

Learning in Small Firms Across European Rural Regions

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Abstract: - Small medium enterprises (SMEs) interact intensely with the territory in which they locate. Is it possible to awake the need for innovation in SMEs and use them as incubators for local development? If so, how do firms behave when they are innovative? Which determinants have a more effective impact on the innovative choices of small firms? The present empirical analyses uses a set of enquires developed within the frame work of an European research project whose main goal was to model the determinants of innovation in a biunivocal relationship of interdependencies between small firms and their environmental contexts. We dealt mainly with lagging regions and the questionnaires were used in 323 firms located in 12 different European rural regions of six countries. The quantitative approach used demonstrated the level of proximity between innovation and firms choices related to factors like: formation of the leadership, or labour skills, coordination with suppliers and clients, relationships with research institutions, external connections.

Key-words: - Small medium enterprise, rural, region, innovation, local development.

1 Tangible and intangible determinants of innovation

Contrarily to big firms, small medium enterprises (SMEs) interact intensely with the territory in which they locate, as a signal of their embeddedness. The particular tight links they develop with the external environment also reduce uncertainty risks. In general, SMEs do not only locate nearby the residence of their owners but also the geographical and sociological proximities constitute their main sources of assets and information. This fact determines the perspectives and strategic choices of the firms, because most of the market perception arises from the inputs that the territorial institutional context supplies them. Growth determinants as competition capability, political understanding, and knowledge or consumption behaviour do result from the external environment of the firm. Not surprising that the attributes of such environments become, therefore, a crucial factor for the development of entrepreneurship. Improving also inter-firm cooperation, the institutional framing is the better guarantee for the links between SMEs and its external environment. Not always such links conduct to the development of innovative activities in the firms, however. This is the main reason not to despise the internal sources of innovation as the formation of human capital and the level of networking aptitudes within the firm.

The contribution of SMEs to the territories is the other side of the coin in these analyses. The issue has long been developed by Maillat [10], who

pointed out the strategic role of the small firm for the local development, particularly if such firms do manage innovative activities. In this context, innovation in SMEs becomes a major issue for discussions related with regional development policies (see contributions of Vaz [13,14]. Is it possible to awake the need for innovation in SMEs and use them as incubators for local development? If so, how do firms behave when they are innovative? Which determinants have a more effective impact on the innovative choices of small firms?

In order to be able to answer the previous questions, a review on the complexity related to the phenomena of innovation comprehending a clear understanding of the tangible and intangible nature of its determinants is required.

One of the vertices towards which technical change, innovation and knowledge converge is the organisation's capacity to learn. Although intangible, such major driver can be related to factors internal or external to the firm, particularly if human capital can serve to perceive the nature of such learning capacity. In this study we have used as proxys of "the organisation's capacity to learn" the following variables: multiple characteristics of the top managers, skills and training for the workforce or other aspects such as interactions with suppliers, customers, industry associations and public support bodies. All these aspects do determine firms' capacity to innovate and shape several typical entrepreneurial behaviours worth investigating.

2 Methods

The present empirical analyses uses a set of enquires developed within the frame work of an European research project whose main goal was to model the determinants of innovation in a biunivocal relationship of interdependencies between small firms and their environmental contexts. We dealt mainly with lagging regions and the questionnaires were used in 323 firms located in 12 different European rural regions of six countries.

In this particular case, clustering techniques based on variables related to the history of the firm, sources of capital and governmental support characterised the three groups of firms as non innovators, innovators and followers. Their choices concerning firm leadership, skills of the labour force and interaction with other stakeholders, issues earlier discussed in the theoretical framework of this paper, have been studied and compared.

