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**TÍTULO DE LA COMUNICACIÓN: SME sectors in backward regions: Is  
“small” always “beautiful”?**

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In the last two decades, small and medium-sized enterprises (SMEs) have drawn the attention of policy-makers as a source to promote economic growth and lower unemployment rates. This interest has been stimulated by different studies showing SMEs to be dynamic and contributing significantly to economic growth, job creation and innovation (Birch 1979, Acs and Audretsch 1987, Giaoutzi 1988, Storey 1988, Davis *et al.* 1996, Carree and Thurik 1999, Beck *et al.*, 2003, Johansson 2004, Carree *et al.* 2007). However, the highly-developed regions or nations do not necessarily exhibit higher rates of firm creation or larger SME sectors (Bosma and Harding, 2007). Thus, certain qualitative characteristics of the entrepreneurs and SMEs might explain their different contributions to economic growth and regional development.

The current paper explores the relationship between the regional levels of development and the characteristics of the SME sectors. Thus, our aim is to compare the composition of the SME sector in backward areas and in comparatively advanced ones in order to identify which type of SME is the most effective at boosting economic growth. The empirical analysis uses data from 663 SMEs in four Spanish provinces: on the other hand, Badajoz and Cádiz –as examples of relatively backward ones and, on the one hand, Álava and Valencia –as examples of comparatively advanced ones. These data were obtained through surveys conducted among managers/owners of SMEs who were personally interviewed. The questionnaire employed provided us with information

about different dimensions of the SMEs' performance, such as the relations with clients and suppliers, the spatial origin of the intermediary purchases, the spatial destination of the firm's sales and other variables of entrepreneurial orientation (for instance, cooperation and innovation activities). Using these data, we aim to identify different patterns of performance for SMEs in the high-income and low-income provinces considered in the study. In order to do so, we estimate a logistic regression model, which predicts the location of the SMEs in the backward provinces -versus the comparatively advanced ones- based on the SMEs' characteristics. Among other results, the analysis shows that SMEs in backward areas have significant structural weaknesses related to their lack of bargaining power (a high proportion of inputs/outputs comes from a small number of suppliers/buyers) and their disadvantaged situation in the value chains (the SMEs acquire a large part of their inputs outside of their territorial location and their sales are mainly oriented towards the internal market).

## **1. INTRODUCTION**

In the past two decades, entrepreneurship and SMEs have merited increasing attention by academics and policymakers (Wennekers and Thurik, 1999; Reynolds et al., 2002; Audretsch et al., 2006). This interest has been stimulated by different studies showing SMEs to be dynamic and contributing significantly to economic growth, job creation and innovation (Birch, 1979; Storey, 1994; Carree et al., 2007).

In this respect, research based on data from the Global Entrepreneurship Monitor (GEM) has shown the existence of a relationship between entrepreneurial activity and economic growth (Reynolds et al., 2002). However, the highest rates of entrepreneurial activity are generally found in developing economies and the relationship between total entrepreneurial activity and per capita income is curve shaped. Thus, nascent entrepreneurship declines with per capita income until a certain turning point, after which entrepreneurship increases again. In this respect, Stam et al. (2007) suggest that entrepreneurs with "high expectations for growth" contribute more to national economic growth than entrepreneurs in general. Similarly, Guzmán and Santos (2001) defend that the situation of backward areas is related to the manner in which local entrepreneurs perform their functions. From this perspective, not only is the number of entrepreneurs an important factor, but also the characteristics of these entrepreneurs. However, research in the field of entrepreneurship has not sufficiently explored the qualitative aspects that make up the "quality" of the entrepreneurs. In the same way, there is not a

direct and clear relationship between the size of the SME sector -in terms of contribution to total GDP or employment- and the per capita income. However, different studies have shown that SMEs in highly-developed areas are more innovative, more internationalized and more efficient than those in backward areas. In this respect, the crucial factor for economic development is not only the number of SMEs, but also their “quality”.

From this perspective, this paper explores the characteristics of the SME sectors in regions with different levels of development. In order to do this, the concept of "entrepreneurial quality" (EQ) will be defined from a set of characteristics of the entrepreneurs and SMEs which determine better economic performances of the production units operating in a specific area. In this work the hypothesis of the existence of a relationship between the regional levels of development and the EQ of the SME sectors will be put forward. This hypothesis will be tested using data from a survey among SME managers/business owners in four provincial economies in Spain: two backward ones –Badajoz and Cádiz- and two, comparatively, advanced provinces –Álava and Valencia.

