e Emerald European Journal of
Innovation Management

Territorial innovation systems and strategies of collective efficiency: the case of Tagus Valley agro-food complex.

SCHOLARONE™
Manuscripts

Territorial innovation systems and strategies of collective efficiency: the case of Tagus Valley agro-food complex.

1. Introduction

There has been a consensus, for decades, about the recognition of the special role of certain locations - in particular, urban areas - as poles of development valuing, in particular, the leadership of the metropolises as privileged centres in a globalised knowledge-based economy (Amin and Thrift, 1992 and 1994; Tödtling, 1994; Scott, 1996; Castells, 1996, OECD, 1996; Veltz, 2000; Sassen, 2001). The main concern is to understand how the interaction and cooperation amid the different actors present in a *predominantly rural region* (OECD, 2009) as it is the case of the Tagus Valley, adjacent to a metropolitan area (Lisbon), can be encouraged to stimulate the flows of information and knowledge amid them.

Thus the aim of this paper is to reflect on the territorial innovation systems and strategies of collective efficiency in a *predominantly rural region close to a city* (Brezzi *et al*., 2011; OCDE, 2013). In detail, our purpose is to identify which actions will facilitate the consolidation of an innovation system in such a type of region by favouring international flows of knowledge. Our empirical research strategy will be, firstly, to evaluate the innovation performance in a set of combined clusters of agricultural activities and food and wine industries, territorially anchored through market and non-market linkages, called the Tagus Valley Agro-Food Complex, and seek for possible determinant factors according to a territorialized institutional framework.

Then, we analyse the intervention of public entities (central and local government, scientific and technological systems and vocational training centres) in order to appreciate whether there is a *local institutional thickness* required to support innovation processes in companies engaged in such complex. In this sense, we tried to assess the degree of presence of a set of intangible and intrinsic factors to the territory, essential to interactive learning and collective actions. For that, we collected primary data through a survey.

The survey took place between November 2010 and March 2011. It involved a sample of firms operating in all segments of the agro-food supply chain located in the region, selected in a purposive way (heterogeneous sampling) and also through the snowball technique.

This method was coupled with the triangulation of information gathered by direct observation, semi-structured interviews to representatives of business agents and local mayors and analysis of diverse documentation (firms' databases owned by Statistics Portugal and Departments of the Portuguese Government, sectoral legislation from the European Community, reports published by regional associations of agricultural entrepreneurs and opinion pieces and interviews released in the specialised press).

From the descriptive and inferential analyses, it was possible to scrutinize which factors were most striking in the various dimensions of innovation. Besides allowing to identify an important set of deficits of institutional nature, inhibitors of innovation performance, the research allowed to formulate various proposals for the purpose of territorial governance, highlighting the need to strengthen the knowledge transfer to the micro and small companies engaged in agricultural activities.

The article is structured in six sections. The first one (introduction) presents the general purposes and research strategy as mentioned above. The second gives a brief review of the literature about the dynamics of territorial innovation focusing on regional innovation systems. The third contains the analytical framework. The fourth addresses the Tagus Valley Agro-food Complex (case study), specifying the data collecting process, interviews' procedures, survey procedures, sampling methods and lastly measurability and indexing methods. The fifth section addresses the results' discussion and the last one the formulation of a wide set of proposals and critical considerations about the relevant actors – the Portuguese Public Administration, Local Government, Higher Education Institutions and private companies (with a special reference to micro and small enterprises).

2. Territorial innovation systems: fundamentals and typology.

As mentioned by Morgan (1997), innovation - *latu sensu,* including not only product, process and organizational innovation in the firm but also the social and institutional nature in the sphere of an industry, region and/or nation - has assumed an ever more central role in the theories of economic development.

The innovation capacity varies from company to company (Hadjimanolis, 1999) but also from country to country and from region to region. It is determined by a complex number and variety of factors, both internal and external to the unit of analysis, exerting stimulating and/or restrictive effects, which promote a significant impact on the innovation process and

on localized dynamics of innovation. A territorial innovative capacity depends on institutional efficiency, based on the commitment and performance of the institutions, their national culture, human capital, innovation's workers skills and technological intensity. However, it also depends on financial resources for innovation, and the linkages and cooperation networks used to stimulate/promote the innovation capacity (Natário *et al*., 2010; Oliveira, 2013).

In the dynamics of regional innovation, it is of particular importance the efficient functioning of regional systems of innovation (Cooke, 1992, 2003, 2008; Howells 1999; Cooke *et al*., 2000; Doloreux, 2003, 2004; Asheim and Gertler, 2005; Doloreux and Parto, 2005; Tödtling and Trippl, 2005, 2012; Trippl, 2006; Asheim and Coenen, 2006; Cappelo and Lenzi, 2011; Camagni and Cappelo, 2012).

In the study of innovation in territories the approach of innovation systems has gained popularity and is presented today in a solid perspective (Tödtling and Trippl, 2012). The innovation systems represent an approach that sees the process of innovation as an endogenous part of the economy (Edquist, 2001). This approach reflects the territorial dynamics of innovation and tries to understand the multiple factors that influence the capacity of innovation in most organizations that involve local productive systems. In particular, there has been a consensus for decades around certain locations' special role as poles of development, exemplified by major metropolises' leadership in global competitive markets - after the emergence of a knowledge-based economy and the ICT's revolution (Amin and Thrift, 1992; Tödtling, 1994; Scott, 1996; Castells, 1996; Veltz, 2000; Sassen, 2001).

The conceptualisation of innovation systems by Lundvall (1988, 1992) emphasizes the interactive knowledge, the economic interactions, market and non-market relations, and the institutional and social structure to promote innovation dynamics. But the approach of innovation systems also includes the description, the understanding, the exposure to the process of innovation as well as all the important factors that influence and are crucial for innovation, outlined in Edquist (1997).

The main concern of such approach is to understand how we can promote the interaction and cooperation among the different players present in a certain region, in order to stimulate the information flows, able to generate both innovation and competitiveness in a sustainable manner.

3

The importance given to regions is due to the fact that these have distinct characteristics of governance and cultural characteristics that make them peculiar and unique. In this way, the system of innovation at the regional level (or regional system of innovation) allows a greater formatting and adequacy of national policies to regional contexts, since there is a higher proximity between the various actors and a greater cultural homogeneity and, also, because the intensities and the dynamics of innovation are sometimes more different among regions than among nations (Kirat and Lung, 1999; Torre and Gilly, 2000; Rallet and Torre, 2004; Boschma, 2005; Tödtling and Trippl, 2005**;** Natário *et al*., 2009).

According to Chung (1999), regional innovation systems (RIS) allow for generating, implementing and adapting efficient innovation sectoral systems in the region. At a regional level, in theory, there is a higher probability to mobilize the community and the different regional players to participate in the innovation process in order to respond to the specific needs of this community.

