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Standards behaviours face to innovation of the entrepreneurships of Beira Interior

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Standards behaviours face to innovation of the entrepreneurships of Beira Interior

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ABSTRACT

Accord Aydalot (1986), the firm is no heaven-sent agent free to “choose” an environment, it is secrete by its environment. The firm is not an isolated innovative agent but is part of the milieu, which makes it act. The competitive and innovative performance of the territory, territories more or less competitive and innovative, requires persistence and participation of the different actors: companies, institutions of support and assistance to the company’s activity, public institutions.

We do not have the ambition to cover the whole different actors, but illustrate the approach that reflect the better performance innovative of the companies is associate to different factors of the environment milieu and evaluate the determinant conditions of participation in innovation activities. Our purpose is to analyse the behaviour of the companies of 3 NUTS III of Beira Interior of Portugal, relatively to the innovative initiatives. We use a survey applied to vast set of companies. The methodology is based on the application of the multivariate statistics: k-means analysis clusters that allowed distinguish 3 standard behaviours from the companies. To classify the standard behaviour of the companies and identify the characteristics of each cluster, we applied the crosstabs and compare means. We consider the fowling attributes to the different clusters: process of innovation, the mechanisms of knowledge, the networks and the system of governance. These attributes will help to trace the profile of the innovative behaviours and to perceive which the factors or variables of the environment those are links with the best performance on innovation.

1- Introduction

The competitive and innovative performance of the territory depends on the persistence and attitude of the different actors (public and private) toward promoting innovation and competitiveness. The purpose of this paper is to analyze what extent the companies of the 3 NUTS III of Beira Interior¹ (BI) (Beira Interior Norte, Beira Interior Sul and Cova da Beira) have been involved in fomenting innovation and competitiveness. We used a

¹ The 3 NUTS III of Beira Interior of Portugal are the sub-regions (NUTS III), of the Interior Central Region: Beira Interior Norte (BIN), Beira Interior Sul (BIS) and Cova da Beira (CB) (Raia Central Portuguesa-RCP)

survey applied to a vast set of companies that, directly or indirectly, could be involved in the promotion of innovation and competitiveness of this region.

Thus we present the results of an empirical research from the companies located in these 3 sub-regions and it is part of one investigation plus vast that encloses the sub-regions of Raia Central Portuguesa (three Portuguese and two Spanish) of the Portugal/Spain border. The sample of the actors for the study includes 105 companies.

The methodology is based on the application of the multivariate statistics: *K-means analysis clusters* that allowed the study to distinguish 3 standard behaviours of the companies relative to their involvement in innovation activities. To the classification of the standard behaviours of the companies the *crosstabs* and *compare means* analysis was applied to identify the characteristics of each standard.

Thus, the aim of this paper is to generate local development using innovative small companies of Beira Interior. Hence, we will present a brief theoretical framing and the methodology. Later we will evaluate the contribution of the companies of the 3 sub-regions of the BI, relative to their innovation activities. Finally, we present some final reflections.

2- Theoretical Approach

The competitive and innovative performance of the territory depends on the strong participation of different actors: companies, public and private institutions. However, increasingly, innovation in small companies and local development, with special attention to peripheral regions, it is a theme of some studies particularly of Nicolas and Noronha (2000); Vaz e Cesário (2003). The importance of the SME on territorial innovation processes is also patent in different papers presents on International Conference of “Small Firms Strategy for Innovation and Regional Problems” realised in Faro (December 2003).

In our opinion, a simultaneous and articulated analysis concerning firm size, innovative activities and social environments has to be built on, in order to better understand how

an to what extent small firms have a capacity to trigger and sustain endogenous development in less favoured areas (Nicolas and Noronha, 2000, p.1).

In the area of regional economy the influence of economic geography has enlarged the debate, introducing new concepts like “*territory, local development, milieu innovateur*”, and regional/local innovation systems. Theorists of development issues like Bramanti (1999) Bramanti and al. (2000), Camagni (1999) (eds.2000), Maillat and Kebir (1999), etc., use a few theoretical approaches incorporating the territorial and spatial socio-economic constraints from which a set of conditions for local endogenous development could be suggest. In this context, many of these descriptions refer to small companies as determinant actors in the process for regional dynamism, but only when the economic territories generate an environment context, inputs from agents have a synergetic effect.

The competitive performance of the regions is associated with strong innovation dynamics. But innovation as a concept and as an application has suffered deep alterations. The innovation concept has come to encompass not only the perspective of Schumpeter (1934), that innovation exists when new elements are introduced (radical innovation), but also the adaptation, modification and improvement of products, processes or services (incremental innovation).

Moreover, in the last decades the idea that innovation results from a process in chain with origins in applied investigation, with well delimited sequences and of automatic chaining has been rejected. Effectively, the linear model was abandoned. Today consensus is verified in the studies of Dosi (1988), Dosi et al (1988) Cheap (1992), Edquist (1997), Guinet (1999), Orange (1999), Simões (1999), Lopes (2001), Conceição and Avila (2001) and Lundvall (1992), among others, that innovation results from a system of feedbacks, forward or backward linkages, between different functions and different actors in a network of cooperation .

