21%), while the least frequently employed are discriminant analysis and time series, with percentages under 1%.

The results indicate that there is no significant correlation between the subjects or lines of research and the statistical techniques that were used (Cramer's V = 0.352, Sig. = 0.085).

Lastly, analysis of the *activity sectors* used in the works (Table 6Bis) shows us that, globally, most of the works are focused mainly on the technology (22.54%) and textiles/footwear sectors (17.61%), with no statistically significant correlation between research topics and activity sectors (Cramer's V = 0.241, Sig. = 0.607).

4. Conclusions and Discussion

Here we have tried to provide an initial diagnosis of the state of research on the territorial agglomeration of companies over the period 1997-2006. After reviewing a database of 142 works from 43 international scientific journals and analysing the information extracted from each of them, we can highlight the following conclusions:

4.1 *Identified gaps*

The main gaps were identified as being due to the differences between the works in our database and the proposed lines of research that were detected by our analysis[3].

1. Hence, there are more works in the CHARACTERISATION line, which includes descriptions and classifications of the theories that currently exist on the territorial agglomeration of companies. However, a deeper analysis of this first line shows that there is a shortage of conceptual works that propose research agendas or trends in the study of the horizontal relationships between companies in industrial districts or territorial clusters in the same way as vertical relationships between companies are analysed in work with an international scope.

2. The second line, LIFE CYCLE, covers works dealing with different internal and external factors that have an influence on the creation and development of clusters and industrial districts. However, this is nearly always carried out on an empirical level

and consists in analysing particular cases. In this sense, there is an obvious lack of conceptual works that put forward a general model for these life cycles that allows us to generalise on how the factors can affect the development and functioning of territorial agglomerations of companies.

3. The third line, PERFORMANCE, is the second largest group of articles in which research is conducted mainly from an empirical point of view with fundamentally explanatory-predictive objectives. We have, however, detected a lack of works centred on the analysis of models of cluster or industrial district performance with a longitudinal timeframe that shows their evolution over time.

4. The fourth group, POLICIES, includes works that refer to the government-level policies implemented in clusters or districts, while also focusing on the influence of the different local institutions. Qualitative works are far more common than quantitative ones, which means that it could be interesting to research further into the quantitative effects of the policies applied in territorial agglomerations of companies.

5. Lastly, the SPECIFIC REALITIES field is the one that can provide the most opportunities for further future research (as we found few works in the journals). It is also the one where, up to now, a great deal of effort has been made to describe particular cases, but there are very few suggestions for future proposal for models that can be used to explain these realities or how they work.

4.2 *Significant findings*

The main findings derive from the analysis of the works as regards their scientific quality, the existence and evolution of lines of research and the methodology employed in them.

1. Although there does not seem to be a clear evolution of the scientific quality of the works over time, we did detect a predominance of empirical works over conceptual ones in the last few years, which indicates the existence of a consolidated theoretical

foundation concerning territorial agglomerations of companies. On the other hand, the number of statistical techniques has grown slightly over time but without any noticeable statistically significant differences from year to year. This finding could indicate that time, rather than the number of techniques, is the best indicator of the scientific rigour of an investigation. Moreover, it is important to highlight the predominance of statistically descriptive techniques in the works analysed.

2. There is an especially significant evolution in the themes dealt with over time, and so we can conclude that there could be manifest trends or modes in the lines of research considered. Above all, there is a clear upward trend in the works in all the lines analysed except that of SPECIFIC REALITIES, which descends slightly while the CHARACTERISATION line develops at a steady rate.

3. Lastly, there is a significant relationship between the line of research of the works and the following methodological variables: type of work, type of information, type of objective and timeframe. In contrast, no significant relationship was found between the research topics and the following methodological variables: geographical scope, type of research, statistical techniques and sector analysed.

4.3 *Future research directions*

Our research proposals are divided into various sections:

1. First, we would like to point out that, in accordance with the gaps that were identified, there are topics that have not yet been studied or that have been analysed to a certain extent but could be the object of future research on territorial agglomerations of companies.

