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Creative Industries: a Preliminary Insight to their Location Determinants

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Creative Industries: a Preliminary Insight to their Location Determinants*

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Abstract:

This paper is about location decisions of Creative Industries and the role played by existent spatial distribution and agglomeration economies of these kinds of activities in order to analyse their location determinants. Our main statistical source is the REIC (Catalan Manufacturing Establishments Register), which has plant-level microdata on location of new plants. Using Count Data Models, our main results show that location determinants are quite similar between both industries and also both non-creative and creative firms are positively influenced by the specialisation level in Creative Industries of municipalities. Moreover, our results provide evidence that the unobserved '*creative milieu'* has a limited impact on attracting firms.

Keywords: creative industries, creative milieu, count data models, industrial location, agglomeration economies

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1. Introduction

The study of location determinants of manufacturing firms has increasingly caught the interest of researchers in recent years, leading to a noticeable boost in publications in this area (see Arauzo-Carod et al., 2010, for a review of the empirical literature). However, although location issues as a whole are a growing topic, scholars have paid little attention to some industry-specific analysis such as Creative Industries.[1]

In light of this global interest, there is room for analysing location specificities for these industries, especially after the emergence of several theoretical and empirical studies underlining the importance of CI's as factors for local economic growth and development (see Power and Scott, 2004 and UNCTAD, 2008-2013, among others). Also these industries are believed to enhance the image and prestige of areas hosting them, making easier to attract new investors and creative workers (Florida, 2002a). Moreover, the entry of creative firms should lead the diversification and competitiveness of local economies (De Propris, 2013; Scott, 2004). For these reasons many scholars have attempted to link creative environments with economic growth but, unfortunately, few of them have been able to capture the effect of this vague atmosphere. Firstly, most studies have analysed agglomeration patterns of CI's, but few of them have considered how the concentration of creative workers can benefit to a specific area in terms of attracting new firms. Secondly, nothing has been said in the literature about whether the location determinants of creative firms differ from those of other manufacturing firms. And thirdly, there are still some difficulties in defining and measuring this unobservable *'creative milieu'*. All these shortcomings hamper the setting-up of clear policies to promote CI's. In this paper, we aim to shed light on this relationship and provide empirical evidence for the effects that creative environments have on location decisions of firms. Specifically, this paper addresses three research questions: 1) Are the determinants of location decision for creative and non-creative firms substantially different? 2) Is the specialisation in creative sectors a driving force for the location of firms in a municipality? 3) Does the same unobservable '*creative milieu*' that favours the agglomeration of bohemians increase the entry of firms?

[1] We will refer to Creative Industries as CI's.

Empirical application will focus on Catalan municipalities using data from REIC (Catalan Manufacturing Establishments Register), which has plant-level microdata on location of new manufacturing plants for the period 2002-2007. Indeed, we use a dataset about local characteristics of Catalan municipalities taken from Trullén and Boix (2005), and we also rely on other sources as the Catalan Statistical Institute (IDESCAT, 2001) and the Catalan Cartographical Institute.

Using Count Data Models, our main results show that creative and non-creative firms share similar location factors, being that both creative and non-creative firms are positively influenced by the specialisation level in CI's of municipalities. However, accounting for neighbouring effects, we find that this effect is more spatially limited for creative firms whereas for fashion, non-creative and all firms this seems to be more geographically spread. Moreover, our results suggest that the unobservable '*creative milieu'* has a limited impact on new firm formation.

We have structured the paper as follows. In Section 2 we review the literature on the location determinants focusing on the state of the art for CI's. In Section 3 we present the model and the data. In Section 4 we present and discuss main results. Finally, in Section 5 we summarise main conclusions and we draw some policy implications.

2. Literature review

The analysis of location determinants of new manufacturing firms has been a major topic in Economics since the seminal work of Alfred Marshall (1890) about industrial districts. Not to mention that there have been an increasing number of publications in recent years due to a combination of different factors (i.e., the improvements in analytical econometric modelling and the access to more detailed databases). Generally speaking, the main objective of most of these studies is to find patterns that could be useful for economic agents to choose the most appropriate location of new firms / plants. However, as most of empirical contributions are about manufacturing firms[2], it is quite difficult to find contributions relating to CI's.