Also, Landabaso (1997) analyse the innovation process at regional level and consider it when a systemic phenomena based in the accumulation of learning processes results of cooperation networks that encourage the interaction between the different actors. Effectively, a emphasis has been put on the analyses of local development in the

literature particularly the role of innovation and its diffusion in the regional or local development.

Prior to the paradigms global-local-regional level, the systemic and network approach, the mechanisms of governance and the rise to the knowledge economy, we can analyse the companies behaviour relative to the following elements: process of innovation, the mechanisms of knowledge, the networks and the system of governance. These elements are both inter-linked and affecting each-other from within. Moreover, these concepts reflect the before problematic and can be organized to promote the territorial innovation and the competitiveness.

In this view, the competitive capacity of the territories does not depend only on their endowment in traditional resources (capital, labour and money), but rather depends basically on its innovative dynamics. The territories with pro-innovation attitude (in intangible resources - knowledge and use of the ICT) are more competitive in a world that is increasingly marked by the internationalization and globalization.

In this context, the knowledge mechanisms: *collective learning* and *individual learning*, improving existing knowledge and allowing the production of new knowledge. Thus, on going training, the permanent learning, is of extreme importance for the economies to become innovative and more competitive.

To reduce the uncertainty and the excessive risks associated with the innovation process the networks are a good solution. The network seems to be a necessary (but insufficient) condition to transfer skills, knowledge and heterogeneous information and sources of innovation for the region.

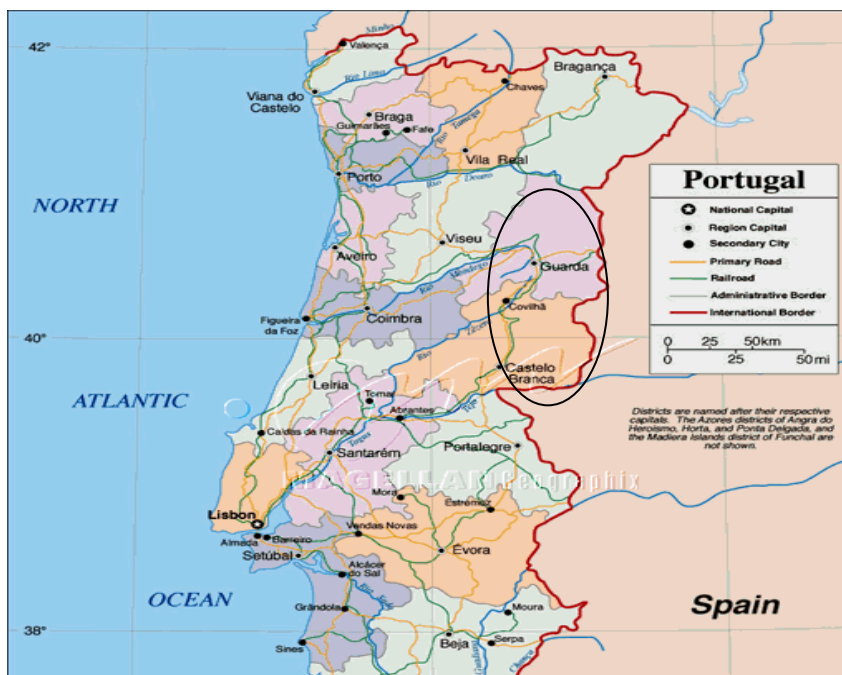
However, the ability to guide and to decide the organization and regulation of the territory to promote innovation and competitiveness depends on an efficient governance system. The governance system, the set of institutional actors with capacity to decide on the territory, have a central role in this process, through the projects that it define, the regional politics and also in the organization and regulation of the local activities. It defines the rules of the game of decision procedures, modalities of commitments and

the coordination actors. The governance of a territory must be assured by the functioning of local cooperation networks (formal or informal).

Thus, the complex interaction among these elements (knowledge, networks and governance), brings a potential innovation into an effective innovation; it allows for improvement the ability to innovate and enable to the territory (innovative) to compete, to grow and to strengthen its internal cohesion.

3- Methodology

The 3 Portuguese sub-regions (NUTS III) of the Interior Central Region are Beira Interior Norte (BIN), Beira Interior Sul (BIS) and Cova da Beira (CB) (Raia Central Portuguesa-RCP or part of Beira Interior except Pinhal Interior Sul and Serra Estrela).



These sub-regions are characterized by having come to lose population, quantitatively and qualitatively. They present debility in their company structure and insufficient economic capacity. Therefore, in the several studies of Reigado (1992, 1995, 2000a, 2002), Santos and Caetano (eds) (2002); Lourenço (1996) among others, these sub-regions are qualified as disfavoured and depressed. They present a geographic and

political situation of periphery, a territory that we could call of *very marginal and distant from the national centres of decision*, (Hernández, 2000, p.17) and of consumer centres.