2. Most works focused on studying "which" kind of relationship and structure take place in territorial agglomerations of companies. However, we understand that to reach greater maturity in research it would be interesting to study "how" and "why" these

relationships and structures are produced between organisations in the same district or cluster, as proposed by Sacha and Datta (2002) in their work on vertical relationships between companies.

3. Most of the selected works are locally based. However, globalisation strategies in companies include both horizontal and vertical relationships with other companies in any part of the world, and so we conclude that this is an opportunity to study more complex chains and networks.

4. It is important to highlight that we have based our work on the analysis of horizontal relationships in districts and clusters, but we are aware of the strategic importance of other types of vertical relationships. Consequently, our future research will be aimed at completing the study of inter-organisational relationships, including an analysis of the major international publications on vertical relationships among companies within the same territorial agglomeration. Finally, we would like to underline the fact that this study does not claim to be anything more than a first exploratory step to be extended later by looking deeper into the themes of vertical and horizontal relationships among companies within the same geographical area.

Notes

1. Analyses of brief notes, editorials, professional commentaries and book reviews, which are often to be seen in journals, have not been included in the study.

2. The authors are aware that relationships may exist between the different lines proposed here and so the articles can be classified according to more than one line of research. The task of analyzing the lines in each article with the greatest possible precision was carried out by assigning a single main line to different judges.

3. In view of the intermingled relationships between some of the proposed lines, the gaps identified in some lines could be applied to others.

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APPENDIX: Analyzed Works

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Table 1. Selected publications and papers

Journal	Number of works	%
Business Strategy Review	1	0,70%
Cambridge Journal of Economics	2	1,41%
Construction Management and Economics	1	0,70%
Economic Development Quarterly	1	0,70%
Entrepreneurship & Regional Development	13	9,15%
Environment and Planning	1	0,70%
European Planning Studies	35	24,65%
European Urban and Regional Studies	1	0,70%
Facilities	1	0,70%
Growth and Change	1	0,70%
Human Systems Management	2	1,41%
Industrial and Corporate Change	4	2,82%
Industry and Innovation	2	1,41%
Int. Studies of Mgt. & Org	5	3,52%
International Journal of Emerging Markets	1	0,70%
International Journal of Entrepreneurial Behaviour & Research	3	2,11%
International Journal of Operations & Production Management	1	0,70%
International Journal of Sociology and Social Policy	1	0,70%
International Journal of the Economics of Business	1	0,70%
International Journal of Urban and Regional Research	1	0,70%
Journal Article Excerpt	1	0,70%
Journal of Economic Geography	4	2,82%
Journal of Evolutionary Economics	2	1,41%
Journal of Intellectual Capital	2	1,41%
Journal of International Economics	1	0,70%
Journal of Knowledge Management	3	2,11%
Journal of Management and Governance	5	3,52%
Journal of Small Business and Enterprise Development	1	0,70%
Journal of Technology Transfer	2	1,41%
Journal of Urban Economics	1	0,70%
Organization Studies	1	0,70%
Oxford Development Studies	1	0,70%
R&D Management	1	0,70%
Regional Studies	16	11,27%
Research Policy	1	0,70%
Small Business Economics	5	3,52%
South African Geographical Journal	1	0,70%
Strategic Management Journal	2	1,41%
Supply Chain Management: An International Journal	1	0,70%
The Journal of Development Studies	1	0,70%
The Journal of Technology Transfer	1	0,70%
Urban Studies	9	6,34%
World Development	2	1,41%
TOTAL	**142**	**100**

Table 2. Evolution of the scientific quality of the works

		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
TOTAL	142	8	7	20	7	17	26	9	14	18	16
Work Type											
Concept	**41**	2	1	7	2	4	8	3	6	5	3
Empirical	**101**	6	6	13	5	13	18	6	8	13	13
Number of Techniques											
Average	**0,82**	0,63	0,86	0,75	1,29	0,65	0,73	1,33	0,57	0,83	1,00
Standard Deviation	**1,00**	0,74	0,69	0,85	1,80	1,00	0,92	1,58	0,94	0,92	0,89