Economic dimension of cultural activities was mostly ignored by scholars until the seminal work of Cwi and Lydall (1977) that emphasised their economic impact over employment and production. After their contribution, this topic has been broadly

[2] See Arauzo-Carod et al. (2010) for a survey of this empirical literature.

analysed from different approaches, especially when the capacity of traditional manufacturing activities to fuel economic growth started to be criticised. This fact left room for cultural activities to help local economies in terms of economic development, competitiveness and as attraction mechanism of different economic and social agents.

Linked to cultural activities arise CI's. This term gets relevance after the publication of OECD's (2007) and UNCTAD's (2008) reports and the Creative Industries Task Force Mapping Document (DCMS, 1998 - 2001) by the British Government, where CI's are defined as "activities which have their origin in individual creativity, skill and talent and which have the potential for wealth and job creation through generation and exploitation of intellectual property" (DCMS, 2001, p. 5). According to DCMS (1998 - 2001) CI's include the following activities: Advertising, Architecture, Arts and Antique Markets, Crafts, Design, Designer Fashion, Film, Interactive Leisure Software, Music, Television and Radio, Performing Arts, Publishing and Software. Although this is one of the most complete definitions, in the literature we can find alternative definitions typically more restrictive, like the one provided by Del Corral (2000, p. 11-12) arguing that Cultural / Creative Industries are "those industries that combine the creation, production and commercialisation of contents which are intangible and cultural in nature. These contents are typically protected by copyright and they can take the form of goods or services". On this point some authors discuss that the nature of work in these kinds of industries is not necessarily creative. This ambiguity of classifications could be explained by the fact that "some creative products have a dual nature that divides their process in an intangible and a physical part, both with differentiated characteristics" (R.Boix, 2013 p. 67). Subsequently to previous methodological discussions it seems to be clear that defining a closed list of CI's is a rather complicated task which is out of the scope of this paper.

Regarding location patterns of CI's, it is worth noting that from the seminal contribution of Florida (2002a) the relevance of this subject has gained significance in many fields (i.e., urban planning, industrial policy, entrepreneurship, etc.). However, to our knowledge there are few studies referring to entry determinants of creative firms. Among the ones analysing this topic, most of them tend to relate new firm creation to cultural diversity. In this sense, Audretsch et al. (2010) find that higher levels of knowledge and cultural diversity affect positively the creation of technology oriented firms in Germany. For the US case, Lee et al. (2004) analyse the effect of creativity and diversity on new firm formation and find that open and creative areas favour a dynamic

entrepreneurship climate. In a similar approach, De Jong et al. (2007) use Dutch data to discuss the relationship between CI's and regional firm entry rates, showing that those areas with higher concentration levels of CI's have larger firm entry rates. Moreover, among the few specific case studies about the Fashion design industry, Wenting (2008) argues that the development of the fashion designer cluster in Paris was driven by the emergence of start-ups and knowledge spillovers between firms. And among the most recent studies there is the paper by Cruz and Teixeira (2014) where they analyse the location determinants of new creative firms for Portuguese municipalities, showing that location decisions of creative firms vary according the creative sector they belong to and their own characteristics.

In any case, agglomeration patterns of creative firms have been widely analysed showing that CI's tend to cluster in specific places, but usually in cities (see Lazzaretti et al., 2012 and Maskell and Lorenzen, 2004, among others). Concretely, Lazzaretti et al. (2012) considered four different approaches in order to explain the agglomeration patterns of these industries. The first approach links the existence of historical and cultural heritage to agglomeration of cultural and CI's (see Cinti, 2008, and Scott, 2000). The second approach is about the relationship between the effect of agglomeration economies and the organization of the industry. Concerning localisation economies, CI's may cluster to take advantage of the existence of local knowledge spillovers, skilled labour markets and local suppliers specialised in other parts of the creative *filière.* And about urbanisation economies, these can foster clustering of CI's if they benefit from a large local market and a diversified range of economic activities (Ciccone and Hall, 1996; Jacobs, 1969 and 1961; Ohlin, 1933). The third approach relies on the concept of 'related variety' and its contribution to the clustering of creative activities in terms of knowledge spillovers taking place among different subsectors, fostering creativity and innovation (Boschma and Iammarino, 2007). Finally, the fourth approach relies on Florida's (2002a) Creative Class concept (those workers whose economic function is to create new ideas, new technology or creative content) and on the 3T's theory. According to this theory there are some areas with high levels of Technology, Talent and Tolerance that act as poles for the Creative Class offering a '*creative milieu'* that attracts creative activities and high-skilled workers.