Moreover, according to statistical data of the INE (Institute National of Statistics-Portugal), BELÉM², the services companies predominate with 68% in Beira Interior registering in the BIN the highest value of this sector. Civil construction (CAE 45) represent 11% of the total of companies and the transforming industry represents only 17% of the total of companies of RCP. In comparison the agro-industries represents greater parcel of companies about 5% in the 3 Nuts III of Beira Interior.

Companies with less than 10 employees predominate in the 3 sub-regions that representing about 87% of the companies. The number of companies with more than 100 employees assumes an insignificant value (0,5%). Only 11,2% of the companies of BIN, 12,9% of the companies of BIS, 12,9% of the companies of the CB; have more than 10 employees.

Before these characteristics and the periphery situation of these regions, our interest in these regions is related to the possibility of evaluating its dynamics of innovation through analysis of the participation of the companies to promote innovation, because this drives competitiveness and in the attempt to perceive which factors of the milieu are associated with these dynamics.

To analyze the innovative performance of the companies of the Beira Interior, we used a survey applied to a vast set of companies of this region. To identify the set of Companies for NUTS III Portuguesas (BIN, BIS and CB), we use the Portuguese Base of Establishments and Companies (BELÉM) of INE of year 2002. That database supplies the name, the residence, the CAE³ and the number of workers of each company (for step).

² Portuguese Base of Establishments and Companies (BELÉM) of INE (Institute National of Statistics-Portugal)

³ CAE- Classification of Economic Activities

Thus, the principal source of data resulted from an inquiry carried out with the different companies of these 3 regions that had been developed in order to attain the objectives: to analyze the participation of local companies to promote and increase the innovation and competitiveness and to evaluate the territorial dynamics of innovation as a function of the companies behaviours.

The inquiries, of companies were directed to the managers. The inquiries had been sent personally, for anticipated marking, by postal and by e-mail. The information was initially recollected through the months of January, February, March and April of 2003.

3.1- The Sample

In selecting the universe of this study, were considered all sectors and the companies could present any legal form, with headquarters in Beira Interior Norte, Beira Interior Sul and Cova da Beira and we considered only the companies with more than 10 employees⁴.

The small companies frequently manifest more innovative initiatives, *since they shows greater ability face new challenges without facing as many bureaucratic blockages* (Vaz and Cesário, 2003) and it is this segment of companies that could be most connected to other local actors and just as it depends on its local environment. Moreover, the development of new technologies is more adapted to small companies, where there is little bureaucracy, it is also this segment of companies that has led to the creation of employment (about 66% in the E.U, 54% in the U.S.A., 74% in Japan, according to Vaz and Cesário 2003) and contributed to increase production.

⁴ After this first selection, we verified that, in the Portuguese sub-regions, of a total of 5559 companies of Beira Interior of which 2119 were part of the BIN, 1500 of BIS and 1940 of the CB supplied for the INE - Portugal 2002, if found 237 companies in the BIN, 193 companies of the BIS and 269 companies of the CB. In the impossibility of collect all the cases of universe of the companies (699 of Beira Interior) due to time and of resources, we analyzing a sample was made of 120 companies that represents about 17% of the cases of the universe and take in account the minimum dimension of a sample, to effect a multiple regression $N = 30$ cases, (Hill, M.M., Hill, 2002, p.252), for each NUTS III. The 120 companies of Beira Interior (BIN+BIS +CB) had been proportionally distributed to the number of companies of each NUTS III in study.

The sample of companies used in this study is constituted by 105 companies of Beira Interior that represents 15% of the universe. The structure of the sample of companies is described in the following table.

Table 1: Structure of sample for CAE and for number of employees - 2002

CAE Rev.2	Total of BIN, BIS and CB	
	Nº of Companies	%
01	0	0,0
14	3	2,9
15	16	15,2
17	8	7,6
18	11	10,5
19	0	0,0
20	2	1,9
21	1	1,0
22	1	1,0
24	1	1,0
25	1	1,0
26	5	4,8
27	0	0,0
28	4	3,8
29	4	3,8
31	1	1,0
33	2	1,9
34	1	1,0
36	3	2,9
45	7	6,7
50	8	7,6
51	12	11,4
52	7	6,7
55	2	1,9
60	2	1,9
72	1	1,0
74	1	1,0
80	1	1,0
93	0	0,0
Total	105	100,00
Number of Employees		
1-9	6	5,7
10-19	41	39,0
20-49	31	29,5
50-99	17	16,2
100-249	7	6,7
250-499	3	2,9
Total	105	100

Source: Own elaboration

3.2- Variables of Innovation

The study of innovation in regions of small dimension, as are those that we have analysed, where most innovations are new to the region or company, the adoption of a concept of including innovation is advisable as is the diffusion and the imitation of

technological, organizational, economic and cultural modifications and the formation of human resources.

Thus, we considered the innovation activities, following CIS II and III. Its innovation activities involves Research and Development (R&D) (the R&D inside the organization: the creative work undertaken systematically to increase a reserve of knowledge of the organization, as well as the use of this reserve in the development of new applications, such as products (goods/services), processes or structures, new or improved) and so involve the acquisition of services (external R&D) (the previous activities but executed by other organization (public or private) company or entities of R&D), the acquisition of new equipment, the acquisition of other external knowledge, the formation (internal or externally guided for the development or introduction of innovations), introductions of innovations in the market and marketing (networks of distribution to commercialize the innovations can include studies of markets, market tests, advertising), management techniques and alteration of the structure of the organization.