Also, in the study of regional dynamics of innovation, the *Triple Helix Model* approach (Etzkowitz and Leydesdorff, 1997; Etzkowitz and Zhou, 2007) is of particular importance. According to this model, innovation is the engine for the economic development of countries, companies and regions, and the interaction among Higher Education Institutions - Companies - State ("helices") plays an important role in the innovation process (Etzkowitz and Leydesdorff, 1997). The Higher Education Institutions (HEI) are the helices capable of taking socio-economic development initiatives by combining teaching and research with the filling of gaps in companies, the discovery and application through interaction, connection and collaboration among the various players (Kothari and Minogue, 2002). The State policies to promote innovation are justified by the existence of market failures, thus being very important to consolidate the national (and regional) system of innovation.

This way, the RIS can be seen as an interacting compound of players and institutions of innovation in the region that are directly related to the generation, distribution and ownership of knowledge (Chung, 1999). A more comprehensive perspective encompasses the set of players and organizations (companies, universities, research centres) systematically involved in the development of innovation and interactive learning through common institutional practices (Doloreux and Bitard, 2005).

Asheim and Gertler (2005:300) distinguished between three types of RIS: *(i)* territorially embedded innovation system, in which the firms' innovation activity is chiefly based on

4

localised learning processes stimulated by geographical, social, cultural proximity "without much direct interaction with knowledge organizations" (e.g. agropolitan districts); *(ii)* regionally networked innovation system, with firms being also embedded in a specific region and characterized by localised interactive learning but "policy interventions lend these systems a more planned character through the intentional strengthening of the region's institutional infrastructure" – e.g. a stronger role for regionally based R&D centres, vocational training organizations and other local organizations involved in the firms' innovation processes; *(iii)* regionalized national innovation, substantially different from the two preceding types because the innovation activity takes place primarily in co-operation with actors outside the region. So, "this represents a development model in which exogenous actors and relationships play a larger role".

Navarro *et al*. (2008), Capello and Lenzi (2011), Camagni and Capello (2012), Natário *et al*. (2012) sought differentiated territorial patterns of innovation. According to Capello and Lenzi (2011), a territorial pattern of innovation is made of a combination of territorial specificities (context conditions) that are behind different modes of performing the several phases of the innovation process.

Thus, in a first version, Capello and Lenzi (2011:4-5) identified three patterns in the European regions (NUTS II):

i) *An endogenous innovation pattern in a scientific network*, where the local conditions support the creation of knowledge, its local diffusion and transformation into innovation and its widespread local adoption. This pattern can show a tight interplay in the creation of knowledge with other regions, and therefore be in an international scientific network. From the conceptual point of view this pattern is considered by the existing literature dealing with knowledge and innovation creation and knowledge diffusion;

ii) *A creative application pattern*, characterized by the presence of creative actors interested and curious enough to look for knowledge, inside and outside the region, and creative enough to apply external knowledge to local innovation needs. This approach is conceptually built on the literature on regional innovation;

iii) *An imitative innovation pattern*, where the actors base their innovation capacity on imitative processes, that can take place with different degrees of adaptation of an

already existing innovation. This pattern is based on the literature dealing with innovation diffusion.

Starting from these standards developed by Capello and Lenzi (2011), Camagni and Capello (2012:15) detected five patterns of innovation in the European regions, in particular:

i) *A European science-based area*, characterized by regions with a strong knowledge base and fast innovation processes, specialized in general purpose technology, with a high generality and originality of local science-based knowledge and a high degree of knowledge inputs coming from regions with a similar knowledge base. R&D activity is intense.

ii) *An applied science area*, made of strong knowledge producing regions characterized by applied science, with a high degree of knowledge coming from regions with a similar knowledge base. R&D activity is intense in this cluster of regions too.

iii) *A smart technological application area*, in which a high product innovation rate is registered, with a limited degree of local applied science and high creativity and receptivity which allow to translate external basic science and applied science into innovation. R&D endowment is significantly less intense than in the previous two cases. The apparent target of this group of regions is to achieve specialized diversification across related technologies in diversified technological fields of competence.

iv) *A smart and creative diversification area*, characterized by a low degree of local applied knowledge, some internal innovation capacity, high degree of local competences, which suggest that the non negligible innovation activities carried out in the area rely mainly upon tacit knowledge embedded into human capital. Moreover, regions in this area are strongly endowed with characteristics such as creativity and attractiveness that help to absorb knowledge and to adapt it to local innovation needs.

v) *An imitative innovation area*, showing a low knowledge and innovation intensity, low entrepreneurship and creativity, a high attractiveness of FDI and a good innovation potential.

The strengthening of the endogenous capacity for innovation for a given region should be based on the synergies of various kinds, arising from a set of collective efficiency actions which may be defined - in its original formulation - as the competitive advantage of the

agglomerations of activities or 'clusters', regarded as innovation networks given that they act as a factor for the promotion of cooperation between players, accelerating the production, development and sharing of knowledge and the most efficient use of resources - Schmitz (1999) as cited in Chorincas *et al.* (2011: 316).

3. Analytical framework

In the context of public policies, having the *Operational Schedule of the National Strategic Reference Framework* (MAOTDR, 2007) as reference, a strategy of collective efficiency is defined as "a set of investments, of a material and immaterial nature that fulfil the following requirements: set up a plan of action; foster innovation, qualification or modernisation of a constellation of companies at a national, regional or local level; stimulate the emergence of economies of agglomeration and deliberate joint actions (including network externalities) between companies and all those agents that are able to carry out a relevant action for the development of their sector of activity and their own host territories" (Baleiras, 2011: 301).

Taking into account the theoretical assumptions concerning the territorial dynamics of innovation, addressed in the previous section, the question that arises in this research is the following:

What actions of collective efficiency may facilitate the consolidation of a system of innovation in a non-central region, in order to set up an intelligent strategy of sustainable development?

In a subsidiary way, another question arises reporting to the object of analysis:

Is there an appropriate behaviour in public institutions (particularly, HEI) to support innovation dynamics in the agro-food complex of the Tagus Valley?

In the formulation of these two questions the following objectives should be borne in mind. Firstly, one seeks to evaluate and interpret the innovation performance of a strategic supply chain for the Tagus' Valley economy, taking into account a set of institutional factors territorially differentiated (Table 1).

Secondly, this research aims to analyze the intervention of public authorities (central and local government, scientific and technological system and vocational training centres) in order to understand if there is a *local institutional thickness*. This means the existence of organizations providing knowledge intensive services and sectorial governance by means of *"interinstitutional interaction and synergy, collective representation by many agents, a*

common industrial goal and common cultural standards and values" (Amin and Thrift, 1994).

Such thickness remits to a critical mass of local actors which is crucial for the effectiveness and efficiency of any RSI – whatever is the typology considered (see section 2) - by facilitating interactive learning and making the implementation of a strategy of collective efficiency inside the territory (or region) possible.

Table 1: Institutional elements of a RIS.

Specific to the region	Local scientific and technological basis (educational system, all grades, and R&D units)
	Local vocational training centres
	Local partnerships with business agents
	Performance of the local government (municipalities)
	Cooperation of financial institutions established in the region
	Local labour market
External to the region	External scientific and technological basis (educational system, all grades, and R&D units)
	External vocational training centres
	External partnerships with business agents
	Performance of Public Administration (central government, social security)
	Cooperation of financial institutions established outside the region

Source: Authors' elaboration.

