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Globalized Markets and Startup Dynamics in Mature Manufacturing Industries

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Abstract In a globalized economy and becoming more knowledge-based, two apparently contradictory phenomena are shaping the organization and location of many mature economic activities: a general tendency of firms to agglomerate geographically while traditional clusters (and notably industrial districts) are facing a period of crisis in their identity, structure, and cohesion. Since the turn of the new century, regulatory changes, intensified global competition, rapid changes in technology and markets, and increasing complexity and uncertainty in the business environment, have created a more dynamic and globalized market conditions for the European firms of mature industrial sectors, like textile and clothing (T&C) industry. As a result of these changes and of the firms' responses, the future of this industry and of the regions where it is located has been put into question. The aim of this research is to determine the territorial dynamics of startups in the textile and clothing industry in Spain. For this research, we have adopted a historical perspective focused on analysis of the intersection of the geographical locations of startups in Spain (the industrial district effect) and the main types of activities performed by new-venture firms (the subsector effect). Our results have important implications for the theory and practice in the textile and clothing industry: the need to distinguish the location of a firm when both analyzing its performance and formulating and implementing public policies.

Keywords Globalization · Entrepreneurship and startup dynamics · Textile & clothing industry · Industrial clustering

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Introduction

In a globalized economy and becoming more knowledge-based, two apparently contradictory phenomena are shaping the organization and location of many mature economic activities. On the one hand, we observe a general tendency of firms to agglomerate geographically. On the other hand, traditional clusters, and notably industrial districts, are facing a period of crisis, not only in their current performance but—most importantly—in their identity, structure, and cohesion.

Since the turn of the new century, regulatory changes, intensified global competition, rapid changes in technology and markets, and increasing complexity and uncertainty in the business environment, have created a more dynamic and globalized market conditions for the firms of the European Union (EU) mature industrial sectors, like textile and clothing (T&C) industry. As a result of the above trends, the territories where firms are located have been significantly affected.

As a result of these political, economic, and technological trends, the EU T&C manufacturers have faced increased global competition at the local level. On the supply side, they have seen a growing number of market participants; on the demand side, they have faced the growing bargaining power of retail firms as many retailers (e.g., *Carrefour*, *Decathlon*, *Inditex*) have increased in size and buying power.

As a result of these changes and of the firms' responses, the future of T&C industry in the regions where it is located has been questioned. A stream of public opinion has emerged in support of new ventures activity. The central argument is that the creation of startups could help reverse the employment decline (Feldman et al. 2005; Glaeser and Kerr 2009).

However, it is a fact that few public policies have been implemented to date to stimulate the development of startups, and the extant policies have been implemented with little consideration of the particular territories and industries in which the startups should be developed (Zourek 2007; Obadic 2013).

In light of the issues discussed above, the purpose of the research is to determine the territorial dynamics of startups in the T&C industry in Spain, one of the three main EU countries in employment and production volume (DG Enterprise & Industry 2010). The main contribution was the adoption of a historical perspective focused on analysis of the intersection of the geographical locations of startups in Spain (industrial district effect) and the main types of activities performed by startup firms (subsector effect). Our results have important implications for the theory and practice in the T&C industry: knowing the key variables that influence the location of a new firm to analyze their performance both as to the formulation and implementation of public policies.

The remainder of this paper is structured in four sections. The next section provides the conceptual framework. The third section describes the research design and methodology. The fourth contains the results of the empirical analysis, along with the conclusions and academic and political economic implications of the findings.

Conceptual Background

European T&C manufacturers have undergone significant change since then due to several factors: rising oil prices, EU enlargement, and various free trade agreements

between the EU and other regions or countries (Shen 2008). Another influential factor is trade liberalization in T&C beginning in 1995 with the phasing out of the Multi-Fiber Arrangement (MFA) and a progressive decline in international shipping costs, technological advances in production systems, and the economic crisis of 2008–2009 in southern EU countries.

The factors identified above have led to a deep transformation of market conditions for T&C manufacturers in developed countries in recent years (Ha-Brookshire and Dyer 2008). The pre-1995 market environment was characterized by substantial domestic production, relatively light competition, consolidated manufacturing processes, high demand for clothing products, but relatively weak consumer power. The transformed market environment is characterized by still high but fickle demand for clothing products and global manufacturing processes through sourcing production in various low-income countries (Dyer and Ha-Brookhire 2008).