Prior to this and to characterize the attitude of the different actors in innovation activities we consider the set of variables to classify the behaviour of the companies in activities of innovation:

1. Research and Development (R&D) inside the companies
2. Acquisition of external services - R&D
3. Acquisition of new technologies
4. Information Technologies
5. Acquisition of other external knowledge
6. Formation of Human Resources
7. Introduction of innovation in market
8. Management strategy /techniques
9. Organizational Structure
10. Marketing
11. The company introduced innovation
12. Innovation of product
13. Innovation of process
14. Organizational innovation

To this set of variables we applied the Multivariate Statistical Analysis *K-means clusters*. The aim is to detect standard behaviours of the companies with respect to its involvement in innovation activities. The clusters of the companies were analysed by *crosstabs* and *compare means* to identify the multiple characteristics of each standard

and to perceive the differences observed between the groups and which the factors that are associated with the best performance.

We analyzed the differences between the clusters, to characterize each one of the groups with respect to a set of attributes. The attributes considered were: process of innovation, the mechanisms of knowledge, the networks and the system of governance.

4- Analysis of the involvement of companies to foment innovation

For the territories to be more or less competitive and innovative, it is necessary a strong involvement of all the local agents (public and private), in particular of the companies, in innovation activities. Relative to the involvement of the companies in innovation activities we grouping them in clusters analysis in accordance with a scale of involvement in innovation activities find profiles or characteristics of each group proved more effective. After we analyzed the different clusters to perceive the factors that are associated to better performance and to demonstrate that it is possible to measure and to evaluate the determinant conditions of involvement in innovation activities.

4.1 - Standard behaviours of companies involved in innovation activities

Applying the *k-means clusters analysis* (of the SPSS- Statistical Package for Social Sciences) to the group of variables previously defined for the companies results in 3 groups of companies, each one representing a standard behaviour of innovation with respect to the attitude of each group. Table 2- summarizes the results of each group relative to each of the variables previously presented. Note: that **0** corresponds to NO (cluster is not involved in activities of innovation) and **1** corresponds YES (cluster is involved in activities of innovation).

Table2: Involvement of RCI companies in activities of innovation- Resulted of K-means analysis

	Cluster 1: Medium Involvement N=45	Cluster 2: Reduced Involvement N=33	Cluster 3: High Involvement N=27
Research and Development (R&D) inside of the companies	0	0	0
Acquisition of services of extern - R&D	0	0	1
Acquisition of new technologies	1	1	1
Information Technologies	1	0	1
Acquisition of other external knowledge	0	0	1
Formation of Human Resources	0	0	1
Introduction of innovation on market	0	0	1
Management Strategy /techniques	0	0	1
Structure organizational	0	0	1
Marketing	0	0	1
The company introduced innovation	1	0	1
Innovation of product	1	0	1
Innovation of process	0	0	1
Organizational Innovation	0	0	1

Source: Own Elaboration

The ANOVA relative to the variables selected allowed for the conclusion of its statistical significance. The results (annex 1) show that all the variables disclosed statistical significance. The levels of significance of test F ($p < 0.05$) show that each factor has a differentiated contribution in the 3 groups, according Pestana and Gageiro (2000).

Cluster 1: groups 45 companies characterized by having a median involvement in innovation activities: innovation exists for the introduction of new products in the market, new technologies and ICT and for the qualification of the human resources and for introducing innovations. In this group of companies, innovation is linked with the constant necessity to introduce new products to survive. The companies of this group belong largely to the BIN (49%) while the remaining companies are distributed by the others 2 sub-regions in the following form: CB=31%, BIS=20%. This cluster is constituted of 64% of companies from the transforming industry (CAE 15 - 37) and 22% of commerce (CAE 50 - 54).

Cluster 2: groups 33 companies characterized by a very reduced, insignificant involvement in innovation activities. Its attitude is very passive. Its activity of innovation is only related to acquisition of new technologies. The companies of this

group belong largely to BIS (42%), being the remains of CB=30% and BIN=27%. Moreover, 46% of them are from transforming industry, 30% from commerce, 15% from construction (CAE 45) and 9% from other services.

Cluster 3: groups 27 companies and it is distinguished from the previous groups for having a high involvement in innovation activities. For this group only research and development inside of the company is not important. In this case that we will be able to have really innovative companies, both incremental and radical innovations. The companies of CB (44%), BIS (30%) and BIN (26%) are part of this group basically, as well as the transforming industry (67%) and commerce (29%).