4. Case Study: the Tagus Valley Agro-food Complex

The research method was mainly based on the case study, of an explanatory nature (Yin, 2003). It is so due to the fact that we have started from the theoretical body to thoroughly describe the parallel relations to the market between entrepreneurial actors of the agro-food business in the Tagus Valley and the respective stakeholders, namely the local policy actors. This means that we have checked in meticulous detail the strategic behaviours of cooperation and intra and inter-organizational competition without any purpose of carrying out a generalization to other socio-territorial contexts.

Consisting of two NUTS 3 statistical region[1], *Tagus Plains* ("Lezíria do Tejo", in Portuguese designation) and *Middle Tagus,* the Tagus Valley territory (contiguous at southwest with the metropolitan area of Lisbon, as shown in figure 1) has a strong rural nature which is shown by its high potential for agriculture and forestry. When analysing its profile of productive specialization, by applying the location quotients of relevant activities the existence of a space agglomeration of agricultural activities can be confirmed (table 2).

---

[1] The Tagus Plains is part of Alentejo (a NUTS 2 Portuguese region), while the Middle Tagus belongs to Centro (idem). Considering its municipalities, the Tagus Valley – a region created for territorial administration purposes - includes a total of 21, administratively divided into the Tagus Plains (Almeirim, Alpiarça, Azambuja, Benavente, Cartaxo, Chamusca, Coruche, Golegã, Rio Maior, Salvaterra de Magos and Santarém) and the Middle Tagus (Abrantes, Alcanena, Constância, Entroncamento, Ferreira do Zêzere, Ourém, Sardoal, Tomar, Torres Novas and Vila Nova da Barquinha). The population density, according to Portuguese 2011 Census, is about 70 inhabitants per squared kilometre for a total surface of 6.581 km^2; substantially lower than metropolitan area of Lisbon's (931 inhabitants per squared kilometre). This groups two NUTS 3 sub-regions: Great Lisbon (including Lisbon and medium-sized cities like Amadora, Loures, Odivelas and others) and Setúbal's Peninsula (at the south bank of Tagus' estuary). It's territorial area is about 3.015,24 km^2. The data are accessible at Statistics Portugal's website.
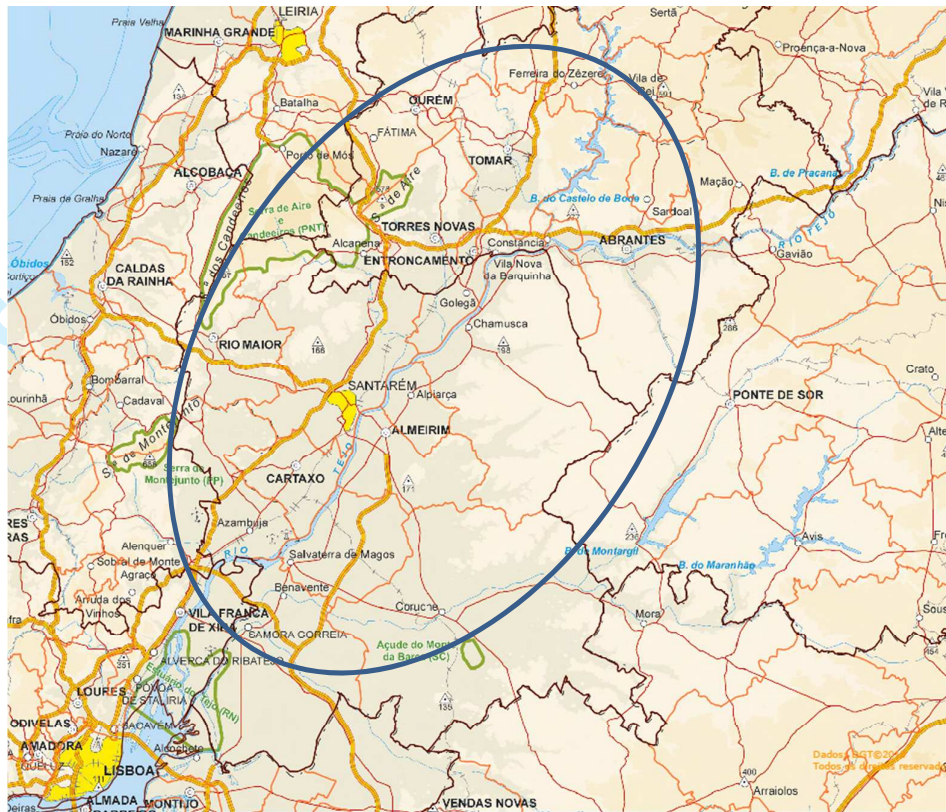
Figure 1: Tagus Valley and surrounding NUTS 3.

Note: Geographical limits for NUTS 3 are drawn with black lines.
Map designed using public software provided by the General Directorate of Territory:
http://mapas.dgterritorio.pt/

Table 2: Location quotients of agricultural activities in the Tagus Valley vis-à-vis the continental territory (year 2009 data).

Source: Calculations based on data provided by the Portuguese Ministry of Labour and Social Security.

Groups of agricultural activities (NACE Rev.2)[2]	Relative weight per group in the universe of establishments in the Portuguese Mainland (1)	Relative weight per group in the universe of establishments of the Tagus Valley (2)	Location quotient by group of activities[3] (2)/(1)
A1.1 - Non-perennial crops	1,11%	2,94%	2,65
A1.2 - Perennial crops	0,62%	0,54%	0,87
A1.3 - Plant propagation	0,02%	0,03%	1,33
A1.4 - Animal production	0,53%	1,26%	2,37
A1.5 - Mixed farming	0,88%	1,22%	1,39
A1.6 - Support activities to agriculture and post-harvest crop activities	0,30%	0,42%	1,41
Total	3,47%	6,41%	1,85

[2]The abbreviation refers to the statistical classification of economic activities in the European Community (NACE Rev.2).
[3] A value greater than 1 is an evidence of firms' agglomeration, suggesting that the group of activities is spatially concentrated in the Tagus Valley.

4.1 Data collecting method

To collect evidence, from qualitative techniques, we have done the "triangulation" of various sources used in accordance with the previously referred methodology:

a) Semi-structured interviews with entrepreneurs, managers, associations' leaders and members of local government;

b) Direct observation (i.e. a direct contact with innovative practices used in farms and units of food processing and beverage's production);

c) Search for official documents (European Community legislation regulating markets of agriculture, food and beverages of an agricultural nature);

d) Collection of news released in the regional press, about relevant economic activities;

e) A survey of business owners and managers of companies involved in the above mentioned markets.

However, we are aware of the possible lack of accuracy and of the subjectivity inherent to the data collection method (Yin, 2003). Bearing this limitation in mind, we have opted, in addition, for following a positivist line of research and carried out a statistical inference analysis about the hypothetical association between innovation and possible explanatory factors of an institutional nature, detailed in the previous table.

4.2 Interviews´ procedures

Given the diversity of actors (entrepreneurial, institutional and political), we have opted for interviewing representatives of the municipalities belonging to Tagus Plains and the producers in the activity areas included in the agro-food supply chain.

The interviews lasted, in average, 2 hours and took place at the interviewee workplace, and the questions were asked with no help from a previously written script. This allowed for raising questions that had not been thought of *a priori*, as well as exploring subjects that could only be brought into light because of the interviewees' tacit knowledge and wisdom.