The food and drinks processing industry was selected as the observation field. The reason for this choice is that, in Europe this sector contemplates the presence of large numbers of small firms, many of them closely linked to both farming and household activities [4]. In this particular case, competitive pressures, economies of scale, and social change have developed the meaning of size over time [1] in the agro-food activity. Indeed, some authors emphasized this as its prevailing characteristic [12]. Knowing however from the existence of many small firms that survives due to choices in very narrow market segments, we argue to be in presence of a branch of activity with mixed tendencies: still, the classical model of scale economies prevails and already, some market niches are developing in presence of a new industrial model related to flexible production.

Usually this industry is defined as 'low tech' (OECD definition) integrating low levels of research and development expenditure, especially among smaller firms. Several reports from the EU [2] have shown that few employed within this industry had completed a higher degree. This suggests a tendency for the existence of lower skills in the sector. In spite of this and probably due to very severe market pressures the agro-food sector detains a significant rate in the introduction of new products and processes [3]. The existent dynamism in the process of innovation in the industry [11] must be accepted as a main form for competitive advantage [6, 7, 8]. Also, organisational innovation is being recognised [5] increasing the opportunities for smaller producers as consumers seek permanently differentiated food products [9]. New forms of marketing channels are being explored [15].

No doubt that the impact of such product, process and organisational innovation may play a particularly important role in motivating local economic development.

Several basic criteria served to guide the choice of areas to be observed:

- Administratively discrete: It was important to identify territories for which official economic data could be collected and, as far as possible, that the territories were at a similar level in the different areas.

- Lagging and peripheral: This was defined both economically and geographically. In economic terms, these were areas that had lower levels of economic development than the national average. From a geographical standpoint, there was particular interest in more remote areas where levels of communications infrastructure also compared unfavourably with other, more developed regions.

- Rural: The study focused on rural development and the place of the food industry within it and so it was important that the chosen areas were those in which agriculture played an important role. Territories dominated by large, urban populations were generally to be avoided.

- Contrasting: The two regions chosen in each case should provide contrasting developmental levels for comparative purposes.

Considering the multiple forms associated to the concept of innovation (product innovation, process innovation or organizational innovation) and accepting the hypothetical intangibility of the concept, the following list of indicators is suggested [13] to appreciate the level and type of innovativeness in the whole set of studied firms:

- Introduction of new or substantially modified products
- Introduction of new or substantially modified production processes
- Introduction of innovation at the level of:
 1. Product composition – new ingredients
 2. Product composition – new packaging material
 3. Visual appearance
- Introduction of organisational innovation (including management, marketing, financial structure, production, R&D, logistics or others)
- Newness of product innovation to the market

The quantitative approach uses such variables for an application of multivariate statistics, K-means clusters: three different firms' behavioural patterns have been detected. The history of the firms, their sources for starting capital and the way how governmental supports have been used contributed to the description of the clusters' main

characteristics. The forms how the firms in each of the different groups had used the sources of innovation permitted to distinguish them in non innovators, pioneers and followers.

The significance level of the innovation variables used was tested by ANOVA, Tests that all variables revealed a statistically significant contribution to the clustering process.

In a posterior exercise, the use of cross tab analyse served to detect clearer behavioural patterns in what concerns the intangible assets related to human capital. The results have been presented in spider graphs in order to facilitate a comparative evaluation.

3 Results

3.1 Behavioural patterns towards innovation

As earlier pointed out, the application of statistical analysis to the set of 323 firms, resulted in three distinct groups, each one representing a different behavioural pattern towards innovation. Table 1 gives us for each group the values of the key identification variables: indicators that measure the level and type of innovativeness. To note that for analytical purposes the value 1 indicates Yes (the referred cluster performs that type of innovation) and value 0 indicates No (the referred cluster does not perform that type of innovation).

Cluster 1 is composed by 86 firms and is mainly characterised by lack of innovation. Those firms belonging to the group only performed organisational changes inside their units. They are located essentially in the Portuguese regions Alentejo Central (19%), and Oeste (12%), the Belgium region of West Flanders (14%) and the Irish regions of South West (13%) and Border (11%). Please see Annex 1 for detailed information on the percentages of the other regions. They will be labelled as the Non-Innovators.