However, we must take under consideration, relative to localization of the companies in clusters and relative to the activities that constitute it. First, the companies of the BIN are in cluster 1 (58%), in BIS, 45 % of the companies belong to cluster 2 and 29% to cluster 1; in CB, 39% of the companies belong to cluster 1 and 33% to cluster 3. Second, we can distinguish the sectors according with the cluster they belong. More than 50% of construction and other services (the commerce is exclude) belong to cluster 2. The commerce is distributed: 36% for cluster 1 and 36% for cluster 2. Relatively to the companies of the transforming industry about 76% are in the two clusters more innovative, with 39% in cluster 3. However, we still have the following relative reflections to the transforming industry (annex 2): agro industries (CAE 15) 50% of companies are in cluster 1, manufacture of textile (CAE 17) 50% belong to cluster 3 and 38% to cluster 1, clothes industry (CAE 18), 73% belong to cluster 1 and 18% to cluster 2.

4.2 - Characterization of the companies' clusters

The three groups of standard behaviours of the companies relative to the involvement in activities of innovation previously identified could be characterized in function of the attributes previously presented: process of innovation, the networks, the mechanisms of knowledge and the system of governance. These attributes will help to trace the profile of innovative behaviours and to perceive which factors or variables of environment those are associated with the best performance in innovation.

4.2.1- The Process of Innovation

In the first instance it is important to approach the general characteristics of company and directors characteristics, because it facilitates the characterization of each standard of the companies in involvement in innovation activities. We will study the companies by analysing legal responsibility, structure, age, volume of sales, step of employees and employees with higher education degree, if it is exporter and the use of ICT. The aim is to perceive which are the general characteristics associated to the best performance of the companies.

For legal responsibility, the 3 clusters are mainly characterized by companies which operate one Quota Societies, following the ones that are Anonymous Societies. However, while cluster 1 has greater percentage of companies with Quota Societies, cluster 3 has the greater percentage of companies as Anonymous Societies and curiously. For company structure, also the 3 clusters are mainly characterized by companies which operate one single establishment, following the ones that are head-office. However, while cluster 1 has the greater percentage of companies with single establishment, cluster 3 has the greater percentage of companies as head-office, and curiously the cluster 2 has the greater percentage of companies who are filial/network. Relative to the age of the company, the biggest percentage of companies has less of 25 years in all clusters. However, cluster 2 exhibits more companies with less than 10 years (36%), and cluster 1 have the big percentage of companies with more than 25 years (36%). In cluster 3, 81% of companies have less of 25 years.

Relative to business volume step, in 2002, in the cluster 1 and 2 about 90% of companies are business volume inferior 5 million Euros, while cluster 3 about 31% of companies has a volume of sales superior 5 million Euros. Moreover, the two clusters less innovative those have a volume business that in average round the 3000000 and 2400000 of Euros (cluster 1 and cluster 2, respectively, while cluster 3 presents an average value in the order of the 6800000 of Euros). The exporter companies are most involved in innovation (cluster 3=50%, cluster 1=41% and cluster 2=36% of the companies in 2002).

Relative to employees also differences in the standard behaviours are verified. While the two less innovative groups have less than 20 employees (about 49% of cluster 1 and 55% of cluster 2), only 26% of the companies of the most innovative group have less than 20 employees. Relatively to the employees with higher qualification and the number of computers in the company, also it is the more innovative cluster that presents greater average, 6 and 20 respectively, while in cluster 1, 1 and 6 respectively. Curiously cluster 2, not involved in innovation, presents superiors averages for these variables then cluster 1 (2 people with higher education degree and 6 computers in average). Thus, in average, in cluster 1; 4,8% of the employees have higher education degree, in cluster 2; 6,2% and in cluster 3; 9,8%.

In the cluster 3, all the companies (100%) have access to Internet and computerization of data. The others clusters do not reach 86% for Internet a. Also it is the cluster 3 that has more companies with WEB Page, 52% against 42% of cluster 1 and 39% of cluster 2. Moreover, cluster 3 continues to be distinguished relatively to the use of the new information technologies for electronic commerce and to be related with the customers.

Relative to director's characteristics in those clusters previously defined were detected distinct standards. In the cluster 3, predominate clearly the qualifications of the director with higher education degree 59% (against 42% in cluster 2 and 40% in cluster 1), for opposition in groups 1 and 2 the qualifications of the director are inferior to the 12°degree, for about 40% of entrepreneurs and 27%, respectively.

A- Sources of Innovation

The sources of information are important to innovate it gives suggestions for projects of innovation and it contribute for the implementation of innovations. Thus, it is necessary to identify the main sources of information of the company and to determine the importance degree that is attributed to it. Using the terminology of the Community Innovation Survey (CIS III) and of Conceição and Avila (2001) the main sources of information to innovate can be grouped in Interns to the company, of Market (supplies, clients and competitors), Institutional (Institutions of Higher Education and R&D and

Publics Laboratories) or Other Sources (Conferences, meetings and publications, fairs and exhibition, etc.)

Relative to the previously identified profiles, we can evidence that the main sources of information of the companies to innovate are the internal sources of information to the company and the sources of market. The institutional sources (public institutions of R&D and of Superior Education) assume a reduced value for the 3 groups. This situation discloses to the absence of one strong links between the knowledge producers and the company.