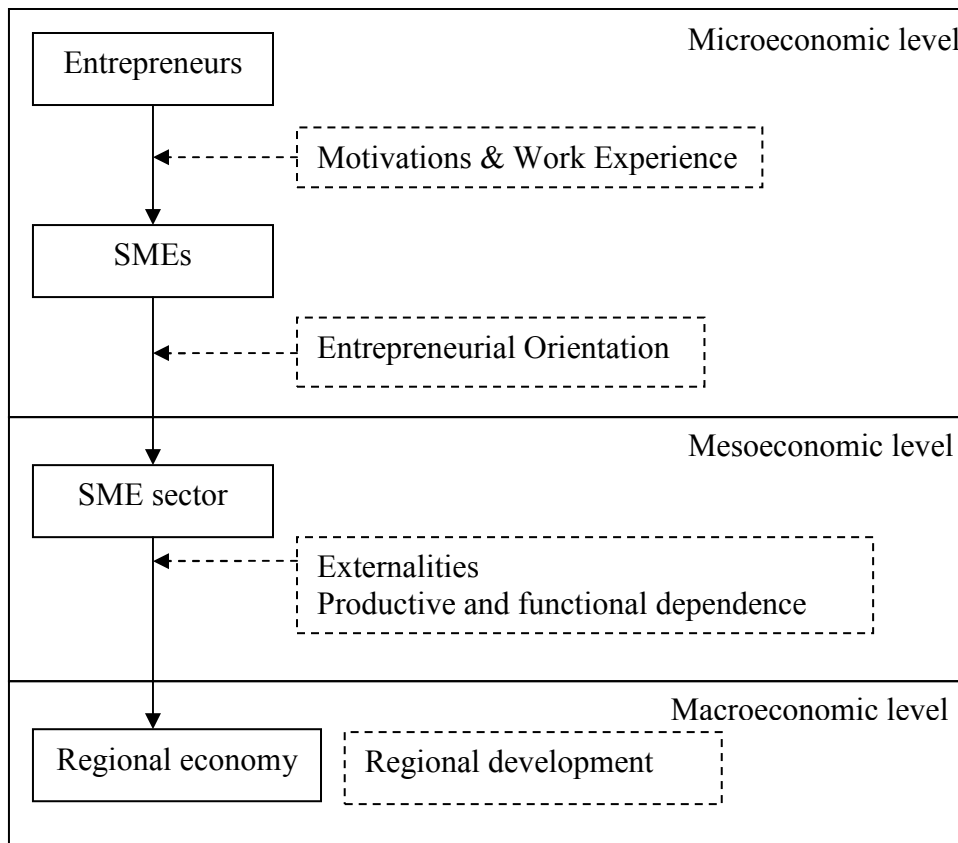
The paper is organized as follows. The second section reviews the literature and proposes a theoretical framework to delimitate the notion of “entrepreneurial quality”. The third section is devoted to the empirical analysis. Next, some conclusions and policy implications are presented to end the paper.

## **2. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK**

As was said before, the aim of this paper is to compare the composition of the SME sector in backward areas and comparatively-advanced ones in order to identify which type of SMEs is the most effective at boosting economic growth and job creation. In order to do this, an analysis of entrepreneurship at various levels, as proposed by Wennekers and Thurik (1999), is the most appropriate approach. Thus, from a *microeconomic perspective*, there are certain characteristics of the individual entrepreneurs and SMEs that delimitate their EQ. In this respect, entrepreneur’s previous work experience and motivations, on the one hand, and different dimensions of the SME’s entrepreneurial orientation (EO), on the other hand, will be specifically considered in this paper. From a *mesoeconomic perspective*, these characteristics - globally observed for all the SMEs within an economy- shape the EQ of the SME sector in a specific area. However, the EQ of the SME sector is not exclusively determined by the aggregation of the characteristics of individual agents. External effects also play a

significant role, particularly those associated with productive linkages between firms. In this respect, it is necessary to consider the situations of dependence that are often generated in the relationships between suppliers and clients within the value chains influencing firm growth and profitability. Finally, from a *macroeconomic perspective*, the EQ of the SME sector affects the economic growth and employment creation in a territory (see Figure 1).

Figure 1. Analytical framework



### 2.1. Entrepreneurs’ personal characteristics: Motivations and work experience

When analyzing the EQ of the SME sector, it is important to consider the cognitive dimension of the entrepreneurs because this influences their behavior before and after starting up. Cognitive models have made up one of the most important approaches to explain entrepreneurship (Krueger and Carsrud, 1993; Mitchell et al., 2002; Fernández et al., 2010). The cognitive approach emphasizes the fact that everything we say or do as human beings is the result of a mental process, in which motivations, perceptions and attitudes have an important role (Krueger, 2003). The studies which first developed the cognitive approach to entrepreneurship were those focused on motivation (McClelland, 1961). Motivation can be defined as the set of reasons that prompt individuals to engage in a particular behaviour, for instance, starting up a business (Shane et al., 2003).

Different taxonomies of motivations have been proposed in the literature. One of the most usual and relevant ones differentiates between intrinsic and extrinsic motivations (Liñán and Santos, 2007). Intrinsic motivation is close to the need for achievement referred to by McClelland (1961). An intrinsic entrepreneurial motivation poses that entrepreneurs develop their activity for the mere pleasure of carrying it out, that is, for vocational reasons or for the need of personal development. On the contrary, extrinsic entrepreneurial motivation implies the entrepreneurs' activity being driven by the desire of gaining an economic reward or making a material achievement. According to the literature, those entrepreneurs with an intrinsic motivation are more prone to the adoption of energizing business behaviours (Ajzen, 1991; Krueger and Casrud, 1993). This type of entrepreneur tries to do more difficult tasks, reach a greater conceptual learning, strengthen their creativity, is more persistent in their behaviours and has an inclination to positive emotions. Consequently, higher intrinsic motivation might stimulate innovation, cooperation, ambition and a long-run vision in SMEs (Guzmán and Santos, 2001).

Another classification can be found in the literature which differentiates between “necessity” and “opportunity” motivation. Opportunity entrepreneurs are viewed as entrepreneurs who start a business voluntarily in order to pursue an opportunity, whilst necessity entrepreneurship is more requirement-based. In comparison with necessity entrepreneurs, opportunity entrepreneurs have usually prepared their entry into self-employment on a more solid basis and they start their businesses in an area of their particular expertise. These factors lead to a longer survival time and a higher business growth in the case of opportunity entrepreneurs who have also higher growth aspirations. Thus, countries with a low ratio of opportunity to necessity entrepreneurs also have a low GDP per capita (Reynolds et al., 2002).

In addition to these considerations regarding motivations, clear empirical evidence shows that previous work experience has a positive influence on the entrepreneur's decision to start up (Lin et al., 2002; Lazear, 2004 and 2005). In the same way, previous professional background influences the development of the business activity after its creation. Working experience constitutes a learning process through which entrepreneurial skills can be acquired and social networks useful for future business activities can be developed (Cooper, 1985). However, in backward areas self-employment is frequently the only option for people who cannot find a job. These ‘necessity entrepreneurs’ lack the work experience which could help them to succeed and expand their business initiatives.