As for the mayors, councilmen and heads of office of the municipalities of Almeirim, Alpiarça, Azambuja, Benavente, Cartaxo, Chamusca, Salvaterra de Magos and Santarém very rich information was gathered on such aspects as the scope of the measures of social protection developed by the municipalities – namely in those with high rates of aging population. Also, it was possible to have a more accurate perception of the tension between the mayors of the region and the several entities linked to the environment and territorial

11

planning – particularly the Portuguese Environment Agency and the National Ecological Reserve. The interviewees represented the majority of municipalities integrated into the Inter-municipal Community of the Tagus Plains[4].

With regard to the representatives of the agriculture business community, of food and winery industries and food trade, it was decided to interview only those having management responsibilities, taking into account the heterogeneity of the business community under scrutiny. As for the contents, we tried to assess:

i)   The intensity and diversity of innovative ways upon their businesses;

ii) The degree of trust in the State institutions (central and local administration bodies, Higher Education Institutions, vocational training centres, R&D centres) and other stakeholders;

iii) Their positioning in the value chain inherent to the regional agro-food business sector.

4.3 Survey Procedures

The survey took place from June 2010 to March 2011 and followed the guidelines set out in the *Oslo Manual* (OECD/ Eurostat, 2005:122-123). We used, then, a direct approach near those able to respond with relevant know-how to the proposed matters, based on preliminary contacts, often counting on the help of people who knew the organizations under research.

The geographical coverage area comprised most of the municipalities in the Tagus Valley region, except Vila Nova da Barquinha, Ourém, Constância and Sardoal (whose areas represent barely 10% of the territory under study).

Because of a substantial change in the definition of agriculture activities, during the period under analysis, in the Portuguese Classification of Economic Activities[5] and the legal requisites established for agricultural producers in the access to supporting funds for improvement of productive and innovative capacities, the surveyed sample might only be considered representative in relation to the *available* population.

Given its heterogeneous character, there was a need to stratify the target population according to the role performed in the supply chain: *(i)* farmers (individual entrepreneurs and societies);

---

[4] This is the NUTS 3 sub-region with the greatest number business units operating in the agro-food supply chain (according to 2009 Agricultural Census).
[5] Before 2008, such activities as cork extraction, gardening and aquaculture were classified as agriculture activities. Since then, these are explicitly crop and animal production, and related services activities.

(ii) producers´ organizations (officially recognized[6]); *(iii)* agricultural cooperatives (not recognized as producers´ organizations); *(iv)* cooperative wineries; *(v)* agro-industries (whose job is the processing of agricultural raw materials); *(vi)* agro-food corporations, whose main business activity is the trade, in bulk, of food for human consumption (they can also engage in a food processing activity).

The questionnaire was sent and received by email, with absolute control of the identity of the respondent. The 47 closed-ended questions were based on the following types: dichotomous, multiple choice and scaled questions; which are detailed in Oliveira (2013). The purpose, on the one hand, was to collect information about the behaviour of companies and respective stakeholders to boost innovation during the first decade of 2000; on the other, to capture business agents' opinions about the quality and/or amount of relevant territorial resources. A clear identification of the organization was included (firm, headquarters or branch, commercial registration activities, number of employees), as well as of the respondent (name and position in the organization). We have considered chiefly the organizations addressed to the core activities in the supply chain, regardless of the size and the legal form of commercial registration.

The following procedure was used to control the quality of the answers:

i)   answer guides were enclosed through messages attached, on purpose, to the questionnaire;

ii) logical comparison of the answers given to the questions of a similar content.

In the rare cases in which incoherence was detected the respondent was contacted again to clarify any misunderstandings.

4.4 Sampling

As a sampling strategy, it was *non-probabilistic* in the case of the farmers given the impossibility of knowing the units to be analysed. An accurate counting provided by the Statistics Portugal was not possible because of the change in the classification of agricultural activities - according to the third revision of Portuguese Classification of Economic Activities, in 2008, brought into line with NACE Rev.2. Besides that, the criteria for sampling were very restrictive, including not only the condition of being a farmer but also

---

[6] Recognition criteria are expressed in the article 154 of Regulation (EU) No. 1308/2013. This regulation establishes, in the European Union, a common organisation of agricultural products' markets.

take part as member in a producers' organization; as well as to have official registration for taxes and social security purposes.

The data available referred to December 2005. Nevertheless we opted for using it, and frequency tables were drawn to understand which municipalities had the most of these activities. They were privileged as to the application of the survey and, despite the difficulties mentioned, the representativeness of the sample was protected.

The identification of the units eligible for this actor category benefited from the guidance given by coordinators and/or managers of the following entities: *(i)* Farmers' Association of Ribatejo[7] (a regional association of farmers' organizations); *(ii)* Farmers' Association of the municipalities of Abrantes, Constância, Sardoal and Mação (four small towns located in the north of the Portuguese district of Santarém); *(iii)* Association for the Promotion of Rural Development of Ribatejo; *(iv)* Farmers' Association of the Moorland; *(v)* Regional Commission of the Tagus' Wine and Vineyards (a public regulator entity); *(vi)* two of the major Portuguese commercial banks; *(vii)* Public Vocational Training Centre of Santarém. It is worth noticing that notable cases of managers and societies were identified thanks to the members of local government who were interviewed.

Besides the help of experts, we also applied the "snowball" method to the categories with a larger number of people – farmers, agro-industries and agro-food businesses. Concerning producers' organizations, agricultural cooperatives and wineries, the respective universes were surveyed once they could be perfectly identified by means of public documents referring to European Union's funds for agriculture and food industries.

The process described in the previous section resulted in 110 questionnaires validated in most of the answers, corresponding to a global rate of participation of 85% of the entities asked to respond, and the refusal rate was around 4%.

The composition of the sample analysed, by main or secondary relevant activities, is on table 3. By geographical distribution, the most representative municipalities are: Santarém (17.3%); Almeirim (15.5%); Alpiarça, Benavente and Salvaterra de Magos (9.1% each). Regarding to surveyed enterprises size, micro-enterprises represent 49.1%, followed by small

---

[7] Ribatejo is the former Portuguese province matching up to almost of the Tagus Valley's territory.

enterprises (37.3%), medium enterprises (10.9%) and for last the large enterprises (2.7%)[8]. Only 13.6% of the total was included into holdings.

Table 3: Sample's composition by category of regional business agents.

Agent's category	*%*
Agricultural producer	56.4
Producer organisation (with official recognition)	14.5
Farmers' cooperative (without recognition)	4.5
Cooperative wineries	4.5
Agro-industry	15.4
Agro-food company	2.7
Suppliers (seeds, machinery, irrigation equipment, …)	0.9
Associations of producer organisations	0.9

4.5 Measurability and indexing of the variables

Firstly we defined a list of the main variables to be measured (dependent and explanatory) to which variables of direct observation were identified as well as the respective items, together with score scales (binary and Likert's). As dependent variable we have chosen *performance in innovation,* structured in five elementary dimensions: product innovation, process innovation, organizational innovation, marketing innovation and investment in innovation activities. The firm's performance in each of them was measured according to the various variables of direct observation.