In line with the second approach, we expect that municipalities specialised in CI's should be more able to attract new firms because of the agglomeration advantages

created from the co-location of creative firms (localisation economies).[3] Moreover, municipalities specialised in CI's should generate knowledge spillovers in terms of creativity and innovation, leading new business development and growth in other industries (Scott, 2000; Lee et al., 2004; De Jong et al., 2007).

Hypothesis 1: the specialisation in CI's should enhance the location of all kind of firms, no matter if they are creative or not.

The aforementioned intangible '*creative milieu*'[4] has been used to suggest that there is a positive relation between the presence of artistic workforce in a place and economic competitiveness. This conjecture relies on the idea that the spatial concentration of artists ensures a singular, open and diverse environment, which attracts other talented and high-skilled workers, resulting in human capital and business creativity (see, for instance, Florida, 2002a and Lee et al., 2004). Although that most studies attempting to measure this atmosphere simply rely on the arts employment share as an explanatory factor of new firm formation, this association could be spurious if artists tend to concentrate in areas endowed with economic growth factors(Wojan et al., 2007). Nevertheless, Wojan et al. (2007) find an alternative way to measure this '*creative milieu*' using US data and showing a positive impact (even if small) of this '*creative milieu*' on economic development.

In line with Wojan et al. (2007), we wonder whether there are some intangible characteristics that attract both businesses and artists in a particular municipality. Concretely, in this paper we understand the unobservable '*creative milieu'* as a proxy measuring the image of a specific location that facilitates the attraction of creative talents and entrepreneurs (Hitters and Richards, 2002). Even if '*creative milieu*' is hardy measurable given that it is a non-observable atmosphere, it is expected to be more obvious for those individuals involved in the arts (let's say bohemians) since creativity is their essential job function (Lloyd, 2008; Andersson, et al., 2013). For this reason we expect that location decision of bohemians should reveal this *'creative*

[3] See Branzanti (2014) for a survey of studies focusing on district economies in the context of CI's.

[4] Nevertheless, there are some authors that have tried to define it, as Landry (2000, p.133) who considers that it is an area where "face-to-face interaction (among a critical mass of entrepreneurs, intellectuals, social activists, artists, administrators, power brokers or students) creates new ideas, artefacts, products, services and institutions and, as a consequence, contributes to economic success". A similar definition can be found in Santagata and Bertacchini (2011).

milieu'. At the same time, this '*creative milieu*' also can catch the attention of the most creative and innovative firms, attracting them to this area.

Hypothesis 2: the same unobservable 'creative milieu' that favours the agglomeration of bohemians also favours location of firms.

3. Data and model

3.1 Data

Data in this paper refers to Catalonia,[5] an autonomous region in north-eastern Spain whose capital is Barcelona. The data includes one dataset about the location of new plants (dependent variable) and another dataset about territorial characteristics (independent variables). The dataset about the location of new plants is the Register of Manufacturing Establishments of Catalonia (REIC) supplied by the Catalan Government (Ministry of Innovation, Universities and Enterprise) that has plant-level microdata on the location of new and relocated manufacturing plants.[6] This dataset includes 10,033 manufacturing plants with codes 011 to 930 that located in Catalonia between 2002 and 2007.

As mentioned before, the choice of the classification of CI's is not an easy task. In this paper we follow the proposal of UNCTAD (2008) as it is the broader in terms of industries considered. In addition, this classification is the most widely accepted among researchers (see Boix and Lazzaretti, 2012, among others). We also have contemplated creative sectors such as Fashion, Architecture and Research activities considered in the DCMS' classification, which are relevant sectors in the Catalan economy. We bear in mind that some CI's involve manufacturing activities (e.g. Clothing and Printing) that could not incorporate creative workers, but we assume that there is a creative factor which dominates through all the process. Although that we could focus on the most creative component of the industry (e.g., Fashion Design or Publishing), some authors argue that both components should be taken into account

[5] Catalonia has about 7.5 million inhabitants (15% of Spain's population) and an area of 31,895 km^2. It accounts for 19% of the Spanish GDP.