In this respect, we propose in this paper the following two hypotheses:

*H1: There is a higher presence of entrepreneurs with an extrinsic and necessity motivation in backward regions than in comparatively advanced ones.*

*H2: There is a lower presence of entrepreneurs with previous work experience as employees in backward regions than in comparatively advanced ones.*

## **2.2. Entrepreneurial Orientation (EO)**

Miller (1983) characterized an entrepreneurial firm as that one which “engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with ‘proactive’ innovations, beating competitors to the punch”. Later research has extended and modified this concept of EO by Miller (Covin and Slevin, 1991; Lumpkin and Dess, 1996).

Three main dimensions of the EO have been established in the literature: innovation, proactivity and taking risks. However, certain authors have considered other variables within the concept of EO, capturing different characteristics and behaviours that shape entrepreneurial attitude or organizational strategy (Stevenson and Jarillo, 1990; Lumpkin and Dess, 1996; Brown et al., 2001). For the objectives of this paper, the following three aspects will merit attention:

### **a) Innovation**

A core dimension of EO is innovation (Covin and Slevin, 1991; Zahra and Covin, 1993; Lumpkin and Dess, 1996). In this context, Covin and Miles (1999) identified four types of innovations related to firms’ EO, while Lumpkin and Dess (1996) emphasized the classification developed by Downs and Mohr (1976) distinguishing between innovation "product market" -which puts the emphasis on product design, market research and advertising and promotion- and innovation "technology" -characterized by the development of new products and processes.

### **b) Proactivity**

Miller (1983) pointed out proactivity as a dimension of business strategy that allowed entrepreneurs to act in advance by adopting an aggressive behaviour compared to their rivals. “Proactive” entrepreneurs differ from “reactive” entrepreneurs who only respond to previous changes in the market or their business environment (such as new technologies and innovation, changes in competition or customer tastes). Lumpkin and Dess (1996) consider that proactivity and reactivity are both opposite concepts to

“passiveness”. The latter one poses a behaviour of indifference or inability to grab opportunities or take the lead in the markets (McMullen et al, 2007).

Miller and Friesen (1978) consider proactivity as the ability to find and exploit new products and market opportunities before competitors. This consideration of proactivity has been developed mainly in Stevenson’s works, which studied the organizational processes directed towards finding new business opportunities for the company (Stevenson, 1983; Stevenson and Jarillo 1990).

### **c) Cooperation**

Cooperation can also be considered as a dimension of the entrepreneurship quality (Guzmán and Santos, 2001; Santos and Liñán, 2007). By means of collaboration with other companies, SMEs can strengthen their competitive position in the market and grow faster. The importance of cooperation has been particularly revindicated in the light of the phenomenon of flexible specialization in central and northeastern Italy (the “Third Italy”). The spontaneous cooperative networks of small local firms were essential for the economic success of the Italian industrial districts (Guerrieri et al., 2001; Markusen, 1996; Pyke et al., 1991).

Cooperative behaviours are especially useful for SMEs, which can benefit, in this way, from some of the advantages of large firms without losing the flexibility characteristic of small companies (Pyke et al., 1991). Cooperation can be carried out through formal agreements with other firms or through informal agreements, based on personal networks of contacts.

Based on these ideas, the following hypothesis can be proposed:

*H3: SME sectors in backward areas are characterized by a lower proportion of innovative, proactive and cooperative SMEs in comparison with those in highly-developed regions.*

### **2.3. Firm dependence**

As was previously said, the EQ of the SME sector cannot be approached as a mere aggregation of the individual characteristics of the SMEs within a territory. Thus, at the meso-economic level of analysis, it is also necessary to pay attention to the external effects originated by individual firms and affecting other companies. In this respect, the relationships between large companies and SMEs are specifically relevant. Particularly, the contribution of SMEs to regional development may differ according to their pattern of integration in value chains.

From this perspective, Romero and Santos (2007) have proposed a firm typology based on the spatial patterns of firms' linkages which differentiated among domestic firms, dependent SMEs, exporting SMEs, extravert SMEs, large propelling firms, large firms orientated to the internal market and large enclave firms. Furthermore, they have defended the existence of a relationship between the composition of the production system in terms of this typology and the level of regional economic development.

From a slightly different perspective, Guzmán-Cuevas et al. (2009) have proposed the notions of functional dependence and productive dependence to approach the role of SMEs in economies with different levels of economic development.

### **a) Functional Dependence**

This new concept points out the dependence of the enterprise system in an economy with respect to other territories. The origins of this concept can be found in Hirschman's analysis (1958) of the forward and backward linkages between sectors. However, functional dependence differs from this approach in its focus on dependence between firms -instead of between sectors. Other antecedents of this concept can also be found in the approaches of value chains (Porter, 1985; Gereffi, 1999), "value stream" (Womack and Jones, 1996), or even in the traditional French concept of "filière" (Aujac, 1960).

Studying functional dependence implies considering the geographical origin of a firm's inputs (purchases) and the geographical destination of its outputs (sales) differentiating between the local, regional, national and foreign markets. Thus, the maximum degree of functional dependence would be represented by a firm purchasing all its intermediary inputs in the foreign market and selling all its production in the local market. Conversely, the minimum degree of functional dependence (in other words, a maximum degree of functional autonomy) would be represented by a firm acquiring all its inputs in the local market and exporting all its output.

According to Guzmán-Cuevas et al. (2009), a high level of functional dependence represents a weakness for a regional economy and poses a limitation, from a macroeconomic perspective, to the generation of added value and employment in the region. A great presence of functionally-dependent firms would imply that firms in the area do not benefit from pull effects causing a multiplying impact for the whole economy. By contrast, a production system characterized by a large presence of functionally-autonomous firms would be associated with a higher growth potential –due to the orientation to export markets- and a greater capacity to generate spillover effects through backward linkages.