We scored the direct observation variables connected to each of them, according to the score scales established to the respective items. Next, we have added the partial scores and came up with the total score of the concerned dimension. The value of the global performance was determined as the simple arithmetic mean of the 5 elementary dimensions.

For reasons of comparability, all values were converted into a sole conventional scale (0-100) and from this point on we have worked with indexes calculated on the total scores. That is, the sum of the scores p concerning the n items defined to a given innovation's dimension were rescaled overcoming this way the difficulty of working with different maximum values ($V_{Max.}$) and minimum ($V_{min.}$) according to the number of items for each variable and the assessment scale ascribed to it. In short, we followed two steps:

    i)   Find out, according to its n items, the value of the i-*th* dimension of innovation concerning a given statistical unit observed:

---

[8] The criteria to determine a firm's dimension are those defined in EU recommendation 2003/361.

$$IV_i^{\ obs} = \frac{V_i^{\ obs} - V_{\min}}{V_{Max} - V_{\min}} \times 100$$

ii) Convert that value into an indexed scale:

$$V_i^{\ obs} = \sum_1^n p \qquad\qquad p_{\min} \le p \le p_{Max}$$

This procedure is also used in the *Community Innovation Survey* (Eurostat/European Commission, 2006, 2008 and 2010) and the *Regional Innovation Panel* (European Union, 2012; European Commission, 2014). It was applied coherently to the elementary explanatory variables in order to interpret their relative importance as for descriptive statistics – especially as far as the measures of central tendency and dispersion are concerned. To make the reading of the indexed values more intuitive, the state of each indexed variable was classified according to an ordinal scale per quartis as follows: *very modest, modest, good* and *excellent*. Such classification was extended to the latent variables representative of the institutional factors considered in the quantitative analysis[9].

To perceive if there was an association between the innovation dynamics and the intensity of non-mercantile interactions (i.e. spillovers of knowledge and sharing of strategic information reducing transaction costs amid the stakeholders involved in the various clusters) two indicators were used: *local innovation index* and *local synergies index*. This shows the theoretical perspective of several authors previously quoted in which the more intangible resources a territory possesses, acting as catalysts of local knowledge synergies and local management risk reduction, the more effective and efficient the inner process of innovation will be. Organizational resources should also count for such benefit, such as the degree of competition and relational capital inside the territorialised supply chain, or the firms' ability to take part in knowledge networks, among others.

For local innovation index measurement it was used the arithmetic mean of the 5 elementary innovation indexes. As for the local synergies index, similar statistic was adopted but using a set of variables representing institutional factors *specific* to the region; as opposed to another

---

[9] For instance, the local scientific and technological basis (i.e. the region's) is assessed according to the simple arithmetic mean of the following direct observation variables: *i)* studies conducted by universities/polytechnic schools and R&D centres in favour of the business; *ii)* geographic location of the universities and polytechnics that are business partners; *iii)* geographic location of the laboratories and R&D public institutions that are business partners; *iv)* geographic location of the laboratories and R&D private institutions that are business partners; *v)* number of employees with higher education degrees or vocational training who attended schools in the region.

set including those external to it (both mentioned in the captions of the tables that follow in the next section). This second set was used to calculate the *external synergies index*. Such procedure was based on the following assumption: the more a territory emulates an innovative rural milieu, the easier it will be for local companies to enter in innovation external networks; which will effectively reduce the uncertainty linked to the innovation process (Camagni, 1991). This reduction should induce a higher intensity of investment in related activities.

Considering the above mentioned, the institutional factors (local and external) shall exhibit a significant positive correlation with the innovation performance (at local level), in general and by component. We expect the same happens, on the one hand, between the local synergies and innovation; and on the other hand, between the external synergies and the investment related to innovation activities.

5. Results

Considering the part based on interviews, this study allowed for the conclusion that there is a consensus amid the producers to judge their organizations as partners; which doesn't prevent, however, the existence of strong individualism and rivalry. This fact weakens their negotiating stance before the other economic actors in the supply chain (agro-industries, agro-food businesses and big retail companies) exposing themselves to the risk of trade practices typical of monopsony. This behaviour does not favour the social consensus about a fair distribution of the value generated in the respective chain.

About the agro-industries and agro-food businesses their connections through the *Agrocluster do Ribatejo* (Ribatejo's Agrocluster) are impressive. This regional association is, mostly, a channel for funding opportunities under economically advantageous conditions to strengthen their productive capability. Actually it is an excellent promoter either of external organizational economies, or internal scale economies by attracting the necessary public funding to boost private investments in new technological processes and new external markets.

As for the perception that political actors have about private initiative, there is unanimous acknowledgement by the interviewed mayors on how important the establishment of companies that create jobs for the local labour force is, if their owners don't stop investing whenever possible fiscal benefits will no longer be available. By analysing their opinions

and comments, a clear worry is detected both because of the impact on local community and on local finances. In particular, a major concern has to do with the encoded and implicit knowledge gathered during years of work performed in those territorialised companies, socially responsible and innovative. Consequently, a number of municipalities have decided to articulate the revision of the Municipal Development Plans with the availability of entrepreneurial location areas provided with the necessary infrastructures and accessibilities to create attractive conditions to business investment.

In terms of correlational analysis, using survey data, the research on the hypothetic influence of some institutional attributes on innovation dynamics was based on non-parametric correlational tests – tables 4 to 7. Such tests, based on Spearman's (rank) correlation (r_s) were used once we have previously checked that the variables, in general, do not follow a Gauss distribution of probability (verified by Kolmogorov-Smirnov tests, not shown).

Table 4: Correlation of innovation with the institutional factors specific to the region.

Institutional factors	A211		A212		A213		A214	
Dimensions of innovation	r_s	p	r_s	p	r_s	p	r_s	p
Product innovation	+0.27	**0.004**	+0.12	0.230	+0.22	**0.022**	+0.37	**<0.001**
Process innovation	+0.29	**0.002**	+0.26	**0.007**	+0.29	**0.003**	+0.38	**<0.001**
Organisational innovation	+0.38	**<0.001**	+0.18	0.059	+0.27	**0.004**	+0.24	**0.013**
Marketing innovation	+0.16	0.088	+0.18	0.055	+0.13	0.195	+0.35	**<0.001**
Investment in innovation activities	+0.32	**0.001**	+0.12	0.198	+0.15	0.118	+0.38	**<0.001**
Local innovation	+0.36	**<0.001**	+0.22	**0.021**	+0.29	**0.003**	+0.46	**<0.001**

Table 5: Correlation of innovation with the institutional factors specific to the region (conclusion).

Institutional factors	A215		A216		A21	
Dimensions of innovation	r_s	p	r_s	p	r_s	p
Product innovation	+0.18	0.061	+0.11	0.259	+0.29	**0.002**
Process innovation	+0.25	**0.009**	+0.33	**<0.001**	+0.44	**<0.001**
Organisational innovation	+0.23	**0.015**	+0.31	**0.001**	+0.40	**<0.001**
Marketing innovation	+0.20	**0.040**	+0.27	**0.005**	+0.31	**0.001**
Investment in innovation activities	+0.25	**0.007**	+0.25	**0.008**	+0.36	**<0.001**
Local innovation	+0.28	**0.003**	+0.33	**<0.001**	+0.47	**<0.001**

Caption: A211 - Local scientific and technological basis; A212 - Local vocational training centres; A213 - Local partnerships with business agents in the supply chain; A214 - Performance of local government A215 - Cooperation of financial institutions established in the region; A216 – Local labour market; A21 – Institutional attributes specific to the region.