Fig 1. Evolution of the timeframe of the number of techniques used in the works
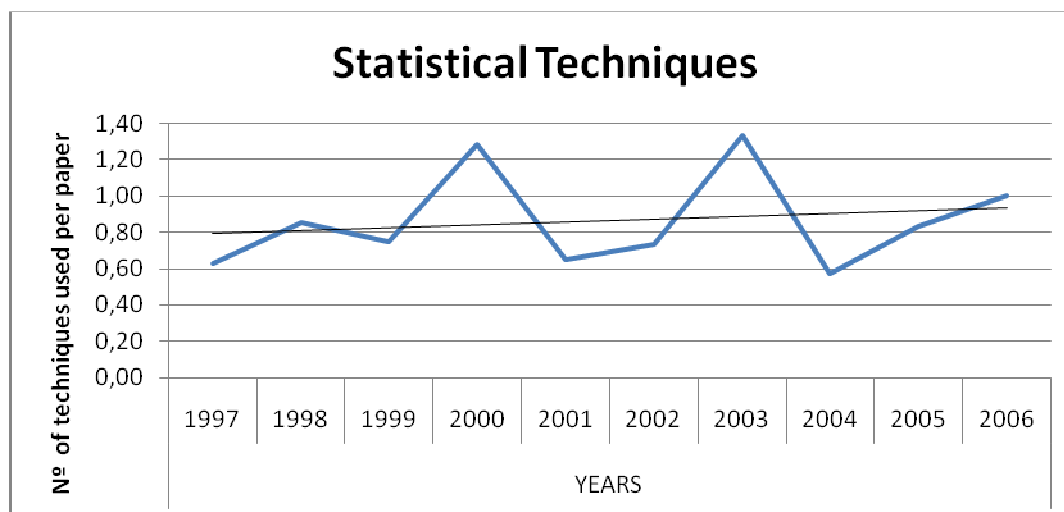
Table 3. Proposed Lines of Research

Lines of Research	Description
CHARACTERISATION	Cluster or industrial district characterisation; existence hypothesis, shared resources, social capital, district brand, etc.
LIFE CYCLE	Life cycle of the industrial districts or clusters; creation, transformation, maturity, (relocation, internationalisation, tertiary elements, spin-offs, poly-specialisation, etc.)
PERFORMANCE	Performance; at internal level, (competitiveness, results, innovation), comparison between districts, comparison with different realities (district effect, ID - large company).
POLICIES	Cluster/industrial district policies; governmental policies, impact of local institutions.
SPECIFIC REALITIES	Specific realities; technological districts, metropolitan areas, etc.