[6] See Manjón-Antolín and Arauzo-Carod (2011) for a detailed analysis of the interrelations between locations and relocations using the same dataset. Their results show that location patterns of both new and relocated firms are quite similar. Even so, we estimated the same models using only new plants and results did not change significantly.

due to "their strong interrelation in terms of input-output linkages and spatial co-location" (Boix, 2013 p. 65).[7]

Therefore, we include 26 creative sectors with codes 177 to 925 (see NACE-93 industry classifications in Table 1)[8]. According to that, REIC's dataset reports 798 new creative establishments. We classified this dataset into four dependent variables given that we assume that location determinants may differ across these groups:[9]

- *Entry_t* refers to all firm entries during this period without industry distinctions (222 three digit NACE sectors).
- *Entry_ncrea* refers to non-creative firms entries (196 sectors).
- *Entry_crea* takes into account all creative firms entries (26 sectors).
- *Entry_fashion* only takes into account firm entries related to Clothing and Fashion activities (7 sectors).

[INSERT TABLE 1 HERE]

The dataset about local characteristics of all 946 Catalan municipalities is mainly taken from Trullén and Boix (2005), the Catalan Statistical Institute (Census 2001, IDESCAT) and the Catalan Cartographical Institute. We include some explanatory variables that are widely used in empirical location literature, such as:

- *Human capital*: percentage of employment with technical studies (*ptech*) and university degree (*puni*) relative to the number of jobs
- *Agglomeration economies*: jobs density (*jobs_dens*) and a ratio between the number of jobs and population (*job_pop*)
- *Industrial mix*: percentage of manufacturing jobs (*job_ind*) and services (*job_ser*), percentage of small firms (*psmall*)[10] and percentage of employment in high-knowledge services (*job_hk_ser*)
- *Geographical and administrative issues*: distance to the provincial capital (*dist_pro*), county capitals (*cap_cou*), shore-line areas (*seaside*)

[7] In order to account for both components Boix (2013) differentiates between "pure CI's" and "semi-CI's". Pure CI's could include activities such as Publishing, Design, Music or Performing Arts, among others, while semi-CI's involves activities as Printing, Clothing, Housing goods or Toys manufacturing, among others.

[8] Actually, we use a five-digit NACE aggregation for our entry dependent variables since this should bring us accurate results.

[9] We defined several dependent variables according "pure CI's" and "semi-CI's" classification to account for industry specificities. However, we decided to analyse only all CI's aggregation and Fashion industries entries since other industry aggregations have only a few firms.

[10] Variable *psmall* refers to the percentage of firms with up to 50 workers.

We include a Specialisation Index in Creative Industries *(sici)* as key explanatory variable in order to measure the influence of a specialised employment in CI's as a determinant for the location decision of firms (see section 3.2 for details). Previous variables are summarised in Table 2 and Table 3 shows some descriptive statistics.

[INSERT TABLE 2 HERE]
[INSERT TABLE 3 HERE]

In order to account for spatial dependence, we also consider the spatially lagged counterparts of some of the independent variables using a spatial neighbour matrix (*W*). These matrices can be designed using different approaches (distance-based neighbours, *k*-nearest neighbours, contiguous neighbours and inverse-distance-based neighbours) and we have decided to follow that of Arauzo-Carod and Manjón-Antolín (2012) used for the same geographical area (i.e., a distance-based matrix with a neighbouring criterion of 60 km).[11]

We assume that education (*ptech*, *puni*) is an important location factor no matter firm's characteristics. However, commuting flows may solve spatial mismatch in labour market if there are appropriate transport infrastructures (Arauzo-Carod, 2005). There is a wide consensus about the more productive environment (which is preferred by firms) generated by agglomeration economies (*job_dens*, *job_pop*), being that areas with higher levels of such economies are able to attract a larger number of new firms. Industrial mix (*job_ind*, *job_ser*) helps to capture local economic structure and contributes to explain location decisions taken by firms as well as availability of advanced services do (*job_hk_ser*). Similarly, the existence of a wide number of small firms (*psmall*) typically fosters firm location, as suggested by incubator Hypothesis (Garofoli, 1994). Obviously geography and institutionally issues matter (Guimarães et al., 2000), as firms need good accessibility to services provided at cores, so it is necessary to control for geographical position of the municipalities (*seaside*), their distance to main cities (*dis_pro*) and their institutional relevance (*cap_cou*). Finally, we expect that municipalities more specialised in CI's (*sici*) should favour the entry of all