To deal with the above-mentioned new market conditions and increased global competition, many small and medium (SMEs) manufacturers in the T&C industry in developed countries have reconfigured their production strategies (Buxey 2005; Scott 2006) following three options:

(a) They have adopted new patterns of spatial location forming local production systems (LPS), or clusters: industrial spaces (geographical agglomerations) containing companies that perform interrelated activities (Puig and Marques 2010).
(b) They have increased imports of semi-finished and finished products from emerging economies in order to reduce costs in labor-intensive operations (Coucke and Sleuwaegen 2008).
(c) They have used a multi-location production strategy that embodies significant offshore outsourcing of production in low-income countries (Sammarra and Belussi 2006; Taplin 2006).

In addition, Scott (2006) identified three categories of manufacturers and T&C firms in terms of their territorial distribution:

1. Isolated firms, many of them vertically-integrated middle-sized and big companies.
2. Firms without significant productive relationships: without meaningful links to the activities of other firms in the territories in which they operate (hybrid industrial areas).
3. Firms that form local production systems: industrial spaces containing companies that perform interrelated activities (industrial districts/clusters).

The third category can significantly affect the territorial dynamics of startups including the future industrial structure concentration and spatial distribution of the activities of the startups (Drucker 2011).

Locations Where Startups in T&C are Created

According to business and historical literature, (Pickles and Smith 2011) T&C activity occurs in a limited number of locations. In addition, the locations that contain firms specialized in T&C industry often has a history of such specialization with the

manufacturers benefitting from their proximity to each other (Dei Ottai 2002). In the case of locations in Spain with high concentrations of this activity (e.g., the Mediterranean area), the productive relationships between the manufacturers have provided significant agglomeration economies that result from the concentration of production in a given territory, either for an individual company or for the industry in general.

According to Parr (2002), agglomeration economies have their origin in the local pooled labor force and specialized suppliers, and their effect on the lower prices at which companies can purchase their inputs, given the inferior transaction costs and the continuous interdependences that favor the accumulation of knowledge and learning.

These savings have significant long-term consequences in the unit cost curve of a company and therefore in the spatial structure of industries (Costa and Viladecans 1999; Molina-Morales et al. 2012). The agglomeration economies have attracted new entrants to the locations and stimulated new ventures, generating intense territorial entrepreneurial activity in related operations (Delgado et al. 2010; Pe'er and Keil 2013).

Although according to the literature it is possible to identify different types of geographic agglomeration of business activity (Rosenfeld 1997), in mature industrial sectors two main types stand out: the hybrid industrial areas which are very common in comparatively northern European locations (Germany and France) and the LPS model, widely extended in southern Europe (i.e., Italy, Portugal, and Spain) (Puig et al. 2012).

These two types could lead to different predictions about the development of agglomeration economies (Martin and Sunley 2011). Moreover, within the second model it is possible to identify a number of variants (Molina-Morales and Martínez-Martínez 2004). In general, the two most analyzed variants of the LPS model are clusters and industrial districts.

The difference between a cluster and an industrial district can be seen through socioeconomic lenses (Dei Ottai 2002). Broadly speaking, an industrial district can be defined as a group of firms that consists of many micro and small firms operating in a particular geographic area in the same productive activity or industry and exerting significant influence on the immediate community in which they operate. In others words, all industrial districts are clusters, but not all clusters are industrial districts (Hervás-Oliver and Albors-Garrigós 2008).

Agglomeration economies evidenced by the extant literature have shaped a whole line of research devoted to studying the so-called district effect that is the differences between companies of the same industry (e.g., T&C) depending on whether the condition (as a dichotomist variable) "belonging to an industrial district" is met or not. This stream of research has shown the positive location influence on the performance of companies (in terms of profitability, internationalization, and innovation) and how this influence can vary by the main production activities of the companies in a territory and by the extent to which the activities of the different companies in this area are interrelated (Molina-Morales and Martínez-Martínez 2004; Ruiz 2010).