Cluster 2 is composed by 160 firms, representing the higher innovative level. The firms included in this group perform all the types of innovation listed previously. As their innovative initiatives are also new to the market, they will be labelled as Pioneers. Firms belonging to this cluster are mainly coming from The British areas of Devon/Cornwall (17%) and Hereford/Worcester (16%) and the Polish region Kuzawsko-Pomorska (15%).

Cluster 3 is composed by 77 firms and distinguishes from the other two due to two factors: the high level of innovation performed in the firms but, contrarily to the previous case, innovation developed is not new to the market. This is the reason why the group

as been labelled as Followers. This cluster is mainly composed by the French regions of Aude (27%) and Gard (14%).

Our research clearly indicates a negative correspondence between the firm age and its aptitude to innovate. Innovators registered the lower weight of firms with more than 10 years. Only in this group, new firms, with less than 5 years, were found. Non innovators are greatly composed by aged firms.

All the 3 groups mainly chose the option Personal or family idea when asked about the main sources of the original business idea. The same happened with the business location, with personal or family reasons predominating homogeneously. Considering that we are dealing with very small firms from agro-food sector, such choices based on familiar roots were to be expected.

Retained earnings were the mainly used source of capital for the 3 groups in a very similar way. This source was followed by bank loans, particularly in the case of Innovators (70% of firms in this group used this source). Followers were the ones that most asked for subsidies (29% against 14% from non-innovators and 10% from pioneers).

Regarding the used sources for innovative activities, and excluding the Non innovators, we can find some slightly differences between the two clusters performing innovation.

When improving production processes, in-house developments were the main starting point for both groups (58% of firms with affirmative answers in pioneers against 62% in followers). Equipment suppliers were indicated as the following main source of process innovation (35% for Innovators and 34% for Followers). Hereby, Innovators have a higher proportion of contacts abroad comparing with Followers. Also customers have a similar effect, however with less importance than the previous. For the Followers, more important than customers were similar firms (29% of firms in this group used this source), a natural source for imitators. Regarding the development of new products, again in house developments were the main used source (83% affirmative answers by Innovators and 62% by Followers). However, contrarily to what stated before, when developing new products, firms also use customers as an important source (57% by Innovators and 51% by Followers) as they function as drivers for innovation by ways of market pressure.

Table 1: Patterns of innovation - results from K-mean cluster analysis.

	1: Non-Innovators	2: Pioneer Innovators	3: Follower Innovators
Variables of innovation	N= 86	N= 160	N= 77
New or substantially modified products	0	1	1
New or modified production processes	0	1	1
New ingredients	0	1	1
New packaging material	0	1	0
Visual appearance	0	1	1
Organizational innovation	1	1	1
Newness of innovation	0	1	0

3.2 The organization’s capacity to learn in the behavioural patterns of small firms

In order to be able to better identify the importance of specific assets related to human capital we have observed in detail some of the attributes of the three clusters: characteristics of the top manager (TM), skills of the labour force and interactions with other agents internal or external to the region.

Figure 1 presents the relative perceptual heights of the different attributes that characterize TMs. The comparative graph identifies the three groups of firms, concluding about those characteristics that are more distant from the innovative behaviour: in this case they are very few and quite tenuous. In spite of the fact that Followers do have a higher number of TM with higher education this attribute does not seem to be a very determining one in what concerns different attitudes between Innovators and Non innovators.