## **b. Productive dependence**

Productive dependence is a characteristic of firms that has not received sufficient attention, though Porter (1985) pointed out the buyer and supplier power, among the forces influencing competition in an industry. The concept of productive dependence refers to the degree of concentration of the firm's purchases and/or sales from/to a small number of suppliers and/or customers. An extreme situation of backward productive dependence would be observed in the case of a firm which purchases all its inputs from only one supplier. Analogously, an extreme situation of forward productive dependence would be associated with a firm which concentrates all its sales on only one client, for instance, a firm working exclusively for another company through a subcontract agreement.

A high forward or backward productive dependence situates a firm in a vulnerable position, as the majority of its outputs and inputs are subject to decisions and circumstances outside its control that, in extreme cases, might even put the firm's activity at grave risk. Moreover, these situations of dependence imply a limitation for the SME's bargaining power and, in consequence, for the firm performance. Furthermore, from the macroeconomic perspective, an excessive productive dependence represents a weakness for the production system, especially characteristic of backward economies. This would imply the existence of many firms, often of very small size, acting as official dealers, franchises, concessions, etc., subordinated to large corporations. In highly-developed economies the number of subcontractors, distributors, franchisees, licensees, etc. is also significant, but they coexist with a larger number of productive autonomous firms with a diversified structure of clients and suppliers with which they can use a strong bargaining power (Guzmán-Cuevas et al., 2009).

In this respect, we formulate in this paper the following hypothesis:

*H4: Backward regions are characterized by a larger presence of functionally and productively-dependent SMEs, whereas highly-developed regions are characterized by a large presence of functionally and productively-autonomous SMEs.*

## **3. EMPIRICAL ANALYSIS**

In this paper these hypotheses will be tested using data for SMEs in four Spanish provinces: Badajoz, Cádiz, Valencia and Álava. Two of these provinces -Cádiz and Badajoz- which are located in the south of Spain, are among the least developed economies in Spain, while Álava, in the north of Spain, and Valencia, on the Mediterranean coast, are comparatively advanced economies.

Table 1 shows data regarding per capita income and provincial unemployment levels. As can be seen, Álava and Valencia have a higher income level: Valencia is around the average per capita income in Spain and Álava is the richest province of Spain. Both have unemployment rates below the national average rate, particularly in the case of Álava. On the contrary, Badajoz and Cádiz present GDP per capita and unemployment rates far lower than the Spanish average.

**Table 1. Some indicators for the provincial economies. 2007**

	<b>Badajoz</b>	<b>Cádiz</b>	<b>Valencia</b>	<b>Álava</b>
Population (n° inhabitants)	678,459	1,207,343	2,486,483	305,459
GDP per capita (euros)	15,991	18,556	21,790	33,998
Unemployment rate (%) <sup>1</sup>	14.12	14.91	8.14	4.96
Business establishments (per 100 inh.)	6.6	6.09	8.29	7.54
Average number of workers per firm	8.93	9.35	9.94	12.58
SMEs (with 1-249 employees) (% of the number of firms)	99.76	99.69	99.70	99.60
Workers in SMEs (with 1-249 employees) (% of the number of workers)	72.19	71.32	73.41	68.38
Agriculture (% of total employment)	9.15	3.52	2.85	1.48
Industry (% of total employment)	11.31	10.61	18.76	32.95
Construction (% of total employment)	13.54	13.54	14.35	8.52
Services (% of total employment)	66.00	71.95	64.03	57.05

Source: Calculated from data of the National Institute of Statistics and the National Institute of Social Security.

(1) Annual average.

(2) Average of the annual growth rate in real terms calculated using the consumer prices index for each province.

In addition, other differences between the production systems of these economies can be observed in Table 1. Álava has the larger industrial sector, whereas Badajoz comparatively shows a specialization in agriculture and Cádiz in services. The backward economies, Badajoz and Cádiz, are characterized by a lower average firm size in comparison with the advanced ones and a lower business density (establishments per 100 inhabitants). However, there is no a clear relation between the size of the SME sector and the level of per capita income. The larger SME sector -in terms of its contribution to total employment- is observed for the case of Valencia, whereas the smallest SMEs sector is the Álava's one (and these are the two richest economies among those included in this study).

The empirical analysis in this section will test the existence of disparities among both groups of provinces with regard to the characteristics of their SME sectors. The aim of

this analysis is to check whether the comparatively-backward economic situation of Badajoz and Cádiz might be associated with an inferior EQ of their SME sectors.

### 3.1. Data and methodology

Data used for this analysis have been obtained from a survey carried out among business owners -assuming also managerial functions- of 663 SMEs located in the provinces of Badajoz, Cádiz, Valencia and Álava. The fieldwork was undertaken during the last quarter of 2007 in Badajoz and Álava and the first quarter of 2008 in Cádiz and Valencia and was based on personal interviews. The target population was SMEs with at least one worker and up to 250 employees. The questionnaire incorporated questions to measure motivations, firm EO, firm dependence and different control variables. The final sample includes 200 observations for Cádiz, 153 for Badajoz, 222 for Álava and 88 for Valencia. Therefore, there are 353 for backward areas and 310 observations for comparatively advanced provinces. Some firm characteristics for each group are summarised in Table 2.

The *dependent variable* is the *location of the SMEs (loc)*, differentiating between backward areas and comparatively advanced ones. Thus, this dichotomous variable takes value 1 for those SMEs located in Badajoz and Cádiz and 0 for those located in Álava and Valencia. The *independent* or *explanatory variables* in this analysis can be classified into four types:

**Table 2. Some descriptive indicators**

	Number	%	Firm Age (average)	Firm Size (average)	High-tech. industries	Low-tech. Industries	Construction	Advances Services
Backward	353	53.2	14	10	48.4%	58.8%	60.0%	33.9%
Advanced	310	46.8	19	20	51.6%	41.2%	40.0%	66.1%

a) Control variables:

1. *Firm Age (age)*: number of years of activity (at the moment of the interview) since the creation of the firm (continuous variable).
2. *Firm Size (size)*: firm size measured using the number of employees (continuous variable taking values from 1 to 250).
3. *Construction (const)*: this variable takes the value 1 for the firms operating in the construction sector and 0 for the rest (dichotomous variable).
4. *High technological industries (high\_tech)*: this variable takes the value 1 for the firms operating in high and medium-high technological manufacturing and 0 for the rest

(dichotomous variable). The specific industries included in this category are listed in the Appendix.