However, this position of the companies does not verify only in the Beira Interior. According Conceição and Avila (2001, p.90) the institutional sources (among others) are considered the sources of information less used by the Portuguese companies (in accordance with CIS II) (*sources who more than 70% of the companies had said not to have used*). Thus, the sources for the development of innovations essentially result of the relationship of the company with customers and suppliers, assuming the information one character more tacit and less codified.

The innovation sources, in the clusters 1 and 3 (with bigger involvement in activities of innovation) that register some differences. For cluster 3 is more important all sources of information that to cluster 1. In cluster 3 the main and more important source of innovation is the company, while in cluster 1 main source of information are the customers. Still relatively to the institutional sources, in average the cluster more innovative that valorised more these sources of innovation. Moreover, cluster 3 values more the sources of information (the other sources) proceeding from the scientific and professional conferences, meetings and publications, where the information has one more codified character, and the companies of consulting then cluster 1.

B- The Impact of Innovation

The degree of impact of the innovations introduced is important to evaluate the objectives of companies toward innovate. The company can innovate to expand the variety of products, the quota of market, to improve the quality of products or to reduce

the costs and increase the quality of natural environment (ambient). The main objectives are different but all are important to improve the competitiveness.

In what concerns the objectives considered, in average, the improvement of the product quality is presented as the goal that motivate the bigger percentage of companies to innovate, following the preoccupation with the enlarge of the variety of products and of quota of market (this situation come to the results of Conceição and Avila (2001). The lesser motivation of companies to innovate is related with the reduction of the consumption of energy and resources.

Relative to the clusters previously identified we verify that the cluster 3, in average values more all intention to innovate. The differences more evident are the motivation to innovate to enlarge the variety of products and the questions related with the natural environment (ambient questions) and rules.

C- Financial support for activities of innovation

The less developed regions of EU have benefited from European supports related to the cohesion funds. However the positive results from such instruments still can not be identified clearly and there has been a search to select the causes why, in spite of those efforts, the regions are increasingly?

One obstacle for development of innovations it is the lack of public financial. Thus, relative to financial support of the Local Administration, of the Central Administration or the European Union, the great majority of the companies (about 80%) evidenced that, independently of standard behaviour they represent, did not get financial support for activities of innovation of the Local and Central Administration. However, the clusters less involved in activities of innovation are those where there was a greater contributes of the Central Administration.

Table3: Financial Support (% of companies)

	Cluster 1	Cluster 2	Cluster 3
Of Local Administration	2	0	4
Of Central Administration	20	15	11
Funds of the EU	42	18	59
Initiatives of the EU	0	0	0

Source: Own elaboration

Relative to the support of Initiatives of EU we verify some improvements in the two clusters of more innovative companies. It increased the percentage of companies that benefited of Communitarian financial support to innovate, 42%, and 59%, respectively for cluster 1 and 3.

D- Obstacles to the innovation

Previously we evidenced that the lack of financial supports was not impeditive to cluster 1 to have an average involvement in activities of innovation, but exist other impediments to the development of innovation activities. Thus it is important to analyze in detail which are the difficulties that companies had found in the development of activities of innovation and if these allow to distinguish the innovative profiles.

Relative to the obstacles to the innovation we can considered the external obstacles (economic and financial) the following obstacles: the extreme risks, the raised costs, the lack of sources of financing, the lack acceptability of the customers and the reduced dimension of the market; and internal obstacles to the company: the lack of information on markets, on technology, the organizational structure, the regulations, the lack of qualified staff, the weak mobility of the workers, the weak requirement of the consumers and lack of cooperation.

For the 3 standards previously defined, cluster 1 attributes greater importance to the external obstacles: extreme risks, raised costs and lack of sources of financing while cluster 3, attributes greater importance to the external obstacles and also the internal obstacles to the company: lack of qualified staff, weak mobility of the workers and the lack of cooperation. The cluster 2 attributes greater importance to the raised costs, the lack of sources of financing, the lack acceptability of the customers and the reduced dimension of the market (obstacles externs) and the rigid organizational structure and the lack of qualified staff. Thus, cluster 3, the cluster more innovative, is more

consciously than cluster 1 with respects the intangible resources, cooperation and also mobility of workers between companies of the region. These factors are more often evoked to promote territorial innovation and competitiveness in a world each time marked by the internationalization and globalization and the knowledge based economy.

E- Future attitude with respect to innovation

The future is uncertain and the future of these regions and of these companies depends inevitably of the attitude with respect to innovation. Relative to the clusters defined previously, in short-term the groups most involved in innovation are those that project to innovate. Innovation in product will be preferential. The innovations in process have the best values in cluster 3. In cluster 2 (less involved in innovation) 75% of companies projects innovate at organizational level.