Globalization is one of the factors that can exert pressure to change the territorial distribution of the manufacturers that traditionally formed an LPS (Buckley and Ghauri 2004; DeMartino et al. 2006). Due to globalization, industrial districts (clusters) may undergo significant change over time (Martin and Sunley 2011; Ha-Brookshire and Lee

2010): the districts appear and grow, change their features and their orientation, modify their internal patterns, may transform, or may languish and disappear.

Analysts taking a dynamic perspective have questioned whether clusters and industrial districts in mature industries still are influencing firms (De Propis and Lazzerretti 2009). Their line of thinking is that globalization, combined with a dense population of firms in an industrial district and cannibalization among the firms in the district, leads to loss of competitive advantages for the firms and ultimately the decline of the district.

Staber (2007), Menzel and Fornahl (2010), and Martin and Sunley (2011) argued that increased competition in an industrial district drives firms in the district to implement production strategies aimed at reducing operational and processing activities, causing negative external economies including the demise of complementary companies and intensified rivalry among competing firms in the same geographical area. Furthermore, authors such as Holmes et al. (2010) have evidenced some key requirements for startup performance, especially during the initial stages: availability of financial resources and favorable macroeconomic conditions. These aspects have been seriously harmed during the economic crisis, and as a result, entrepreneurial activity has been discouraged.

In short, because one of the basic determinants of entrepreneurship and the location of startups appears to be the entrepreneurial environment, we expect globalization to affect the territorial dynamics of new ventures in textile industry in Spain by reducing the favorability of a region for startups as the geographic concentration of the firms in this manufacturing sector and the density of these firms in the region increase. These ideas about globalization, economic crisis, and location, are summarized in the hypotheses below.

> Hypothesis 1a: The more recent the time period considered, the lower the creation of new ventures in the T&C industry.
> Hypothesis 1b: The greater the geographic agglomeration of the textile industry firm, the lower the creation of new ventures in this sector.

Typology of Startups Created in T&C Industry in Spain

Geographical agglomeration of firms, such as industrial districts, exemplify industrial systems with division of labor and decentralized production processes that run counter to large vertically integrated firms (e.g., Inditex) reducing the degree of industry concentration (Drucker 2011). Such a territory contains many firms, entrepreneurs, and workers that form a network-based socioeconomic system (Becattini 2004; Sammarra and Belussi 2006). In fact, the relationships established between the actors in the network generate a significant flow of information about entrepreneurial opportunities (Dei Ottai 2002; Delgado et al. 2010).

The managerial function of the firms in textile clusters is a key determinant of the types of new-venture companies created in such systems. On one hand, the size of the companies in these systems is small and they develop independent and often conservative attitudes (Giuli 1997). On the other hand, professional management skills, especially those needed in times of change and crisis, are relatively scarce (Pla-Barber et al. 2007). These features collectively lead to

rather homogeneous activities of the companies in such a system but to a degree of heterogeneity in the activities performed in different local production systems (Jones and Hayes 2004).

Diverse subsectors exist among the T&C sector in the main European producer countries (Eurostat 2009). The firms in the different subsectors face different competitive environments, with the products, customers, and supplier and competing firms being distinctly different from the firms in separate subsectors (Jódar et al. 1997). Some of the subsectors in T&C manufacturing are labor intensive, low tech and low value added (LVA). These subsectors coexist with largely new ones that are capital intensive, high tech, and high value added (HVA).

This heterogeneity among firms is central to understand their dissimilar performance and the new firms that will be created. Recent studies have shown that manufacturing startups are not affected equally by competition (Pe'er and Keil 2013), and empirical evidence has been found showing that financial performance of T&C manufacturers varies across firms. Firms in HVA subsectors perform better than those operating in LVA activities and have significant growth potential (Puig et al. 2009). Other investigations suggest that LVA subsectors are in decline in the EU-15 countries (Buxey 2005; Smith, Pickles, Begg, Roukova, and Bucek 2005; Taplin 2006).

Therefore, to understand the types of new-venture T&C firms that have been created in countries like Spain, one should consider not only globalization and the territorial distribution of these companies but also the subsectors in which the firms operate. Given the discussion above, we expect a progression over time into HVA activities in the new-venture T&C manufacturers, as summarized in the following hypothesis.

> Hypothesis 2: The more recent the time period considered, the greater the creation of new ventures in HVA subsectors in the T&C industry.