5. *Low technological industries (low\_tech)*: this variable takes the value 1 for the firms operating in low and medium-low technological manufacturing and 0 for the rest (dichotomous variable) (see again the Appendix for an exhaustive list of the industries included in this category).

6. *Advanced business services (adv\_serv)*: this variable takes the value 1 for the firms operating in advanced service activities and 0 for the rest (dichotomous variable) (see also the Appendix).

#### **b) Entrepreneurs' personal characteristics:**

In this respect, two factors are considered in this paper: the nature and strength of the entrepreneurs' motivations and their previous work experience.

Regarding *motivations*, the business owners/managers interviewed were asked about their level of agreement with the following seven statements related to their motivations for running a business:

- "I run a business because this is the best option for my personal and professional development."
- "I run a business because I want to be my own boss."
- "I run a business because I wanted to take advantage of a good economic opportunity."
- "I run a business because this way I earn more money than working as an employee."
- "I run a business because I did not have another option (I was unemployed)."
- "I run a business because I had to complement the family income."
- "I run a business because I have to continue with a family business."

The answers were coded using a Likert scale with 7 items (from 1 meaning absolute disagreement to 7 meaning full agreement). Since there were certain correlations between these variables, a principal components analysis was carried out in order to work with a lower number of uncorrelated variables to be used in the regression model. As a result of this factor analysis, the three following vectors were obtained, which explain 66.2% of the total variance:<sup>1</sup>

Table 3. Entrepreneurial motivations. Factor analysis

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<sup>1</sup> The value of the Kaiser-Meyer-Olkin statistic was 0.675 and the Barlett's sphericity test showed a significant value for the Chi-square, confirming that the correlation matrix was non-random. All the communalities have values higher than 0.55.

	Components		
	1	2	3
This is the best option for my personal and professional development	<b>,611</b>	-,371	-,048
I want to be my own boss	<b>,732</b>	-,062	,039
I wanted to take advantage of a good economic opportunity this way I earn more money than working as an employee	<b>,763</b>	,136	,033
I run a business because I did not have another option (I was unemployed)	<b>,820</b>	,119	,081
I had to complement the family income.”	-,056	<b>,744</b>	-,379
I have to continue with a family business	,164	<b>,790</b>	,188
	-,153	,111	<b>,927</b>

7. *Autonomy and opportunity motivations (aut\_mot)*: This vector explains 31.6% of the total variance and it is made up of the first four motivations proposed which are related to the desire of autonomy and the attempt at exploiting attractive business opportunities (as can be seen in Table 3 which show the factorial loading of each vector).

8. *Necessity motivation (nec\_mot)*: This vector explains 15.2% of the total variance and it includes two motivations related with necessity situations, that is, those who run a business to escape from unemployment and those who need to complement the family income.

9. *Continuity motivation (cont\_mot)*: This vector explains 19.4% of the total variance and is exclusively made up of the variable capturing the business owners who run a family.

10. *Work experience (exper)*: This dummy variable takes value 1 for the interviewed who had previously worked as an employee before running their current business and value 0 in the negative case.

### c) Entrepreneurial Orientation

Three dimensions of EO are considered in this work:

- **Innovation**: three variables to capture the orientation towards innovation were included in the questionnaire:

11. *Product innovation (prod\_inn)*: the business owners interviewed indicated whether their SMEs had introduced different types of product innovations in the last three years. The answers were coded as Likert variables with five alternatives with an ascendant

degree of innovativeness: 0 meant no innovations; 1 meant innovations in goods or services similar to others already in the market; 2 indicated innovations in goods or services with slight modifications with respect to the existing ones; 3 indicated innovations in goods or services with substantial changes with respect to the existing ones, and 4 represented innovations in goods or services that were entirely new in the market.

12. *Process innovation (proc\_inn)*: this variable captures innovation in the firm's internal processes in different areas (production, marketing, logistics, management, etc.) in the last three years. This variable was coded as follows: 0 indicated no innovations; 1 represented small incremental innovations coming from experience; and 2 meant radical process innovations introduced by the company.

13. *Technology acquisition (tech\_acq)*: this variable indicates whether the SMEs have purchased new technology in the market. It takes values from 0 to 4: 0 means no purchase and 1, 2 and 3 indicates respectively sporadic, moderate and intense acquisition of technology.

- **Proactivity**: three variables are considered as indicators of proactivity.

14. *Planning (plan)*: this dichotomous variable takes value 1 if the firm annually carried out formal business planning activities and 0 in the negative case.

15. *Control (cont)*: this dichotomous variable takes value 1 if the firm habitually carried out activities for monitoring and forecasting the firm's performance and 0 in the negative case.

16. *Alertness to business opportunity (opor)*: this dichotomous variable takes value 1 if the firm habitually searched for new economic opportunities in the market and 0 in the negative case.

- **Cooperation**: Six variables regarding cooperation activities are included in our analysis.

17. *Cooperation (coop)*: this variable reflects the existence of collaboration agreements between firms. It takes value 0 in the case of absence of any type of cooperation with other firms, 1 if informal cooperation existed, and 2 in the case of the existence of formal cooperation agreements.

18. *Research and Development cooperation (r&d\_coo)*: This dichotomous variable takes value 1 if the firm carried out any cooperation activity with other firms in the field of research and development and 0 in the negative case.

19. *Production cooperation (prod\_coo)*: This dichotomous variable takes value 1 if the firm carried out any cooperation activity with other firms regarding the organization of production and 0 in the negative case.