Table 4. Works revised by line of research

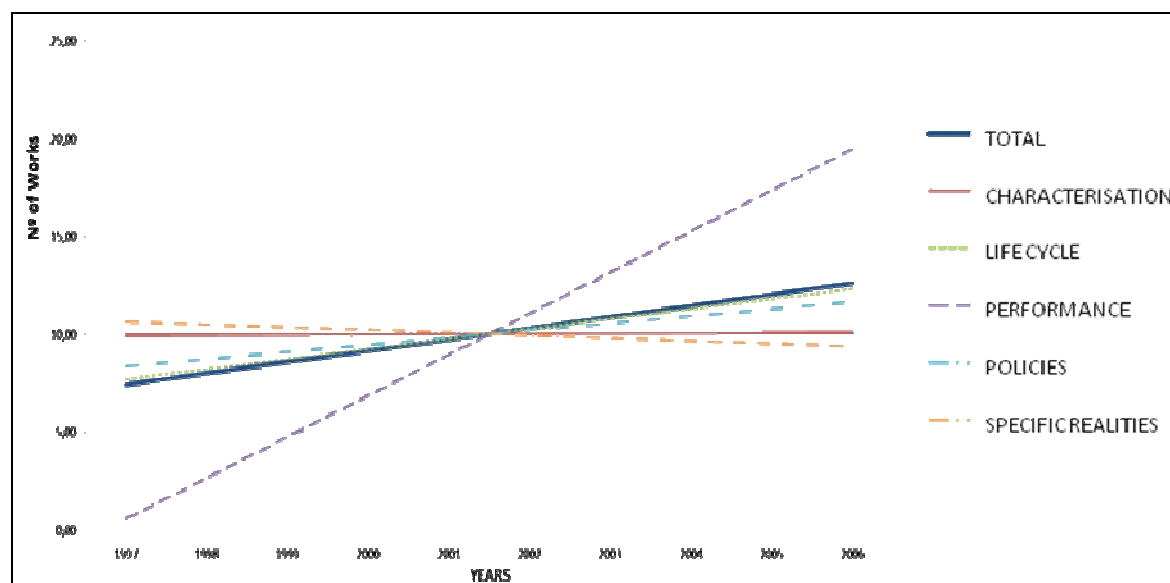| Lines of Research	Works[1]
CHARACTERISATION (72)	4, 7, 8, 10, 20, 23, 24, 25, 27, 28, 30, 33, 34, 36, 38, 41, 44, 45, 48, 49, 50, 52, 53, 55, 56, 58, 59, 60, 61, 62, 63, 64, 66, 68, 69, 70, 71, 73, 75, 77, 81, 83, 84, 85, 86, 87, 88, 90, 94, 95, 101, 102, 104, 105, 106, 109, 110, 112, 115, 118, 119, 120, 123, 124, 125, 128, 131, 133, 135, 136, 138, 141
LIFE CYCLE (13)	2, 6, 19, 39, 42, 47, 76, 79, 107, 126, 134, 139, 140
PERFORMANCE (34)	3, 5, 11, 12, 13, 15, 17, 18, 21, 22, 26, 29, 31, 32, 37, 40, 46, 67, 78, 89, 91, 97, 98, 99, 100, 108, 111, 121, 122, 127, 129, 130, 132, 142
POLICIES (10)	1, 9, 57, 65, 72, 80, 96, 103, 117, 137
SPECIFIC REALITIES (13)	14, 16, 35, 43, 51, 54, 74, 82, 92, 93, 113, 114, 116

[1] *The number assigned to the work corresponds to that in the Appendix*

Table 5. Evolution of lines of research

	Total	Evolution (% horizontal)									
		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Number of works	142	8	7	20	7	17	26	9	14	18	16
CHARACTERISATION	72	5,56	6,94	16,67	4,17	16,67	18,06	4,17	11,11	11,11	5,56
LIFE CYCLE	13	0,00	7,69	23,08	0,00	15,38	15,38	0,00	23,08	0,00	15,38
PERFORMANCE	34	8,82	0,00	2,94	5,88	2,94	17,65	8,82	5,88	17,65	29,41
POLICIES	10	10,00	0,00	10,00	10,00	0,00	20,00	30,00	10,00	10,00	0,00
S. REALITIES	13	0,00	7,69	23,08	7,69	15,38	23,08	0,00	0,00	23,08	0,00

Fig 2. Linear tendencies

Table 6. Methodology of works by line of research (% vertical)

	Total [1]	Lines of Research				
		CHARACTERISATION	LIFE CYCLE	PERFORMANCE	POLICIES	S.REALITIES
Work Type(***)	**142**	**72**	**13**	**34**	**10**	**13**
Concept	28,87	41,67	15,38	11,76	40,00	7,69
Empirical	71,13	58,33	84,62	88,24	60,00	92,31
Sources (**)	**125**	**53**	**14**	**35**	**9**	**14**
Primary	40,80	37,74	57,14	40,00	44,44	35,71
Secondary	59,20	62,26	42,86	60,00	55,56	64,29
Information Type(***)	**131**	**52**	**14**	**41**	**8**	**16**
Qualitative	50,38	63,46	57,14	34,15	75,00	31,25
Quantitative	49,62	36,54	42,86	65,85	25,00	68,75
Objective(***)	**101**	**42**	**11**	**30**	**6**	**12**
Descriptive	51,49	61,90	54,55	30,00	50,00	66,67
Explanatory-predictive	48,51	38,10	45,45	70,00	50,00	33,33
Timeframe(***)	**101**	**42**	**11**	**30**	**6**	**12**
Longitudinal	45,54	30,95	90,91	36,67	83,33	58,33
Transversal	54,46	69,05	9,09	63,33	16,67	41,67
Geographical boundaries(NS)	**101**	**42**	**11**	**30**	**6**	**12**
Local	53,47	50,00	63,64	53,33	83,33	41,67
National	28,71	30,95	27,27	30,00	16,67	25,00
International	17,82	19,05	9,09	16,67	0,00	33,33