Research Design and Methodology

Sample

To address the research purpose, it was necessary to compare T&C firms located in LPS and industrial districts with companies not in such areas, isolated firms or firms in hybrid industrial areas. We selected the Spanish T&C industry for this study due to three main reasons:(1) the difficult situation that this industry is experiencing in that country and that is seriously threatening the industry's future, (2) the T&C industry's importance in terms of production and employment for the Spanish economy, and (3) the Spanish T&C industry's tendency to agglomerate geographically.

Our sample is drawn from the Iberian Balance sheet Analysis System (Sistema de Análisis de Balances Ibéricos [SABI]) database. The SABI database (supplied by INFORMA D&B and Bureau Van Dijk) has been used extensively in research (e.g. Puig et al. 2009; Molina-Morales et al. 2012). The SABI (2012) data we used cover the period 1920–2009.

Variables

The variables in this research are governed partly by the data available in the SABI database. The variables are the following:

Time Period Each Firm Began This variable indicates the time period when each firm in the sample was established. For the purposes of the analysis the total time period covered in the data was divided into sub-periods, reflecting different degrees of uncertainty and globalization in the environment for T&C manufacturers in Spain. The sub-periods were defined according to three levels of time period segmentation.

Segmentation Level 1 (1920–2009) At this level of segmentation, the total time period covered in the data was divided into two sub-periods of firm creation: firms created over 1920–1999 and those created over 2000–2009. These two sub-periods differ in the degree of stability and uncertainty for T&C manufacturers in Spain, with more instability and uncertainty over 2000–2009 than previously.

Segmentation Level 2 (2000–2009) At this level of segmentation, the period 1920–1999 was omitted, but the period 2000–2009 was subdivided as follows: firms created each year over 2000–2004 and those created each year over 2005–2009. The subdivision into individual creation years over 2000–2004 and over 2005–2009 was to allow a finely grained examination of creation year relative to other variables.

Geographic Agglomeration of Firms Assessment of the evolution of territories and regions requires the use of location quotient—LQ—(Cromley and Hanink 2012), which are indicators about the geographic density of firms and activity in each relevant territory.

Location Quotient (LQ) Following Cromley and Hanink (2012), the LQ with reference to T&C industry's employment at observation (or location) *i* is a ratio of ratios. In Eq. (1) the ratio for the local unit of observation (province) can be written as *ei/Ei*, where *ei* is employment in the given sector at province *i*, and *Ei* is total employment at province *i;* the ratio for the aggregate reference economy can be written as *e/E*, where *e* and *E* are, respectively, total employment in the T&C industry and overall employment in the reference economy (Spain). Then:

$$LQi = \left(ei \middle/ Ei\right) \middle/ \left(e \middle/ E\right) \tag{1}$$

The Population and Housing Census of the Spanish National Institute of Statistics (INE 2004) is the source of the employment data used to calculate the LQs. The most recent data available are for 2001. The LQ measure used in this study has also been used by Puig and Marques (2010) in research on the T&C industry in Spain. No commonly accepted thresholds exist to define what constitutes a high or low degree of geographic density of firms specialized in an activity in a territory (O'Donoghue and

Gleave 2004). For use in some of our data analysis, we defined the following categories of the LQ in a province:

Provinces with a low density, 1=[0<LQ<1]
Provinces with a medium level of density, 2=[1<LQ<2]
Provinces with a high density, 3=[LQ>2]. The high level of specialization would indicate the existence of an industrial district.

District Belonging (DB) This is a dummy variable that denotes whether or not a firm was in, or belonged to, an industrial district. We determined whether or not each firm in the sample was in an industrial district through information provided in the SABI database on the location of each firm, either within or outside a territory specialized in the subsector in which the firm operates. Thus, each firm was categorized as either

0 a firm outside an industrial district (FOD) or
1 a firm inside an industrial district (FID).

Subsector of Activity This is a dummy variable that indicates the type of subsector in which each firm in the sample operated (Puig et al. 2012). In this study, the subsectors are distinguished by whether they are low or high value added:

0 firm in a low value-added (LVA) subsector, epigraphs 17.1 and 17.2 (yarn), 17.3 (finished articles), 17.6 and 17.7 (knitted textiles), and 18.2 (clothing); or
1 firm in a high value-added (HVA) subsector epigraphs, 17.4 and 17.5 (home-technical).