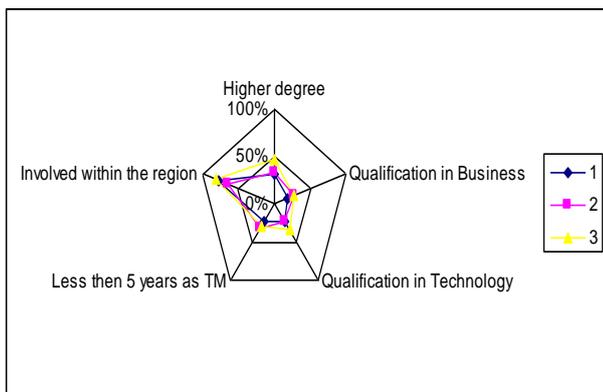


Figure 1: Characteristics of the TM

In any case still many firms do not have TM with higher education. In those cases when it exists, around 25% is formation in business or economics and 27% in technology or engineering. The Non innovators and Followers tend to hire more TMs in

the technological areas. Innovators and Followers have more TMs that are recent in their position (less than five years). Another attribute that we have analysed is the involvement of the TM to the region. It was very curious to observe that Innovators do not look for TM with regional involvement or provenience, on the contrary. This is not the case for the Followers, which from the three groups have the highest percentage of TMs with regional links.

Figure 2 represents the relative perceptual heights of those attributes determining the degree of formation of the labour force in the observed firms. Training carried out by the firms as well as qualified technical formation of labour were the selected items. The number of firms having less than 25% employees with technical qualification is very high in all the three groups of firms and it is clear that innovators do have more trained personnel than the other groups. Training is an attribute that serves better than technical qualification to distinguish the behavioural patterns. There is a clear higher number of firms to have carried out training (81%) in the group of Innovators then in the Non innovators or even Followers (55% and 68%).

Figure 3 helps to a better understanding of the role of the environment in the firm’s attitude towards innovativeness. If we compare the distance among the lines related to each group we realise that the interactions with other agents do represent determinants with a much higher level of significance to innovation than the previous two groups of attributes. This is the reason why we have disaggregated interactions (coordination) in internal and external to the region. We can point out that exchanges with suppliers located inside the region are less influent upon innovation. Still, the other set of considered factors is very important, particularly, when we compare Innovators and Followers to Non Innovators. Those two groups have very similar

attitudes regarding external relations and in both cases the relations with customers, with information technologies specialists and research centres detach them from the non innovators.

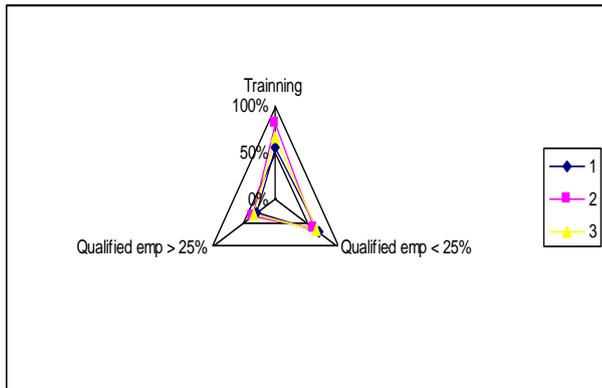


Figure.2: Skills of the labour force

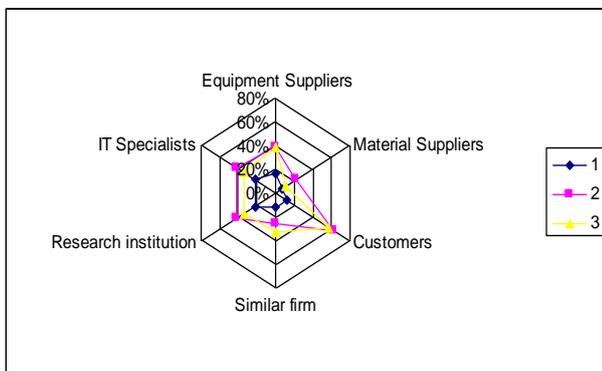


Figure 3: Interactions with other agents internal to the region

Figure 3 helps to a better understanding of the role of the environment in the firm’s attitude towards innovativeness. If we compare the distance among the lines related to each group we realise that the interactions with other agents do represent determinants with a much higher level of significance to innovation then the previous two groups of attributes. This is the reason why we have disaggregated interactions (coordination) in internal and external to the region. We can point out that exchanges with suppliers located inside the region are less influent upon innovation. Still, the other set of considered factors is very important, particularly, when we compare Innovators and Followers to Non Innovators. Those two groups have very similar attitudes regarding external relations and in both cases the relations with customers, with information technologies specialists and research centres detach them from the non innovators. The interactions with agents located outside of the region occur less frequently, therefore are not indicating so clearly the importance of interaction because they take place.