20. *Distribution and Sales cooperation (sal\_coo)*: This dichotomous variable takes value 1 if the firm carried out any cooperation activity with other firms regarding the distribution and sales of its products and 0 in the negative case.

21. *Marketing and publicity cooperation (mar\_coo)*: This dichotomous variable takes value 1 if the firm carried out any cooperation activity with other firms regarding marketing or publicity issues and 0 in the negative case.

22. *Purchasing cooperation (pur\_coo)*: This dichotomous variable takes value 1 if the firm carried out any cooperation activity with other firms regarding the purchasing of inputs to be used in its production process and 0 in the negative case.

#### **d. Dependency**

23. *Functional dependency (FDI)*: to measure the firms' functional dependence an index is proposed in this paper built upon the business owners' answers to a set of questions about the approximate percentages of sales and purchases that the companies made in local markets, in the rest of the province, in the rest of the region, the rest of Spain, and abroad (see also Figure 2). The functional dependency index is constructed from two indexes of extraversion -one for the sales and another one for the purchases. These indexes were defined after Romero (forthcoming), as follows:

1. The mid point of each interval indicated before was established as a class mark ( $m_i$ ).
2. A weight for each geographic market,  $w_i$ , was introduced as follows: 0 for the provincial market, 0.2 for the rest of the regional market, 0.5 for the rest of the national market, and 1 for the rest of the world.
3. The two synthetic indexes were defined to capture the extraversion of the sales ( $SE$ ) and the purchases ( $PE$ ), as follows:

$$SE(PE) = \frac{\sum_i w_i \cdot m_i^{s(p)}}{\sum_i m_i^{s(p)}} \quad (1)$$

The indexes of SE and PE were calculated as weighted averages of each market for each firm. In fact, the numerator in (1) could itself represent an index of extraversion. Nevertheless, the denominator  $\sum_i m_i^{s(p)}$  in expression (1) was introduced to make a pertinent correction because of the use of class marks instead of real percentages. If  $m_i^{s(p)}$  denoted the exact percentages of the sales and purchases in each market, it would

hold that  $\sum_i m_i^{s(p)} = 1$ . However, because  $m_i^{s(p)}$  represent class marks that is not necessarily true. That could imply a slight overestimation or underestimation of the extraversion indexes which can be faced by means of introducing the denominator in expression (1). The resulting indexes of SE and PE take values from 0 to 1, indicating the level of extraversion of the SME regarding its sales or its purchases, respectively (higher values of the indexes reflect higher levels of extraversion).

**Figure 2. Construction of the purchase and sales extraversion indexes**

*Question: What approximate percentage of the total sales (purchases) is made in the provincial market, the rest of the regional market, the rest of the national market and the rest of the world?*

		0	0.05	0.175	0.375	0.75	1	Class marks (m <sub>i</sub> )
		None	Up to 10%	10-25%	25-50%	More than 50%	100%	Intervals
0	Provincial market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0.2	Rest of the regional market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0.5	Rest of the national market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1	Rest of the world	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Market weights (w <sub>i</sub> )	Spatial markets							

Source: Romero (forthcoming).

Finally, the *Functional Dependence* index (FDI) is given by the following expression:

$$FD = PE - SE \tag{2}$$

The FDI index takes values between -1 and 1. The extreme value of -1 would be obtained for a firm which purchased all its intermediary inputs from local producers and sold all its output in export markets. On the contrary, value 1 would be obtained for a firm which imported all its inputs and sold its entire production in the local market.

*24. Backward and forward productive dependence:* Productive dependence from the firm's suppliers and clients has also been calculated using two indexes. In the questionnaire used for our survey, there were four questions asking about the approximate percentage of purchases/sales that the firm made from/to its main supplier/client, two main suppliers/clients, five main suppliers/clients or ten main suppliers/clients. The business owners interviewed had to choose between the following



six possible answers: less than 10%, between 10% and 25%, between 25% and 50%, between 50% and 75%, between 75% and 99%, and 100%. The mid point of each interval indicated before was established as a class mark ( $p$  for the input purchases and  $s$  for the output sales), except for the category “less than 10%” with 0 as a class mark and the category “100%” represented by  $I^2$ . Next, we summarized all this information using the following indexes of productive dependence:

$$BPD = \frac{1}{4} \sum_i p_i \quad (3)$$

$$FPD = \frac{1}{4} \sum_i s_i \quad (4)$$

where  $p_i$  represents the class mark regarding the input purchases absorbed respectively by its main supplier, its two main suppliers, the five main suppliers and the ten main suppliers ( $i = 1 \dots 4$ ); and  $s_i$  represents the class mark for the previous intervals of percentages regarding sales to, respectively, the main client, the two main clients, the five main clients or ten main clients ( $i = 1 \dots 4$ ). These indexes take values from 0 to 1. Higher values indicate a higher concentration of the firm’s sales or purchases among a small number of clients or suppliers. The backward/forward productive dependence (BPD/FPD) will take values between 0 and 1: 0 for those SMEs which concentrate less than 10% of their purchases/sales among their ten main suppliers/clients and 1 for the SMEs which concentrate 100% of their purchases/sales among their ten main suppliers/clients.

In the theory section, the general hypothesis of the existence of differences in the EQ of the SME sectors in economies with different levels of development was proposed. This general hypothesis was made specific in three different hypotheses. In order to test these hypotheses, the SMEs in our sample were classified in two groups by means of their location (*loc*) in comparatively-advanced provincial economies or in backward ones. Next, logistic regressions were estimated to test the influences of the independent and control variables on the dichotomous variable for firm location.

### 3.2. Results

Four logistic regressions have been estimated, as shown in Table 4. Model 1 includes only the control variables. In Model 2 the variables for motivation and work experience are incorporated. Model 3 adds the variables for the three dimensions of EO –

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<sup>2</sup> This is done in order to assure that the indexes take values between 0 and 1, as can be shown next.

innovation, cooperation and proactivity. Finally, Model 4 gathers all the variables including also the three dependence indexes. No problems of multicollinearity were detected.