Table 6: Correlation of innovation with the institutional factors external to the region.

Institutional factors	A221		A222		A223		A224	
Dimensions of innovation	r_s	p	r_s	p	r_s	p	r_s	p
Product innovation	+0.28	**0.003**	+0.14	0.137	+0.26	**0.007**	+0.36	**<0.001**
Process innovation	+0.30	**0.002**	+0.27	**0.004**	+0.30	**0.002**	+0.23	**0.017**
Organisational innovation	+0.33	**0.001**	+0.20	**0.035**	+0.30	**0.001**	+0.22	**0.020**
Marketing innovation	+0.13	0.188	+0.22	**0.022**	+0.23	**0.017**	+0.49	**<0.001**
Investment in innovation activities	+0.28	**0.003**	+0.16	0.090	+0.19	**0.042**	+0.42	**<0.001**
Local innovation	+0.33	**<0.001**	+0.26	**0.007**	+0.35	**<0.001**	+0.44	**<0.001**

Caption: A221 - External scientific and technological basis; A222 - External vocational training centres; A223 - External partnerships with business agents in the supply chain; A224 - Performance of public administration.

Table 7: Correlation of innovation with the institutional factors external to the region.

Institutional factors	A225		A22		A2	
Dimensions of innovation	r_s	p	r_s	p	r_s	p
Product innovation	+0.21	**0.030**	+0.36	**<0.001**	+0.34	**<0.001**
Process innovation	+0.28	**0.003**	+0.44	**<0.001**	+0.45	**<0.001**
Organisational innovation	+0.25	**0.007**	+0.42	**<0.001**	+0.42	**<0.001**
Marketing innovation	+0.25	**0.009**	+0.38	**<0.001**	+0.34	**<0.001**
Investment in innovation activities	+0.30	**0.002**	+0.41	**<0.001**	+0.39	**<0.001**
Local innovation	+0.32	**0.001**	+0.51	**<0.001**	+0.50	**<0.001**

Caption: A225 - Cooperation of financial institutions established outside the region; A22 - Institutional attributes external to the region; A2 - Institutional attributes (specific and external to the region).

Considering the p values quite below the conventional critical threshold of significance (0.05) and the sign of the correlation coefficient, a greater availability of institutional attributes (whatever their geographical location is) is positively associated with better innovation performance. Thus such attributes can be seen as institutional resources playing a significant role in knowledge creation and dissemination in the territory.

The data shown in tables 8 and 9, in general, suggest that the indexes of local and external knowledge synergies are modest. Notwithstanding, there are statistically significant positive relations, on the one hand, between the local synergies index and the local innovation index; on the other, between the external synergies index and the index of investment in innovation activities.

Table 8: Statistics on the measures of central tendency and correlation test for the indexes of local innovation and local synergies.

Statistics	Local innovation index	Local synergies index
Mean ($\overline{X}$)	46.50	41.84
Median (Med)	45.96	40.55
Standard deviation (s)	21.62	9.78
Mean's Interval of Confidence (level of 95%)	(42.46 ; 50.54)	(40.01 ; 43.67)
Minimum (X_{min})	2.72	18.92
Maximum ($X_{máx}$)	86.69	64.70
N = 110	r_s = 0.568	**p < 0.001**

Table 9: Statistics on the measures of central tendency and correlation test for the indexes of investment in innovation activities and external synergies.

Statistics	Index of investment in innovation activities	Index of external synergies
Mean ($\overline{X}$)	39.59	28.19
Median (Med)	38.75	24.92
Standard deviation (s)	20.66	16.17
Mean's Interval of Confidence (level of 95%)	2.50	0
Minimum (X_{min})	92.50	82.73
Maximum ($X_{máx}$)	(35.72 ; 43.47)	(25.15 ; 31.22)
N = 110	r_s = 0.321	**p = 0.001**

19

6. Conclusions

Regional systems of innovation are one of the theoretical approaches focused on demonstrating the innovation relevance in regional studies and theorize a place-based innovation model. The local and regional perspective of the innovation systems provides a baseline for the analysis of specific characteristics of territorial innovation processes and to the definition of policies, specifying the mechanisms and processes that promote innovation in certain regions. In this way the innovation systems approach is coupled with the need to define and coordinate innovation policies and strategies according to the specific characteristics of each region, involving the highest level of the Government, the local level (municipalities), businesses agents and the academic community.

This study aims to evaluate and interpret innovation performance, within a set of economic activities - namely the regional agro-food supply chain - that characterize the pattern of productive specialization of the Tagus Valley, under the hypothesis of several determinant factors of institutional nature.

From the results obtained we can conclude that a territorial strategy of smart specialization for the Tagus Valley must be based on the reinforcement of effectiveness and efficiency of public policies addressed to innovation, according to the guidelines described below.

In order to accomplish it, firstly, the coordination amid public bodies responsible for laws and regulations must be intensified, based on a deeper interaction amid them. A vertical and horizontal perspective of central administration is needed. Thus, such problems as the lack of standardization of procedures, concepts and rules will be overcome, and coherence with the priorities of the *National Strategy for a Sustainable Development – 2015* (APA, 2008) will be achieved[10].

The empirical results suggest that the pattern of innovation prevailing in the territory will be, in the typology of Camagni and Capello (2012), like a *smart and creative diversification area*. We have found evidence that a substantial effort has been made by the Portuguese State in order to mobilize regional actors (Local Government, business agents, technology transfer agencies, Higher Education institutions and vocational training centres) in a shared strategy

---

[10] We refer, in particular, to a public administration "more efficient and modernized (...) by adapting it in its functions and organizational models and by improving the quality of services provided to citizens and businesses" (APA, 2008, p.14). APA is the Portuguese Environment Agency, within the scope of the Portuguese Ministry of the Environment, Territory Management and Energy.

of endogenous development of regionally networked innovation type (Asheim and Gertler, 2005). However, a significant part of micro and small firms' innovation capacity still depends on local knowledge networks involving business stakeholders, apart from regionally based knowledge organizations. This leads us to argue that the regional development's path actually followed in the first decade of the new century has been much closer to a territorially embedded innovation system. But looking more attentively at what seems to be the innovation's pattern among medium and great companies, an intentional linkage with the scientific and technological basis located outside the region (or even abroad) is evident.

Secondly, a more flattened and compact design for the Portuguese State's body is advisable, i.e. less hierarchical layers and less dispersion of competences and responsibilities by multiple departments. Often the idea of inertia in central administration stands because of the variety and quantity of legal authorizations and certifications required by law to the promoters of rural development projects - namely in agriculture and agro-industry activities.

Thirdly, the central Government is expected to have a long-term strategic vision. That is, it is desirable that public policies become less dependent on political cycles, which are too short for any operational plans to produce effective results, as regards to the competitiveness of the territory.