Nevertheless the tendencies persist. It is important to introduce the consideration of the example given by similar competitors that mainly in the case of interactions outside of the regions represent positive effects to innovativeness, particularly in the group of Followers. Figure 4 illustrates this argument.

Figure 5 illustrates how the three considered groups benefit from governmental assistance. This figure allows us to have very interesting conclusions: governmental support doesn’t seem to be directly correlated with innovativeness, although Followers (more than 40% of such firms) do need more support then Non-innovators or Innovators. A conclusion that is valid for the three considered forms of assistance: regional, national or from the European Commission (in which case this situation is more evident). The second conclusion is that independently from their behavioral pattern, firms tend to use more support from the national institutions then from the regional or European bodies. At last, we can observe that Non-innovators make, in general, much less use of governmental support at their disposal then others.

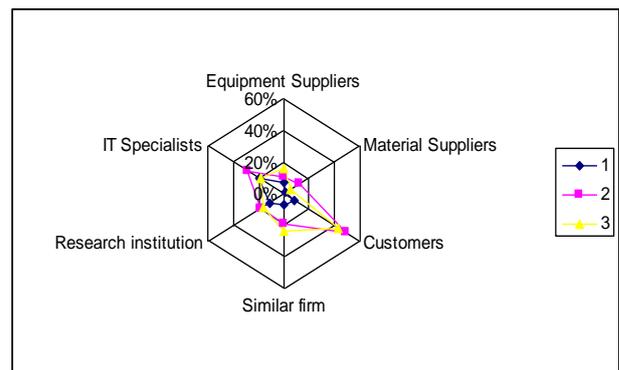


Figure 4: Interactions with other agents external to the region

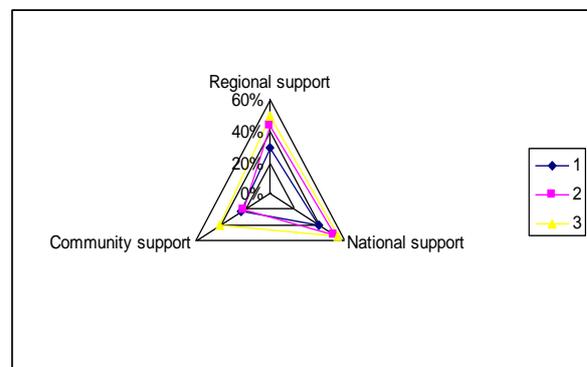


Figure 5: Governmental assistance

4 Conclusion

Regional analysts have explained the difference among the innovative capacity of regions as well as

the relation among the effort put in innovation and the level of regional competitiveness determined basically by the performance of firms. Many have been the methods to describe and identify those causes underlining the sequence of cause-effect relationships in this complex phenomenon. This paper suggests observing firms behavioural pattern regarding innovation, using an extended sample of small firms located in peripheral European areas and considering some of the most important factors related with firms' environmental conditions to learning.

The quantitative approach demonstrated the level of proximity between innovation and firms choices related to factors like: formation of the leadership, or labour skills, coordination with suppliers and clients, relationships with research institutions, external connections.

A detailed observation of the questionnaire would allow us to conclude new arguments like the importance of the quality standards imposed by clients in the achievement of stable relationships. This understated but powerful factor contribute significantly to increase the level of innovation of the small firm. The promotion of regional products or the interconnection of firms with chambers of commerce also increases the number of innovative actions taken by the small firm.