**Table 4. Logistic regressions**

	MODEL 1				MODEL 2				MODEL 3				MODEL 4			
	B	E.T.	Sig.	Exp(B)	B	E.T.	Sig.	Exp(B)	B	E.T.	Sig.	Exp(B)	B	E.T.	Sig.	Exp(B)
<b>CONTROL VARIABLES</b>																
Size	-.017	.004	***	.983	-.016	.004	***	.984	-.018	.005	***	.982	-.014	.005	***	.986
Age	-.023	.006	***	.978	-.025	.007	***	.975	-.027	.007	***	.974	-.027	.008	***	.974
High_tech	-.093	.286		.911	-.127	.295		.880	-.181	.317		.834	-.111	.324		.895
Low_tech	.300	.212		1.350	.362	.218	*	1.436	.615	.235	**	1.849	.596	.253	**	1.816
Constr	.321	.285		1.379	.312	.290		1.283	.459	.307		1.582	.548	.324	*	1.730
Adv_serv	-.643	.316	*	.526	-.594	.326	*	.552	-.510	.342		.600	-.356	.367		.700
<b>ENTREPRENEURS' PERSONAL CHARACTERISTICS</b>																
Aut_mot					-.163	.084	*	.849	-.184	.090	**	.832	-.200	.097	**	.819
Cont_mot					-.155	.087	*	.856	-.230	.094	**	.792	-.229	.100	**	.795
Nec_mot					.234	.085	***	1.264	.235	.090	***	1.264	.187	.097	**	1.206
Exper					-.888	.197	***	.412	-.896	.209	***	.408	-.875	.222	***	.417
<b>ENTREPRENEURIAL ORIENTATION</b>																
<b>Innovation</b>																
Prod_inn									-.563	.200	***	.569	-.460	.213	**	.631
Proc_inn									-.552	.166	***	.576	-.533	.179	***	.587
Tech_acq									.333	.095	***	1.396	.263	.101	**	1.300
<b>Proactivity</b>																
Plan									.084	.197		1.088	-.039	.215		.962
Cont									.207	.245		1.230	.289	.268		1.335
Opor									-.311	.202		.733	-.303	.219		1.354
<b>Cooperation</b>																
Coop									.042	.157		1.043	-.002	.165		.996
R&D_coo									-.574	.347		.563	-.566	.367		.572
Prod_coo									-.431	.274		.650	-.498	.291	*	.608
Sal_coo									.689	.268	**	1.992	.600	.283	***	1.762
Mar_coo									.976	.391	**	2.653	1.172	.411	***	3.336
Pur_coo									.367	.327		1.443	.451	.344		1.570
<b>FIRM DEPENDENCE</b>																
FDI													1.537	.338	***	4.651
FPD													.167	.469		1.182
BPD													2.658	.429	***	14.265
Constant	1.346	.220	.000	3.842	1.370	.223	.000	3.936	1.062	.379	.005	2.892	.342	.415	.410	1.407

\*\*\* significant at p< 0.01; \*\* significant at p< 0.05; \* significant at p< 0.1

Global results are relatively satisfactory, as can be seen in Table 5. The omnibus test is always significant ( $p < 0.05$ ), denoting the acceptance of the hypothesis that  $\beta$  coefficients are different from zero. The variables considered in the analysis explain a fraction of the variance (Nagelkerke pseudo R-squared statistic) of 0.387 and the percentage of correctly-classified cases in the final Model 4 is 75.3 %. Model 1 is a baseline model which includes only basic characteristics of the SMEs such as their age, size and sector. As may be seen in Table 4, age and size significantly contribute to explain the dependent variable, with the expected signs. Thus, SMEs in advanced economies are characterized by a smaller size and are younger. These results are notably robust, since they are maintained when additional variables are included in Models 2 to 4. Regarding the sector of activity, in this Model 1 the only statistically-significant variable is the one for advanced services. In this respect, it is less probable for SMEs operating in advanced services to be located in the comparatively-backward provinces. However, in Models 3 and 4, once the rest of variables are included, there are two significant dummies for the sectors: the low-technology industries and the construction sector. In both cases, the sign is positive, which indicated a higher probability of finding SMEs in low-technological industries and construction in the backward provincial economies. Both facts tell us about an adverse specialization of the comparatively backward economies.

**Table 5. Goodness-of-fit statistics**

	MODEL 1	MODEL 2	MODEL 3	MODEL 4
Omnibus test: Chi-squared (significance level)	51.097***	85.706 ***	149.095***	225.915***
-2 log-likelihood	862.444	827.835	764.446	687.626
Cox and Snell pseudo R-squared	.074	.122	.202	.289
Nagelkerke pseudo R-squared	.099	0.162	.270	0.387
Percentage correct (1)	59.9	64.8	71.1	75.3

(1) A cut-off value of .0532 is used.

The three types of motivations considered in the model have significant coefficients. Entrepreneurs with an autonomy and continuity motivation have a lower probability of being found in the backward economies, whereas this probability increased for those entrepreneurs with a necessity motivation. In particular, the effect of the necessity motivation is the strongest among all the types of motivations included (as shown by the odds ratios). Moreover, the variable “experience” has negative and significant coefficient, showing that those inexperienced business owners are more probably located in the backward provinces.

Next, let us consider the results for the EO dimensions: innovation, cooperation and proactivity. Firstly, those SMEs which developed product or process innovations are

more likely to be located in the more advanced provinces, as the negative signs of the correspondent  $\beta$  coefficients in the regressions indicate. However, the SMEs which had purchased technology are located with a higher probability in the backward provinces. None of the variables for proactivity is significant. With respect to cooperation, those SMEs which cooperate with other firms in the purchasing of their inputs are more likely to be located in the advanced economies. However, those SMEs which have carried out cooperation activities in distribution and marketing have a higher probability of being located in backward areas.