Thus we suggest the following actions for a greater collective efficiency, optimizing the resources towards a smart specialization:

a. Establish a territorial agreement amid the representatives of the inter-municipal communities of the Plains and the Middle Tagus, business associations and consumers/citizens, without submission to any "elites" (academic, entrepreneurial or partisan). This will help to optimize the trade-off between the time it takes to draw regional plans of participative democracy and the accountability of the policymakers towards their voters.

b. Put into practice an external performance assessment system based on such criteria as the time it takes for a clear answer to the information demands and legal opinions to be given, to overcome immediateness or immobility which is, so very often, attributed to State authorities. This shouldn't, however, prevent citizens from questioning the quality of the legislation issued by governments, both at the national and the European Union levels.

The strengthening of local institutional thickness, through the intensification of relations amid Higher Education institutions, is crucial for a widely accessible knowledge base and thus

foster innovation processes, filling the gaps among companies in terms of R&D. Shortening the detachment between universities/polytechnics and the agro-business units demands the provision of knowledge intensive services (including training and consulting provided by the Higher Education Institutions and R&D centres), as well as the funding of courses on the part of companies. This organizational proximity will be the backbone to a better regional innovation performance.

In terms of policy making, in short , it is crucial to:

1. Strengthen the linkage between the productive sphere and the scientific and technological system in order to enhance the transfer of knowledge for micro and small enterprises, particularly in agricultural activities.

2. Intensify the coordinated collective actions through local institutions for the promotion of products originating in the territory.

3. Sensitize young people for multiple career opportunities in activities directly or indirectly linked to the agro-food business of the Tagus Valley.

In particular, micro and small enterprises must be compromised with the strategic requisite of increasing respective human capital endowment in order to improve their capacity to absorb technological knowledge, so intensifying interactive learning by means of intentional spillovers (specialized consulting and training postgraduate courses and participation in scientific workshops in Portugal and abroad).

Fourthly, the centralization of municipal competences in the inter-municipal communities is advisable as far as the establishment and/or management of industry poles, science and technology parks, business location areas and other infrastructures are concerned; these can trigger location external economies and knowledge spillovers. The multiplication of collective infra-structures, of questionable social usefulness given a predictably insufficient local demand, would thus be avoided.

Lastly, as the local scientific and technological basis is an endogenous factor favouring innovation (and probably internationalization), it is important to invest *ex ante* in the education system (from nursery school to higher education) located in the region. In extracurricular activities a direct contact with successful businesses in the regional supply chain – from farms to agro-industrial and agro-food units - is absolutely necessary. This urgent proximity will prove the public school to be a privileged space of socialization and

collective learning in rural areas, crucial to foster human capital and more entrepreneurial and civically engaged upcoming generations.

References

Agência Portuguesa do Ambiente (2008). *Estratégia Nacional de Desenvolvimento Sustentável – 2015* ('Sustainable Development National Strategy – 2015'). APA, Lisboa.

Amin, A. and Thrift, N. (1992). Neo-Marshallian nodes in global networks. *International Journal of Urban and Regional Research,* 16 pp. 571-587.

Amin, A. and Thrift, N. (1994). Living in the global. *In:* Amin, A. & Thrift, N. (orgs.) *Globalization, institutions and regional development in Europe.* Oxford University Press, pp. 2-17.

Asheim B. and Coenen L. (2006). Contextualising Regional innovation Systems in a Globalising Learning Economy: On Knowledge Bases and Institutional Frameworks. *Journal of Technology Transfer*, 31, pp. 163-173.

Asheim B. and Gertler M. (2005). The Geography of Innovation. In: Fagerberg J., Mowery and D. Nelson R. (Eds), *The Oxford Handbook of Innovation*. University Press, Oxford, pp. 291-315.

Baleiras, R. N. (2011). The collective efficiency rationale and policy applications in Portugal. *In:* Baleiras, R. N. (org.), *Casos de desenvolvimento regional.* Cascais: Princípia, pp.281-322.

Boschma, R. (2005). Proximity and innovation: a critical assessment. *Regional Studies,* 39 (1), 61-74.

Brezzi, M., Dijkstra, L. and Ruiz, V. (2011). *OECD Extended Regional Typology: The Economic Performance of Remote Rural Regions*. OECD Regional Development Working Papers, No. 2011/06, OECD Publishing.

Camagni, R. (1991). Local 'Milieu', Uncertainty and Innovation Networks: towards a new dynamic theory of economic space. In: Camagni, R. (org.), *Innovation networks: spatial perspectives.* Londres: Belhaven Press, pp.121-144.

Camagni, R. and Capello, R. (2012) *Regional Innovation Patterns and the EU Regional Policy Reform: Towards Smart Innovation Policies*. Paper presented at the 52th ERSA Conference submitted to Growth and Change. Bratislava, 21-24 August 2012.

Capello R. and Lenzi C. (2011). *Territorial Patterns of Innovation in Europe*. Paper presented at the 51th ERSA Conference submitted to "New Challenges for European Regions and Urban Areas in a Globalized Word". Barcelona, Spain 30th August-3rd September 2011.

Castells, M. (1996). *The information age: economy, society and culture. The Rise of the Network Society.* Cambrige, MA; Oxford, UK, Blackwell.

Chorincas, J., Areosa Feio, P., Pais Mamede, R. e Rodrigues, D. (2011). Políticas públicas inovadoras: o caso das estratégias de eficiência colectiva. In: Baleiras, R. N. (org.) *Casos de Desenvolvimento Regional.* Princípia Editora, Lda, pp.313-323.

Chung S. (1999). *Regional Innovation Systems in Korea*, in 3rd International Conference on Technology and innovation Policy: Assessment, Commercialisation and Application of Science and Technology and Management of Knowledge. The University of Texas at Austin, USA, 30 August - 2 September 1999.

Cooke P. (1992). Regional Innovation Systems: competitive regulation in the new Europe. *Geoforum*, 23, pp. 365-382.

Cooke P. (2003). *Strategies for Regional Innovation Systems: Learning Transfer and Applications*. United Nations Industrial Development Organization, Policy Papers, UNIDO, Vienna.

Cooke P. (2008). Regional Innovation Systems, Clean Technology & Jacobian Cluster - Platform Policies. *Regional Science Policy & Practice*. 1 (1), 23-45.

Cooke P., Boekholt P. and Tödtling, F. (2000). *The Governance of Innovation in Europe.* Pinter, London.

Doloreux D. (2003). Regional Innovation Systems in the Periphery: The Case of the Beauce in Québec (Canada). *International Journal of Innovation Management*, 7 (1), 67-94.

Doloreux D. (2004). Regional Innovation Systems in Canada: A Comparative Study. *Regional Studies*, Vol. 38.5, 481–494, July 2004.

Doloreux, D. and Bitard, P. (2005). Les Systèmes Régionaux D'innovation: discussion critique. *Géographie Economique Société*, 7, 21-36.

Doloreux D. and Parto, S. (2005). Regional Innovation Systems: Current Discourse and Unresolved Issues. *Technology in Society*, 27 (2), 133-153.

Edquist, C. (1997). *Systems of Innovation: Technologies, Institutions and Organizations*. London and Washington: Pinter.