On the other side, curiously, the governmental support has served basically not to detect innovative profiles, but in many cases to generate financial viability in firms, suggesting an extended discussion about the economic efficiency of such aids.

References

- [1] Burns, J.A. (1983) A Synoptic view of the Food Industry, in J. Burns, J. McInerney and A. Swinbank (Eds.), *The Food Industry: Economics and Policies*, Heinemann, London.
- [2] European Commission (2000) *Panorama of European Business: data for 1988 – 99. Theme 4: Industry, trade and services*. Luxembourg: Office for Official Publications of the European Communities.
- [3] Galizzi, G. and Venturini, L. (1996) Product innovation in the food industry: nature, characteristics and determinants, in G. Galizzi and L. Venturini (Eds.), *Economics of innovation: the case of the food industry*, Physica-Verlag, Heidelberg.
- [4] Gellynck, X., Verbeke, W. and Viaene, J. (2003) Food processing, in Johnson, P. (Ed.), *Industries in Europe: competition, trends and policy issues*. Edward Elgar, Cheltenham.
- [5] Green, R. H., Lanini, L. and Schaller, B. (1996) Technical and organisational innovations in the food system: the case of fresh products in France, in Galizzi, G. and Venturini, L. (Eds.), *Economics of Innovation: The Case of the Food Industry*, Physica-Verlag., Heidelberg.
- [6] Grunert, K.G., Harmsen, H., Meulenberg, M., Kuiper, E., Ottowitz, T., Declerck, F., Traill, B. and Göransson, G., (2) (1997a) Innovation in the food sector: a revised framework, in Traill, B. and Grunert, K.G. (Eds.), *Product and Process Innovation in the Food Industry*. Blackie Academic & Professional, London.
- [7] Grunert, K.G., Harmsen, H., Meulenberg, M., Kuiper, E., Ottowitz, T., Declerck, F., Traill, B. and Göransson, G. (1997b), A framework for analysing innovation in the food sector, in B. Traill and K.G. Grunert (Eds.), *Product and Process Innovation in the Food Industry*, Blackie Academic & Professional, London.
- [8] Grunert, K.G. and Ottowitz, T. (1997) Neumarkter Lammsbäu: brewing beer for Greens, in B. Traill and K.G. Grunert (Eds.), *Product and Process Innovation in the Food Industry*, Blackie Academic & Professional, London.
- [9] Ilbery, B. and Kneafsey, M. (1999) Niche markets and regional speciality food products in Europe. Towards a research agenda, *Environment and Planning A*.31: 2207 –2222.
- [10] Maillat, D. (1991) PME et Systeme Territorial de Production, in C. Fourcade (Ed), *Petite Entreprise et Développement Local*. Editions Eska, Paris, 178 – 200.
- [11] Nicolas, F. M. and Vaz, M. T. N. (2000) State of art in instruments for local development, SMEs and VSEs, Public report D1, contract n° HPSE-1999-00024.
- [12] Smallbone, D., Cumbers, A., and Leigh, R. (1996) The single market process and SMEs in the UK food processing sector, *International Small Business Journal* 14, 4: 55- 71.
- [13] Vaz, M. T. N. (2004) The environmental context for small firms in the EU in Vaz et al. (Eds), *Innovation in Small Firms and Dynamics of Local Development*, Scholar Publishing House, Warsaw, 13-31.
- [14] Vaz, M. T. N., Cesário, M. and Fernandes, S. (2006) Interaction between Innovation in Small Firms and their Environments: An exploratory study, *European Planning Studies, Special Issue: Rural Development*, n°1/2006.
- [15] Verhaegen, I., and van Huylenbroeck, G. (2001) Costs and benefits for farmers participating in innovative marketing channels for quality food products, *Journal of Rural Studies*, Volume 17, n° 4: 443-456.