

Innovation Patterns in Spanish SMEs Operating in High Growth Industries

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Abstract: SMEs' degree of innovation depends on their relationships with institutions, processes, and agents. We explore the innovative orientation (product vs. process) of Spanish SMEs in order to gain a deeper understanding of such firms' competitiveness. A sample of 88 firms operating within industries characterized by higher potential for growth (creativity, open, digital, social, and green economies) provides empirical data. Cluster analysis applying a hierarchical method defines three main groups with different innovation types and degrees of intensity. Group 1, the largest in the sample, includes innovation followers. In group 2 we find product innovators, mainly in the creativity industry. Group 3 (the smallest, with 11 companies) includes the more innovative SMEs (characterized by innovation of a higher degree of intensity, and which falls into both categories). These are highly internationalized firms in the digital industry (with a "market pioneer" profile). Further research in other industries could provide larger samples useful to test our exploratory characterization of Spanish SMEs in high growth industries. Our study provides updated information about this population that may be of use to managers and policy-makers when trying to design and implement successful innovative strategies.

Key words: SME, Innovation, Spain, Growth

INTRODUCTION

A wide consensus among academics and policy-makers underlines innovation as a key driver of competitiveness, especially when Gross Domestic Product exhibits a low rate of growth.

Conventional wisdom has it that innovation is mainly a characteristic of larger firms, since such firms have substantial R&D budgets. Nowadays, however, in knowledge-based economies, small and medium-sized enterprises (SMEs) have gained momentum by developing services within industries with high potential for growth. Innovation literature has long featured work that focuses on the innovation intensity-firm size issue. For Pavitt *et al.* (1987) there are some advantages for higher firms in R&D, suggesting a U-shaped relationship between intensity of innovation and firm size; i.e., *relatively* large or small firms are more prone to innovation than medium-sized ones. Heterogeneous statistical definitions of the nature of an SME oblige us, however, to carefully consider the differences found in this respect between different countries, studies and time periods (Hong, S., 2012). Our research therefore attempts to facilitate the analysis of such differences by exploring the salient characteristics of innovative SMEs in Spain.

Any approach to SMEs' innovation strategies requires a clear definition of the terms concerned, because different constituencies could embrace diverse ideas under the same construct (Massa, S., S. Testa, 2008). It is thus perfectly possible to obtain two sets of opposite results from the same official statistical data, or from an analysis of entrepreneurs' and managers' visions.

Thus, new approaches are needed, because innovation in SMEs is obscured by the wide variety of phenomena linked to it (Edwards, T., 2005; Besic, C., 2011). We advocate the abandoning of normative statements, and the embracing of an open-minded view focusing on SMEs' behavior in relation to strategic innovation within the existing institutions, processes, and structures. Along these lines, we thus contribute to an exploratory analysis of the orientation of innovative activity (product vs. process) in a sample of Spanish SMEs. Our findings may help to enhance the competitiveness of this kind of firm.

Literature Review:

SMEs' innovativeness is linked to their propensity to learn from different sources, and also to adopt ideas coming from inside or outside existing markets. In terms of the essential nature of the concept of innovation, a traditional closed innovation model would attribute to SMEs a whole set of behavior patterns and processes, while an open innovation model would consider that enterprises harness their creativity from both internal and external sources (Chesbrough, H., 2003). The implication is that if SMEs embrace such a vision, they may be considered to have a relevant role in contemporary innovation processes.

A clear vision of the dividing-line between product-based and process-based innovation strategies in SMEs will try to identify the degree of originality present in the innovative process while taking into consideration the presence or absence of product innovations. Even when the distinction between radical and incremental

innovations is a controversial area, one of the trends present in the literature will be to analyze the impact of various forms of organizational learning on the degree of originality found in the innovative process.

Another approach to the analysis of product-based or process-based innovation in SMEs is offered by Laforet & Tann (2006), when they conclude that organizational innovation (i.e. innovation in one's way of working) is more relevant than product innovation when it comes to explaining the behavior of manufacturing SMEs.

The main obstacles to SMEs' product innovation strategies are the cost of the development projects, and the uncertainty of market acceptance (March-Chordà, I., 2002). They suggest that the average time spent on new product development is surprisingly short in SMEs: about six months.

To complete our review of the relevant literature's findings in relation to innovation processes in SMEs, it is pertinent to refer to the ideas of De Jong, Bruins, Dolfsma & Meijaard (2003) concerning innovation in service firms. They consider that (id: 16) innovation in service industries is often non-technological, and that it mostly involves small, incremental changes in processes and procedures. Many service innovations are not very radical and have often already been implemented in or by other service organizations.

Ouwerling (2002) compiles from the literature a series of differences between the innovation found in service industries and that found in manufacturing. The main differences he notes are as follows: service innovations require relatively less R&D than their manufacturing counterparts; service firms tends to invest less in fixed assets to develop innovations; service firms invest a lower percentage of their revenue than manufacturing ones; service innovations are easier to imitate than manufacturing ones; the firm's human resources strategy plays a key role in the success of new services; technology is less important for new service development (NSD); service-based innovation usually requires changes in the delivery process and client interface; the main barriers to the success of service-based innovation come from the organizational sphere.

In relation to the service sector, innovation has its own specific features, so that the conventional methods employed to analyze innovation in manufacturing do not apply here (Tidd, J., 2005). Menor *et al.* (2002) define innovation as an offering not previously available to customers that derives from an addition or a change to the concept of a service.

We take the above ideas into consideration when dealing with our empirical data in the following section.

Methods:

Questionnaire Design:

The questionnaire (concerning the types and intensity of innovation) was made up of 30 questions. The concepts concerned have already been defined by the OECD (2005). Thus, the types of innovation occurring are related to Product, Process, Organization and Marketing. In the case of degrees of innovation, the variables applied are Incremental and Radical. The responses to the questionnaire were obtained using a Likert scale ranging from 1 to 5 (1: minimum value; 5: maximum value).