Edquist, C. (2001). *The systems of innovation approach and innovation policy: an account of the state of the art*, paper apresentado na DRUID Conference, Aalborg, Junho: http://folk.uio.no/ivai/ESST/Outline%20V05/edquist02.pdf.

Etzkowitz H. and Leydesdorff L. (eds) (1997). *Universities and the Global Knowledge Economy. A Triple Helix of University – Industry – Government Relations*. Cassell Academic, London.

Etzkowitz H. and Zhou C. (2007) *Regional Innovation Initiator: The Entrepreneurial University in Various Triple Helix Models*, paper presented in Triple Helix Conference VI in Singapore. Available at: http://www.nus.edu.sg/nec/TripleHelix6/SingaporeConferenceThemePaper050107.pdf

European Commission (2014). *Regional Innovation Scoreboard 2014*.

European Union (2012). *Regional Innovation Scoreboard 2012*.

Eurostat/European Comission (2006, 2008 and 2010). *Community Innovation Survey*. On line: http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/cis.

Hadjimanolis A. (1999) Barriers to innovation for SMEs in a small less developed country. (Cyprus), *Technovation* 19, 561-570.

Howells J. (1999) Regional systems of innovation? In: Archibugi, D., Howells, J., Michie J. (Eds) *Innovation Policy in a Global Economy*, pp. 67-93. Cambridge University Press. Cambridge.

Instituto Nacional de Estatística (2007). *Classificação Portuguesa das Actividades Económicas Rev.3*. INE,I.P., Lisboa.

Kirat, T. and Lung, Y. (1999). Innovation and proximity: territories as loci of collective learning processes. *European Urban and Regional Studies,* 6 (1), 27-38.

Kothari, U. and Minogue, M. (2002). *Development theory and practice: Critical perspectives*. Palgrave, Houndmills.

Lundvall, B.-Ä (1988). "Innovation as an Interactive Process: from User-Producer Interaction to the National System of Innovation". In: Dosi, G., Freeman, C., Nelson, R., Silverberg, G. & Soete, L. (orgs.) *Technical Change and Economic Theory*. London: Pinter, 349-369.

Lundvall, B.-Ä. (1992) National Systems of Innovation - Towards a Theory of Innovation and Interactive Learning, Printer Publishers, London and New York.

MAOTDR (2007). *Quadro de Referência Estratégico Nacional - Portugal 2007-2013*. Lisboa: Ministério do Ambiente e do Ordenamento do Território e do Desenvolvimento Regional - Observatório do QCA III.

Morgan, Kevin (1997). *The Learning Region: Institutions, Innovation and Regional Renewal*. Regional Studies, Vol. 31.5, pp. 491-503.

Natário, M.; Couto, J.; Braga, A. and Tiago, M. (2009). *Padrões Territoriais de Inovação em Portugal: as NUTS II*. In: actas do XV Congresso da APDR, subordinado ao tema: *Redes e Desenvolvimento Regional*, realizado na Cidade da Praia, Cabo Verde, na Universidade Jean Piaget, 6 a 11 Julho 2009. ISBN 978-989-96353-0-2, pp.3564-3587.

Natário, M.; Couto, J.; Braga, A. and Tiago, M. (2010). *Evaluating the Determinants of National Innovative Capacity Among European Countries*. In: CD das Actas do ERSA 2010 Congress: Sustainable Regional Growth and Development in the Creative Knowledge Economy, Jönköping, Sweden , paper nr. 1342.

Natário, Maria Manuela Santos; Couto, João Pedro Almeida; Braga, Ascensão Maria Martins; and Tiago, Maria Teresa Borges (2009). *Padrões Territoriais de Inovação em Portugal: as NUTS II*. In: CD das actas do XV Congresso da APDR, subordinado ao tema: *Redes e Desenvolvimento Regional*, realizado na Cidade da Praia, Cabo Verde, na Universidade Jean Piaget, 6 a 11 Julho 2009. ISBN 978-989-96353-0-2, pp.3564-3587.

Natário, Maria; Couto, João; Tiago, Teresa and Braga, Ascensão (2012). Innovativeness Patterns in Different European Regions: An Empirical Approach. *Studies in Regional Science*, Vol 42, nº 3, 647-669.

Navarro, Mikel; Gibaja, Juan José; Aguado, Ricardo and Bilbao, Beñat (2008). *Patterns of innovation in the EU-25 regions: a typology and policy recommendations*. Orkestra Working Paper Series in Territorial Competitiveness Number 2008-04 (EN).ISSN 1989-1288.

OECD (1996). *The Knowledge-based Economy*.

OECD (2002). *Frascati Manual: proposed standard practice for surveys on research and experimental development*

OECD/Eurostat (2005). *Oslo Manual. Guidelines for collecting and interpreting innovation data.*

OECD (2009). *Defining and describing regions.*

OECD (2013). *OECD Regions at a Glance.*

Oliveira, P. (2013). *A influência do meio local nas dinâmicas de inovação do complexo agroalimentar do Vale do Tejo: análise e formulação de estratégias territoriais de ação coletiva* (The local milieu's influence in innovation dynamics of Tagus Valley's agro-food complex': analysis and proposals of territorial strategies for collective action) [On line]. Lisbon: ISCTE-IUL, 2013. Doctoral thesis. Available at: www:<http://hdl.handle.net/10071/6378>.

Rallet, A. and Torre, A. (2004). Proximité et localisation. *Économie rurale*, 280, 25-41.

Sassen, S. (2001). *The global city: New York, London, Tokyo*. Princeton, Princeton University Press.

Schmitz, H. (1999). Collective efficiency and increasing returns. *Cambridge Journal of Economics,* 23 (4), pp. 465-483.

Scott, A. (1996). Regional motors of the global economy. *Futures,* 28 (5), 391 - 411.

Seidman, I. (1998). *Interviewing as qualitative research: A guide for researchers in education and the social sciences* (2nd ed.). New York: Teachers College Press.

Storper, M. (1997). *The regional world: territorial development in a global economy.* Nova Iorque, The Guilford Press.

Tödtling, F. (1994). The Uneven Landscape of Innovation Poles. *In:* Amin, A. & Thrift, N. (orgs.) *Globalization, Institutions and Regional Development in Europe.* Oxford University Press, pp.68-83.

Tödtling F. and Trippl M. (2005) "One size fits all? Towards a Differentiated Regional Innovation Policy Approach", *Research Policy*, 34, 1203-1219.

Tödtling F. and Trippl M. (2012). Transformation of regional innovation systems: From old legacies to new development paths. Paper presented at ERSA Conference, Bratislava, August 21-26, 2012.

Torre, A. e Gilly, J.-P. (2000). On the analytical dimension of proximity. *Regional Studies,* 34 (2), pp. 169-180.

Trippl, M. (2006) Cross-Border Regional Innovation Systems. Published Online (http://epub.wu-wien.ac.at).

Veltz, P. (2000). *Mondialisation, villes et territoires : L'Économie d' Archipel.* Paris, Presse Universitaire de France.

Yin, R. K. (2003). *Case Study Research: Design and Methods* (3ª ed.). Thousand Oaks: Sage Publications.