Legal Form of Each Firm This variable, a proxy for firm size, serves as a control variable. The variable indicates the legal form of each firm in the sample in one of two categories: stock (publically owned) company (SC), a proxy for bigger companies, or limited company (LC), a proxy for smaller companies. Our preliminary sample included some firms with another legal form, cooperative companies; however, because only 252 of the firms had this legal form, the cooperative companies were removed. Since another important aspect of our study was the location of each company, those firms that had defective or insufficient information on their location were eliminated (267). After this depuration process, we obtained a final sample of 11,894 firms. It must be also noted that some companies might not have facilitated all information on other variables.

Table 1 summarizes the main characteristics of the sample. It is noteworthy that, for the total period considered and each level 1 sub-period we defined, most firms in the sample were located in provinces with a LQ=3: 4885 over 1920–1999, 1484 over 2000–2009, and 6369 firms over 1920–2009. Besides, most companies did not belong to industrial districts: FOD=8146 over 1920–1999, 2867 over 2000–2009, and 11,013 over 1920–2009. In addition, most of the firms were in LVA subsectors over 1920–2009 (9602 firms), and most had the limited company (LC) legal form over 1920–2009 (9939 firms).

Table 1 Sample features

	Firms created (1920–1999)	Firms created (2000–2009)	TOTAL (1920–2009)
Location Quotient (LQ)			
Low	2578	1086	3664
Medium	1398	463	1861
High	4885	1484	6369
District belonging (DB)			
FOD	8146	2867	11,013
FID	715	166	881
Subsector			
LVA	7339	2263	9602
HVA	1522	770	2292
Legal Form			
SC	1891	64	1955
LC	6984	2955	9939

Statistical Analysis

We tested the hypotheses by conducting two types of analysis in which we contrasted groups of firms in the sample by time period. First, we conducted an exploratory analysis using contingency tables to assess the associations between sub-periods and other variables. In this analysis, the strength of each bivariate relationship was measured with adjusted residuals. Second, with the aim of conducting a confirmatory analysis contrasting the simultaneous effect of the variables on entrepreneurship dynamics, a multivariate technique has been used. Specifically, logistic regression has been the multivariate statistic tool chosen. This type of regression aims at explaining the probability that each original individual belongs to a group, as a function of its profile variables, and at the same time quantifying the weight of each of them in the discrimination (Hair et al. 2000).

Data have been treated through graphics options of Excel spreadsheet and also through SPSS-15.0 statistical analysis package.

Results: Analysis and Discussion

Before conducting the data analysis, we used the graph in Fig. 1 to examine the pattern of new-venture creation in T&C manufacturing in Spain over 2000–2009. With a near-perfect regression line (R^2=0.983), the graph shows a year-to-year decline in the number of new ventures created over 2000–2009. The new-venture creation fell precipitously from 532 in 2000, to 201 in 2007, and to 60 in 2009. This decline coincides with events that occurred over 2000–2009: the successive removal of trade restrictions imposed under the MFA, culminating in full elimination of the restrictions in 2005, and the economic crisis of 2008–2009.

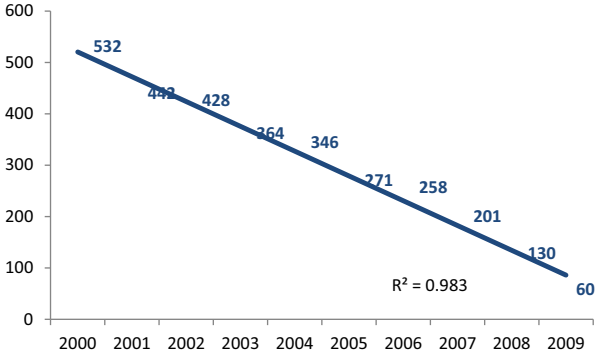

Fig. 1 Evolution of clothing industry startups in Spain (2000–2009)

The decline in startups shown in Fig. 1 supports hypothesis 1a and suggests difficulties of T&C firms in Spain in regenerating or reshaping this manufacturing sector in the face of the new market conditions brought about by trade liberalization and the economic crisis; however, analysis is needed to clarify the effects of these market-changing factors on not only the number of new ventures created but also the nature of the new ventures.