Table 4: Future behaviour in innovation (%)

Companies	Cluster 1	Cluster 2	Cluster 3
Project to Innovate	58	24	78
Innovation in Product	54	25	67
Innovation in Process	30	38	57
Organizational Innovation	50	75	62

Source: Own elaboration

4.2.2- The networks: Cooperation, competition and subcontracting

The networks have been pointed in some studies: Lundvall (1992), Bramanti (1999), Edquist (1997), OCDE (1997), among others; as an efficient vehicle to promote the territorial innovation and the competitiveness. The innovation process, in the contemporary context, emerge of the endogenous capacities and by networks between the entrepreneurs, as well as between the entrepreneurs and the local institutions as argue Veltz (1999, p.608), Ferrão (2000, p.37). These networks, according to Camagni (1991), Planque (1991), Maillat, Quévit and Senn (1993, p.8), among others, have as main objective to reduce the intrinsic uncertainties to the innovation process. Thus, the cooperation, facilitates the production and transmission of the knowledge flow, determines the innovative performance of the companies and influences the territorial dynamics of innovation.

Relative to the standards of the companies in what concerns its involvement in innovation we have two considerations: first, the information and the indispensable resource access to the functioning of the company, in the most innovative cluster (3), 78% of the companies establish agreements of cooperation (formal or informal) with other external entities to the company, in cluster 1, 64% of them appeal to the cooperation, while cluster 2, only 42% of the companies cooperate with other external organisms to accede to the information and the resources (technological, financiers, human, materials).

The second observation, says respect to the cooperation to innovate and in this case the two clusters more innovative also present differences (cluster 1 = 47% of the companies cooperate to innovate and cluster 3 = 58%, cluster 2 do not have cooperation) and the cooperation to innovate between agents are important for the company. Therefore, coexistence of individual logics of actuation and cooperation mechanisms is verified.

Relative to the most important actors⁵ that cooperate to innovate with the companies we have the following situation: the cluster with more involvement in activities of innovation (cluster 3) has greater cooperation with the suppliers and with companies/commercial associations (60 % of the companies) and Institutions of Higher Education (53%), while cooperation with the customers, consultants round 40% of companies and Associations of Development, Central and Local Administration, Institutions of R&D and other institutions round 20 % of the companies. Cluster 1 presents some differences: it appreciates first the cooperation with suppliers (38% of companies) and after the cooperation with companies (23,8%) and with companies/commercial associations (23,8%), while the cooperation with customers (19% of companies), and in 3rd place with Institutions of Higher Education (14,3% of companies), while the cooperation with institutions of R&D go up to around 20% of the companies and the cooperation with Central and Local Administration round 10% of companies. Also, the cluster more innovative valorises more the cooperation with all actors.

⁵ Having in account the following groups: 1- Companies, 2- Institutions of Support and Assistance to the Enterprise Activity: Technological centres, Enterprise Associations and of Development; 3- System of Education, Formation and I&D: Polytechnic, universities and IEFP, 4- Public Institutions (Local Administration, Regional/Central Administration, and Other public institutions (ICEP, IAPMEI and Regional Association of Municipals).

We can detect, also the subcontracting and competitive relationships in the groups of companies. The last ones overlap with the first ones, for the 3 clusters, what can partially be explained by the differentiation of the product which is not to be a basic aspect in the companies (however cluster 3 presents greater % of companies with subcontracting, 44% for opposition the cluster 1=38% and cluster 2 = 42%).

4.2.3- Dynamic of collective learning

The knowledge mechanisms: *collective learning* and *individual learning* assume an important role in the process of territorial innovation. The dynamics of collective learning are important to make the territories more innovative, and according to De Bernady (2000) it is related with continuity in time (mobility of the work force and relationships between suppliers and consumers) and with dynamic synergies between local actors (rotation of the work force; local innovation in cooperation with suppliers, consumers and spin-off). Moreover, the accumulation of experiences, cultures and *savoir-faire* made throughout decades, the tacit knowledge that is difficult to imitate and to transmit and that it is a source of innovation and competitive advantage. But also individual learning, continuous formation, permanent learning and creativity is important, the work teams and the cognitive skill, therefore it increases the base of individual knowledge and is important for the territories to become more innovative and more competitive.

To analyse the dynamic of collective learning we will consider the answers of companies relative to the existence of an effect of collective learning and diffusion of *savoir-faire* in this region; to appeal of region for the qualification of the human resources, for the training of the human resources and relative to the mobility of employees within the company and the mobility of employees between companies of the same sector and relative to the cooperation (formal or informal) with local suppliers and consumers in region.

In what concerns the sensitivity of the entrepreneurs relative to existence of an effect of collective learning and diffusion of *savoir-faire* (exchange of knowledge, cooperation between agents and diffusion of innovations), the groups of companies previously

defined presents some differences. 75% of the entrepreneurs of cluster 2 say that learning effect does not exist or does not answer for opposition to cluster 1 with 53% of the companies and cluster 3 with 56%.

The less innovative cluster (cluster 2) is the one that less appeal to the single region and more to the national level for the training of the human resources carried through in the region. Curiously is cluster 1 the one where more companies only appeal to the region for the qualification of the human resources and it is the most involved cluster in innovation the one where the companies are more attention for the trainees of the region.

Relative the mobility of employees within the company, cluster 3 the one that less devaluates this question (52% say yes, for opposition cluster 1 with 33% and cluster 2=46%). This situation again happens for mobility of employees between companies of the same sector. Relative to the cooperation (formal or informal) with local suppliers and consumers, cluster 3 is the one that cooperates more with suppliers and with customers to innovate.