Sample and Data Collection:

The sample is a convenience one. Participants were selected from among innovative companies in five different industries, as defined in the unconventional way employed in the Spanish Law concerning Economic Sustainability (Law No. 2/2011, dated March 4, 2011), and with all having a high potential for growth.

The questionnaire was administered to the respondents during the summer of 2010.

A total of 88 responses were obtained. The demographic characteristics of the firms are summarized in Table 1.

Results:

A cluster analysis was performed using a hierarchical method. The results showed the existence of three main groups of organizations.

In order to validate the cluster solution, a number of analyses were performed. Firstly, a discriminant analysis revealed that 99 % of the cases originally grouped together had indeed been correctly classified. Cases that had been badly classified were corrected and as result, 100% of the cases were classified in the appropriate group. The first group contains 69% of the companies, the second contains 18%, and the third group covers 13% of the total.

Secondly, an ANOVA analysis was carried out and significant differences were found between the third clusters in all the innovation variables, except in the case of product innovation (see Table 2). Table 2 provides the average scores of each group and variables for the variables used to obtain the cluster. In addition the ANOVA significance test was also included.

Table 1: Demographic characteristics of the firms.

Industry		
	Number	%
Open economy	20	22.73
Digital economy	20	22.73
Social economy	13	14.77
Green economy	16	18.18
Creativity	19	21.59
Sector		
Manufacturing	11	12.5
Services	77	87.5
Size (number of employees)		
0 to 9 employees	38	43.18
10 to 49 employees	29	32.95
50 to 250 employees	21	23.86
Age		
Less than 10 years	44	45.7
Between 10 and 25 years	30	35.3
More than 25 years	5	9.5
No data	9	9.5
Capital ownership		
Private		84
Public		4
Nationality		
Spanish		83
Foreigner		5
Activity Field		
Nationwide		100%
International		58%
Global		24%

Table 2: Average and ANOVA cluster.

Variables	Average by group			Total Average	Anova Sig.	ANOVA Sig.
	Group 1 N= 61	Group 2 N=16	Group 3 N=11			
Type of innovation						
Product	4.19	4.25	4.18	4,21	.985	.985
Process	3.93	2.12	4.18	3,41	.000	.000
Organizational	3.67	2.00	3.90	3,19	.000	.000
Marketing	3.32	2.37	3,45	3,05	.010	.010
Intensity of innovation						
Incremental	3.67	3.00	3,72	3,46	.005	.005
Radical	3.14	2.12	3,27	2,84	.017	.017
Descriptive variables						
Size (mean)	35	26	65	42	.139	.139
Age (in years)	13	14	8	13	.134	.134
Main Industry	Mixed	Creativity	Digital			
Main Activity Field % firms on the cluster	International 65.6%	International 87.5%	International 100%			

Discussion and Conclusion:

The three groups resulting from the cluster analysis indicate three different types of organizations in terms of both type and intensity of innovation.

Group 1:

This group is made up of 61 companies representing 69% of the sample, the largest by far of the groups identified. These organizations have, on average, the medium values in relation to all types and degrees of innovation. This group is not homogeneous, in the sense that it contains some companies from all sectors studied and therefore, in some respects the organizations could behave in a very different way from one another and could not be jointly defined, as is the case for the other groups. Furthermore, this group contains medium values in relation to the age and size of the companies, but a lower than average percentage of companies operating in international markets. The companies in this group could be considered as followers (Naranjo-Valencia, J., 2011).

Group 2:

The second group is made up of 16 companies, representing 18% of the sample. This group has, on average, the lowest values in terms of both type and degree of innovation, with the exception of product innovation. It has the highest value for this type of innovation, because this group contains 75% of the companies chosen from the creativity industry. This sector is characterized by product innovation as its basic strategy. These organizations are the smallest and oldest found in the sample. This study also found that these smaller firms have developed more product innovation than other types of innovation (Zhou, H., 2010). The average international companies is very high; exporters and are more likely to be product innovators, and better able to market their product innovations because, when the firm develops a new product and has access to several markets, it is easier for the firm to spread the new product more efficiently (Therrien, P., 2010). Moreover, in this group there is a predominance of companies within the creativity industry. This industry is characterized by strong competition and quite short product life-cycles, which is why companies need to try to improve and innovate so as to differentiate themselves and to survive in the market.

Group 3:

In this group there are only eleven companies, representing 12.5% of the sample. Organizations belonging to this group operate in the digital industry. This group is the most innovative of the sample, with higher values in both types and degree of innovation. All the companies in this group are international firms. Moreover, these companies are the largest ones in the sample. This study confirms previous research by which the digital industry has been found to be the most innovative sector in terms of both type and degree of innovation (Therrien, P., 2010). Larger companies used to be the most innovative because they have access to more internal and external resources. This is why this group is called "market pioneers" (Naranjo-Valencia, J., 2011). This type of company is used to protecting its innovations through industrial property rights, with the aim of obtaining long term incomes by their exploitation (Zindovic, I., 2012).

In summary, we have detected three types of innovative SME in terms of higher growth potential. The largest group includes followers with medium innovation intensity levels. The second group consists of "product innovator" SMEs operating within the creativity industry. The last group brings together "market pioneer" firms in the digital industry; these SMEs are highly internationalized, and show considerable innovation intensity. Our results could be useful both for policy-makers and for SME managers, in their search for more profitable innovation strategies. Our study's limitations are related to its exploratory character, and to the structure of the sample. To overcome them, wider samples in other industries could point to links between the identified innovation typologies and firms' performance.

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