Thus, we used contingency tables to contrast the associations between the different degrees of geographic density of the new-venture firms and the time periods of firm creation, as well as those between the new-venture firms being in LVA vs. HVA subsectors and the time periods of firm creation.

For levels 1 and 2 of time period segmentation of new-venture creation, the results are shown in Table 2. The first cell in Table 2 shows the associations between the different degrees of provincial density and sub-periods, 1920–1999 and 2000–2009.

Table 2 Associations between sample features and sub-periods

	Level 1 sub-periods		Level 2 sub-periods	
	1920-99	2000-09	2000-04	2005-09
Location quotient (LQ)				
Low	(−6.9)**	+6.9**	(−1.4)*	+1.4*
Medium	+0.7	(−0.7)	+0.2	(−0.2)
High	+5.9**	(−5.9)**	+1.2*	(−1.2)*
District belonging (DB)				
FOD	(−4.7)**	+4.7**	(−1.1)*	+1.1*
FID	+4.7**	(−4.7)**	+1.1*	(−1.1)*
Subsector of activity				
LVA	+9.9**	(−9.9)**	+0.9	(−0.9)
HVA	(−9.9)**	+9.9**	(−0.9)	+0.9

FOD firm outside an industrial district, *FID* firm inside an industrial district, *LVA* low value added, *HVA* high value added

*p<0.1, **p<0.05

This cell shows a significant association between a low LQ level and each of these sub-periods, but negative (−6.9) for 1920–1999 and positive (+6.9) for 2000–2009. Because the adjusted residual exceeds the critical value (±1.96), the difference is significant at the 95 % level. Thus, fewer new-venture textiles created in Spain over 1920–1999 were in provinces with low LQ than might be expected, but more of them created over 2000–2009 were in provinces with high LQ than might be expected.

Turning to the results in cell one for a medium LQ level, they show no significant associations with time periods of firm creation, although the signs are as hypothesized. However, the results for a high LQ level show a significant positive association (+5.9) with the 1920–1999 period, with more firms created in provinces with high specialization than might be expected, but a significant negative association (−5.9) with the 2000–2009 period, with fewer firms created in provinces with high specialization than might be expected. Results in cell one for the district-belonging variable (DB) nearly replicate those for the low vs. high LQ levels. They indicate that the more recent the time period considered, the fewer the new-venture firms that were in industrial districts. These results support Hypothesis 1b.

Thus, the results described above show a reduction over time in the rate of new-venture creation in LPS within the T&C industry. This may suggest that competitive advantages for firms in this manufacturing sector from being in industrial districts or clusters were dissolving at least in part as a result of globalization, trade liberalization, and to some extent the economic crisis. Our findings align with those of De Propis and Lazzerretti (2009) and Menzel and Fornahl (2010). Moreover, given the concentration of numerous small firms and jobs in industrial districts, the changes just described may indicate a threat to the traditional organization of production and suggest a reshaping of such districts.

A question then arises as to what types of companies according to their main or core activities were created. Answering this question requires assessment of how new ventures responded to the new market conditions. Specifically, did startups engage in the same activities as existing firms in the industry or opt for innovative activities? This distinction is expressed in our subsector variable in which each firm in the sample was categorized in either a low value-added (LVA) or high value-added (HVA) subsector. Table 2 shows the association between each of these categories and each of some of the defined sub-periods.

As shown in Table 2, the association between new-venture firms in LVA subsectors and the period 1920–1999 is positive (+9.9) and significant at the 95 % level. This suggests that during this period more new-venture firms in LVA subsectors were created than expected. Table 2 also shows that the most dynamic subsector to create new ventures in recent years is the HVA one. Both associations are positive (+9.9 and + 0.9). Although for the most recent range adjusted residuals are not significant (+0.9), the results are consistent with expectations. This reasoning leads to the acceptance of hypothesis 2.