Relative to individual learning, if the company was involved in activities of innovation, if it appeals the training of the human resources and if it uses external services of employees formation (internally or external to the company), definitively cluster 3, presents the better values.

4.2.4- Systems of Governance

Accord Cooke (2003), the success of companies depends of the mechanisms of coordination intra-organizational but also between the structure of regional governance. Therefore, accord Lopes (2001) the dynamic of territorial governance configure one virtual geographic space and promote synergies and the competitiveness.

The capacity to decide, adjust and regulate the territory depends of one competent and efficient governance systems. These systems have one important role on territorial innovation process through to the definition of projects, to regional politics and so in the regulation and organization of the local activities.

Relative to the governance systems, we will analyse the entrepreneur satisfaction in concerns to the sub-regions governance systems and their most important problems.

In average, the great part of entrepreneurs don't are satisfied with the local governance systems except in terms of landscape and geography, in terms of environment and traffic congestion and in terms of security that assumes the best averages (good averages). The mobility and transparency of information circulation and the supply of work force with necessary qualification are the elements that present minor averages in terms of satisfaction.

In what concerns the clusters previously definite, in general the two clusters more innovative are the most averages in terms of satisfaction and they are those that more believe that region attracted young persons and entrepreneurs.

The most important problems pointed for the 3 clusters are the lack of economic capacity of region, the lack of governs support, the lack of qualify of human resources and the old population age. To cluster 1, the most important problem is the lack of governs support and to cluster 3 is the economic capacity of region.

5- Finals considerations

The economic literature relative to the questions of regional competitiveness and innovation has come to consider that the capacity of innovation of the territories is related with the company behaviours on the territory and vice versa.

The innovative performance of the territories depends on the attitude of the companies toward the innovation. The quantitative methods had allowed to draw profiles of the involvement of the entrepreneurs in activities of innovation and had allowed to demonstrate greater or minor proximities between the attitudes of the entrepreneurs. It was able to conclude the variables that had more distinguished these profiles were the company to be or not to be exporter, the use of employees with higher education and computers as well as the use of news information technologies, the higher education of

the directors, the utilization of institutional sources to innovate and the main aims to innovate as well as the relations of cooperation to innovate and.

It is also important to point out the companies most innovative most appeals to the innovations in cooperation with Higher Education institutions, the financial supports, the internal obstacles to the company and the effect of collective and individual learning to promote the activities of innovation. Beyond these considerations, it has to add that it is the more involved group of companies in activities of innovation that presents greater predisposition to innovate in the future and greater satisfaction relative to the governance systems.

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Annex 1: ANOVA Applied to the 3 clusters of companies relative to the involvement in innovation

	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
Research and Development (R&D) inside of the companies	1,430	2	,142	102	10,038	,000
Acquisition of services of extern - R&D	1,837	2	,140	102	13,113	,000
Acquisition of new technologies	1,070	2	,185	102	5,792	,004
Information Technologies	2,405	2	,188	102	12,805	,000
Acquisition of other external knowledge	2,056	2	,156	102	13,154	,000
Formation of Human Resources	1,618	2	,217	102	7,452	,001
Introduction of innovation on market	3,814	2	,154	102	24,772	,000
Management Strategy /techniques	7,236	2	,072	102	100,080	,000
Structure organizational	5,077	2	,138	102	36,748	,000
Marketing	2,951	2	,160	102	18,418	,000
The company introduced innovation	10,348	2	,019	102	546,134	,000
Innovation of product	7,492	2	,108	102	69,612	,000
Innovation of process	2,614	2	,155	102	16,913	,000
Organizational Innovation	2,188	2	,110	102	19,956	,000

The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

Annex 2: The CAE in the clusters

CAE a dois digitos * Cluster Number of Case Crosstabulation

% within CAE a dois digitos

		Cluster Number of Case			Total
		1	2	3	
CAE a	14	100,0%			100,0%
dois	15	50,0%	18,8%	31,3%	100,0%
digitos	17	37,5%	12,5%	50,0%	100,0%
	18	72,7%	18,2%	9,1%	100,0%
	20			100,0%	100,0%
	21			100,0%	100,0%
	22		100,0%		100,0%
	24	100,0%			100,0%
	25	100,0%			100,0%
	26	60,0%	40,0%		100,0%
	28	50,0%	50,0%		100,0%
	29	25,0%	50,0%	25,0%	100,0%
	31			100,0%	100,0%
	33	50,0%		50,0%	100,0%
	34			100,0%	100,0%
	36		66,7%	33,3%	100,0%
	45	28,6%	71,4%		100,0%
	50	12,5%	25,0%	62,5%	100,0%
	51	41,7%	50,0%	8,3%	100,0%
	52	42,9%	28,6%	28,6%	100,0%
	55	100,0%			100,0%
	60	50,0%	50,0%		100,0%
	72			100,0%	100,0%
	74		100,0%		100,0%
	80		100,0%		100,0%
Total		42,9%	31,4%	25,7%	100,0%