Moreover, the indexes for functional and backward productive dependence are highly statistically significant in Model 4. The two coefficients are positive, showing that those SMEs which are productively dependent on their suppliers or functionally dependent are more probably located in the backward provinces. The odd ratios for these variables are relatively high, especially for the BPD. On the other hand, forward productive dependence has the expected sign, but this is not significant.

#### **4. Conclusions**

In this paper we have defended the hypothesis that differences exist in the EQ of the SME sectors in backward and advanced economies. The analysis of these differences is highly relevant in order to design effective enterprise policies aiming at fostering economic growth and job creation through the promotion of entrepreneurship and SMEs. We have explored these dissimilarities from a dataset with SMEs in four Spanish provinces. In this respect, as could be expected, the SME sectors in the backward provinces are characterized by a higher presence of SMEs in low-technological industries and SMEs with a lower size in terms of number of employees. Furthermore, the average age of SMEs in backward provinces is also significantly lower, showing a reduced rate of business survival.

Business owners' motivations in backward provinces have also certain peculiarities with respect to those in more advanced provinces. According to our results, in backward economies, there is a higher presence of necessity-motivated entrepreneurs and a lower presence of autonomy and opportunity-motivated ones in comparison with those in comparatively-advanced economies. This is in line with previous research from an international perspective within the GEM project. In addition, business owners in backward economies are motivated less frequently by the continuation of the family business, indicating a lack of entrepreneurial culture or tradition which has intergenerational consequences.

These differences in motivations could partially be behind the differences in the entrepreneurial orientation of the SMEs in backward and advanced economies. Thus, SMEs in backward provinces introduced less product and process innovations. However, they are more active regarding the acquisition of external technology. So, though they frequently do not have enough resources and capacity to generate their own innovations, they make a significant effort in order to catch up and get closer to the technology frontier. Furthermore, though in general terms SMEs in the backward and advanced provinces have no statistically-significant differences regarding the intensity of cooperation relationships with other firms, the more frequent types of cooperation in backward and advanced areas seem to differ. Thus, SMEs in backward economies cooperate less in input purchasing, but they are more frequently involved in marketing and publicity cooperation and, especially, in distribution and sales cooperation.

These results for cooperation might be also indicating different patterns of integration in the value chains of SMEs in backward and advanced areas. In advanced areas, SMEs, especially the larger ones, might establish stable relationships with specialized suppliers, as a result of outsourcing decisions regarding non-core inputs or functions. However, in backward regions the cooperation relationships have a particular focus on distribution, marketing and sales, since the SMEs in these economies simply assume in many cases the distribution and marketing of goods and services produced by large external companies. This type of insertion in the value chains only allows a residual component of the total added value to be caught by SMEs in backward economies, whereas most of the added value is captured by the large companies involved in production functions. The nature of these inter-firm linkages also leads up to a situation of dependence of SMEs on large external companies. In this paper, these dependence situations have been studied using the concepts of functional and productive dependence introduced by Guzmán-Cuevas et al. (2009) and specific indexes have been proposed to measure these dimensions of firm dependence. Two of these indexes are highly statistically significant in the logistic regression, indicating that SMEs in backward provinces are more functionally dependent on other areas and more productively dependent with regard to specific suppliers.

In consequence, enterprise policies aiming at fostering SMEs as an engine of growth should not approach entrepreneurship exclusively from a quantitative perspective, but take into account its qualitative dimension, trying to improve the entrepreneurial quality of the SME sector. In this way, it is convenient to promote entrepreneurship and support SMEs specifically in knowledge-intensive activities and sectors, avoiding patterns of

specializations leading to an impoverishing growth. It is also necessary to focus on those entrepreneurs with a strong intrinsic motivation and support those SMEs with a sound entrepreneurial orientation, stimulating innovation and proactivity. Finally, the position of SMEs in value chains highly influences the potential of the SME sector for driving regional development. In this respect, industrial policy has a significant role in order to boost up-grading processes of SMEs and improve the patterns of SME insertion in the value chains.

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#### Appendix. Sector classification

<b>High and medium-high technological industries</b>
Mining and quarrying (ISIC C.10-C.14)
Manufacture of food products and beverages (ISIC D.15)
Manufacture of tobacco products (ISIC D.16.)
Manufacture of textiles (ISIC D.17)
Manufacture of wearing apparel; dressing and dyeing of fur (ISIC D.18)
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear (ISIC D.19)
Manufacture of wood and of products of wood and cork. except furniture; manufacture of articles of straw and plaiting materials (ISIC D.20)
Manufacture of paper and paper products (D.21)
Manufacture of basic metals and fabricated metal products (except machinery and equipment) (ISIC D. 27 and D28)
Manufacture of other non-metallic mineral products (ISIC D. 26)
Manufacture of furniture; manufacturing n.e.c. (ISIC D.36)
Recycling (ISIC D.37)
<b>Low and medium-low technological industries</b>
Publishing. printing and reproduction of recorded media (ISIC D.22)
Manufacture of coke. refined petroleum products and nuclear fuel (ISIC D.23)
Manufacture of chemicals and chemical products (ISIC D. 24)
Manufacture of rubber and plastics products (ISIC D. 25)
Manufacture of machinery and equipment n.e.c. (ISIC D. 29)
Manufacture of office. accounting and computing machinery (ISIC D.30)
Manufacture of electrical machinery and apparatus n.e.c. (ISIC D. 31)
Manufacture of radio. television and communication equipment and apparatus (ISIC D.32)
Manufacture of medical, precision and optical instruments, watches and clocks (ISIC. D33)
Manufacture of motor vehicles. trailers and semi-trailers (ISIC D. 34)
Manufacture of other transport equipment (ISIC D. 35)
<b>Advanced Business Services</b>
Computer and related activities (ISIC K.72)
Research and development (ISIC K. 73)
Other business activities (ISIC K.74)