Thus, it can be stated that startup T&C manufacturers in subsectors characterized as low tech and intensively using low-skill labor were created at a high rate during the period before trade liberalization in T&C; however, startup creation in these subsectors declined during and after the trade liberalization. These findings are consistent with those more general for manufacturers (Pe'er and Keil 2013) and also with those specific for T&C (Puig et al. 2009; Molina-Morales et al. 2012).

Finally, we used logistic regression to simultaneously assess the effects of three features of new-venture T&C manufacturers on the probability of these firms belonging to industrial districts. We used this statistical technique in order to predict the characteristics of a new T&C company as a function of the independent variables (location or LQ, activity or subsector, and size or LF).

The dependent variable in the logistic regression takes two categories: (1) P=the probability of belonging to industrial districts; or (2) $1-P$=the probability of not belonging to such districts.

The logistic regression model is describe by Eq. (2)

$$log(P, 1-P) = \alpha + \beta 1LQi + \beta 2SSi + \beta 3LFi + \varepsilon \quad (2)$$

where i represents each firm in the sample, LQ is the degree of specialization of the province where each i new-venture firm was located (measured as a metric variable that only takes positive values); SS is the subsector in which each new-venture firm operated (1 if firm i is HVA, 0 otherwise); LF is the legal form of each new-venture firm (1 if firm i is limited 0 otherwise); α is a constant term and ε is the error term.

The results of the two separate estimations of the logistic regression model are shown in Table 3. This table includes for each independent variable the estimated coefficient (βi), the standard error (SE), and the corresponding exponentiated coefficient [exp (βi)], which is needed to interpret the magnitude of the relationship between an independent variable and the dependent variable in logistic regression. The table also indicates whether each βi coefficient is significant at $p<0.05$ (**).

As seen in Table 3, the β coefficient on LQ in Model 1 (0=1920–1999; 1=2000–2009) and in Model 2 (0=2000–2004; 1=2005–2009) is negative and significant ($\beta=-0.51$ and $\beta=-0.13$). These results indicate that the probability of startups belonging to industrial districts declined with increased agglomeration of the provinces in Spain where these firms were located, although more so for firms created during 2000–2009 than during 1920–1999 and for firms created during 2005–2009 than during 2000–2004.

Turning to examination of the exponential coefficients on the LQ variable, it should be noted that one subtracts 1 from the value of such a coefficient on a continuous, or

Table 3 Results of the logistic regression

	Model 1 (0=1920–1999; 1=2000–2009)			Model 2 (0=2000–2004; 1=2005–2009)		
Variables	β	S.E.	exp (β)	β	S.E.	exp (β)
LQ (metric)	−0.51**	0.01	0.60			
Subsector of activity	0.14**	0.05	1.15			
Legal form	−0.50	0.03	0.08			
LQ (metric)				−0.13**	0.04	0.86
Subsector of activity				0.22	0.09	0.80
Legal form				−0.58**	0.07	0.55

LQ location quotient, *SE* standard error

*p<0.1, **p<0.05

metric, independent variable in order to determine the percentage change in the dependent variable per unit change in the independent variable. Thus, the exp (β) of 0.60 for the LQ variable in Model 1 indicates that the probability of new-venture firms belonging to industrial districts declined 40 % more per unit increase in the degree of specialization of the provinces where such firms were located for the firms created during 2000–2009 than during 1920–1999. Similarly, the exp (β) of 0.86 for the PS variable in Model 2 indicates that the probability of new-venture firms belonging to industrial districts declined 14 % more per unit increase in the degree of specialization of the provinces where such firms were located for the firms created during 2005–2009 than during 2000–2004.

For the subsector of activity variable, Table 3 shows a positive and significant β coefficient in Model 1 ($\beta = 0.14$), indicating that the probability of new-venture firms belonging to industrial districts was higher for HVA than LVA firms but more so for firms created during 2000–2009 than during 1920–1999. These results support hypothesis 2. Although the β coefficient on this variable in Model 2 is not significant ($\beta = 0.22$), its sign is as hypothesized. Regarding the exponentiated coefficient on the subsector of activity in Model 1, its value indicates that the probability of new-venture firms belonging to industrial districts was 15 % higher for such firms in HVA subsectors than for those in LVA subsectors, although more so for new-venture firms created during 2000–2009 than during 1920–1999.