[1] *We detected a total of 101 empirical articles. The totals exceed this amount in some cases because the variables in the study allow for simultaneous options (specifically, information sources and types).*

** p < .05; *** p < .01; NS (there are no statistically significant differences)

Table 6 (Bis). Methodology of works by lines of research (% vertical)

	Total[1]	Lines of Research				
		CHARACTERISATION	LIFE CYCLE	PERFORMANCE	POLICIES	S. REALITIES
Type of research (NS)	**182**	**93**	**16**	**41**	**15**	**17**
Questionnaires	**15,38**	9,68	12,50	29,27	13,33	17,65
Simulation	**0,00**	0,00	0,00	0,00	0,00	0,00
Interviews	**16,48**	16,13	31,25	9,76	20,00	17,65
Cases	**7,14**	8,60	6,25	4,88	6,67	5,88
Mathematical Models	**1,10**	1,08	0,00	2,44	0,00	0,00
Models	**5,49**	7,53	0,00	7,32	0,00	0,00
Other qualitative	**1,10**	1,08	0,00	0,00	6,67	0,00
Other quantitative	**0,00**	0,00	0,00	0,00	0,00	0,00
Experimentation	**0,00**	0,00	0,00	0,00	0,00	0,00
Archive	**35,16**	29,03	37,50	43,90	26,67	52,94
Observation	**0,55**	1,08	0,00	0,00	0,00	0,00
Group Dynamic	**0,00**	0,00	0,00	0,00	0,00	0,00
Literature Review	**17,58**	25,81	12,50	2,44	26,67	5,88
Content Analysis	**0,00**	0,00	0,00	0,00	0,00	0,00
Other Methodologies	**0,00**	0,00	0,00	0,00	0,00	0,00
Statistical Techniques (NS)	**116**	**37**	**9**	**49**	**6**	**15**
Stats. Description	**56,90**	56,76	66,67	46,94	66,67	80,00
Independence Trials	**6,03**	0,00	0,00	12,24	16,67	0,00
Regression	**11,21**	5,41	11,11	18,37	0,00	6,67
LOG_LIN	**1,72**	0,00	11,11	0,00	0,00	6,67
Factorial	**1,72**	5,41	0,00	0,00	0,00	0,00
Cluster	**5,17**	10,81	0,00	4,08	0,00	0,00
Discriminator	**0,86**	2,70	0,00	0,00	0,00	0,00
Correlations	**6,03**	2,70	0,00	12,24	0,00	0,00
Anova-Manova	**3,45**	0,00	0,00	4,08	16,67	6,67
Time series	**0,86**	0,00	0,00	2,04	0,00	0,00
Mathematical Develop.	**1,72**	5,41	0,00	0,00	0,00	0,00
Other techniques	**4,31**	10,81	11,11	0,00	0,00	0,00
Sector (NS)	**142**	**53**	**21**	**46**	**7**	**15**
Food	**7,04**	3,77	14,29	8,70	0,00	6,67
Ceramics	**5,63**	3,77	4,76	10,87	0,00	0,00
Textiles/Footwear	**17,61**	20,75	9,52	17,39	0,00	26,67
Furniture	**6,34**	7,55	9,52	6,52	0,00	0,00
Electronics	**2,82**	3,77	0,00	0,00	14,29	6,67
Technology	**22,54**	22,64	19,05	19,57	42,86	26,67
Automotive	**4,23**	3,77	14,29	2,17	0,00	0,00
Logistics Operators	**5,63**	3,77	4,76	4,35	14,29	13,33
Various sectors	**18,31**	18,87	9,52	19,57	28,57	20,00
Other sectors	**9,86**	11,32	14,29	10,87	0,00	0,00

[1] *We detected a total of 101 empirical articles. The totals exceed this amount in some cases because the variables in the study allow for simultaneous options (specifically information sources and types).*
NS (there are no significant statistical differences)