Finally, the β coefficient on the legal form (LF) variable is negative and significant in Model 2, but is not significant in Model 1. The β coefficient on LF in Model 2 indicates that the probability of new-venture firms belonging to industrial districts was lower for limited firms than stock firms. The exp (β) of 0.55 for the LF variable in Model 2 indicates that the probability of new-venture firms belonging to industrial districts was 45 % lower for limited firms than stock firms, but more so for firms created during 2005–2009 than during 2000–2004. These results show the importance of considering the legal ownership structure of new-venture T&C manufacturers in Spain in the context of industrial agglomeration. The results for Model 2 can be compared to the sample characteristics in Table 1 regarding legal form. That table shows that limited firms greatly outnumbered stock firms among the new-venture T&C manufacturers created in Spain over 2005–2009. Limited firms tend to be smaller, simpler, and have more personal administrative styles than stock firms, and the results in Table 3 suggest that limited firms were less likely than stock firms to belong to industrial districts in recent years, specifically 2005–2009, that is post the trade liberalization in T&C.

Conclusions

This longitudinal study of the territorial dynamics of startups in the T&C industry in Spain shows important changes during the analysis period, 1920–2009, in the number of these new ventures created, in the degree of specialization in this manufacturing sector in the provinces where the new ventures were located, and in the subsectors (low- vs. high value-added activities) of the new ventures.

Three main conclusions arise from the study. First, the number of T&C startups in Spain declined overall and year to year over 2000–2009. Second, the areas in Spain

where new-venture T&C manufacturers were located were much less agglomerated (lower LQ), which may imply that new-venture T&C manufacturers in Spain are more dispersed geographically than formerly. And finally, these firms have increasingly engaged in high value-added production activities, which tend to be more design- and technology-intensive and more profitable than the low value-added production activities that were prevalent in the past in such firms.

In this research, we inferred, from the results of analyzing relationships between sub-periods over 1920–2009 and major features of T&C startups in Spain (one of the most important countries in the EU in terms of employees and production in that industry), the influences of globalization, the economic crisis of 2008–2009, and relocation strategies of firms on the spatial organization of LPS.

Our analysis of major features for the period 1920–2009 provides evidence of a new territorial distribution of T&C in Spain toward a more hybrid nature with less agglomeration in industrial districts than formerly (toward clusters). The results also provide evidence that new-venture firms in this manufacturing sector in Spain have reduced in size and have increasingly engaged in high value-added production activities. These findings agree with those of Buxey (2005) and Pickles and Smith (2011).

Our research provides two main contributions. On the one hand, one of a theoretical nature is suggesting that agglomeration of manufacturers in industrial districts traditionally offered advantages stemming from specialization in particular production activities and close relationships between firms and workers within the districts, but may deter the competitiveness of constituent firms facing globalized markets free of quantitative trade restrictions. Firms engaged in low value-added production activities in developed countries directly compete with, and have an inherent competitive disadvantage against, such firms in low-income countries.

On the other hand, a normative contribution of our study is that it suggests that intense specialization in particular types of manufacturing in a region of a country can work against efforts to promote economic development in the region or the region's social and economic recovery after an economic crisis.

The ideas discussed in the paragraph just above imply that firm managers and government policymakers in a developed country like Spain may need to alter their approach to the development of firms and regions within the country. In line with Zourek (2007), Smith et al. (2005), and Obadic (2013), our findings suggest that territorial reorganization away from industrial districts to clusters and the pursuit of high value-added activities, supported by public policies that favor these, offer viable ways to improve the performance of T&C manufacturers in Spain in the globalized market environment these firms currently face.

Our research is subject to limitations. These include the types of the available data, the time period of the data, and the particular definitions in the SABI database for the territories in Spain where new-venture T&C manufacturers were located during the analysis period and for the types of activities of these manufacturers. In addition, our research relates to only T&C manufacturers in Spain. It is not clear whether the findings can be generalized to such manufacturers in other developed countries or to other manufacturing industries.

However, evidence provided by Puig et al. (2012) indicates that similar results might be found for some other European countries. An interesting extension of our study would be testing whether results similar to ours would be found for other mature

industrial sectors (e.g., the footwear industry) and in other countries such as the USA. Another interesting research direction would be the analysis of additional demographic characteristics (e.g., net firm creation or dissolution).

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