[11] Arauzo-Carod and Manjón-Antolín (2012) analyse location determinants of new manufacturing plants in Catalonia and try to determine the geographical scope that should be considered when dealing with location issues. They compare several distance W-matrices with criteria ranging from 10 km to 100 km using the log-likelihood function, the Akaike information criterion and the chi-square goodness-of-fit test, and they find out that the best fit was achieved by the 60 km W matrix. Because their dataset is exactly the same as the one used in this paper, we can therefore use a 60 km W matrix as a neighbourhood criterion.

kind of firms due to knowledge spillovers in terms of creativity and innovation arising from the co-location of creative firms. Results for this explanatory variable would allow us to test our first hypothesis.

Moreover, in order to test our second hypothesis about the effects of the unobservable '*creative milieu*' on location decision of firms we follow Wojan et al. (2007). A two-step procedure is applied: first, we model what explains bohemian's concentration, and then we use the residual from this regression to check whether '*creative milieu'* really matters in location decision of firms. Concretely, our measure (i.e., dependent variable) is the density of bohemians per km^2.[12] This measure has been built up using data from the 2001 Census provided by IDESCAT. We define bohemians as those employees closely related to artistic jobs such as musicians, dancers, actors, and painters, among others. This measure of bohemians includes those from code 251 of the CCO-94 Professional Categories Classification[13] in a similar way as in Wojan et al. (2007) and Florida (2002a).[14]

Respect to explanatory variables (also from 2001 Census) they are the following ones:

- *Art demand measures:* percentage of population enrolled in college (ppopuni), the general taxable income by taxpayer (*income*) and percentage of households without any familiar link (*pnonfamily*)
- *Community amenities:* percentage of foreign born population (*foreign*), density of gay couples (*gay_density*) and number of cultural goods of national interest (*heritage*)[15]
- *Settlement:* population density (*pop_density*), percentage of commuters outside the municipality (*commuting*) and residential population change between 1991 and 2001(*pop91-01*)

These explanatory variables have been chosen in order to explain the main attraction factors for bohemians.[16] Firstly, we expect the concentration of bohemians in a

[12] Initially we wanted to use the arts employment share as in Wojan et al. (2007), but after analysing its spatial distribution we realised that this measure did not fit to our dataset. In other words, some municipalities with higher percentage of bohemians are lacking in population and economic activity, so the weight of bohemians was overestimated. So, if we controlled for municipality surface, we can solve this problem and get a more realistic measure.

[13] For this reason we do not consider industry with code 923 (this sector partially includes all professionals involved in Sector 251 (CCO-94)) in our classification of CI's in order to avoid some endogeneity problems.

[14] See also Andersson et al (2013), Markussen (2006), Lee et al. (2004) and Florida (2002b) for related approaches.

[15] In alternative specifications we used other variables related to community amenities as number of museums and galleries or non-profit organizations, but they were highly correlated with population density.

municipality to be higher where demand for arts and cultural assets is likely to be high. In this way, proportion of population enrolled in college (demand for cultural assets is higher), the median household income (income elasticity of demand for cultural assets uses to be high) and percentage of non-family households (as a proxy for market capacity, as individuals without family ties should be more prone to cultural consumption) should favour the agglomeration of bohemians. Secondly, we consider that location decision of bohemians is determined by residential amenities proxied by the following variables: percentage of foreign born population (as a diversity and cosmopolitan measure), density of gay couples (as a tolerance measure)[17] and the number of cultural assets of national interest (those places are essential sources of inspiration for artists). Thirdly, regarding settlement characteristics, although population density could have an ambiguous impact on bohemians' concentration we expect artists to be mostly concentrated in dense municipalities with high availability of services (including cultural assets). The proportion of the employed residents commuting outside the municipality should have a negative impact on bohemian's density, because of the lower level of interaction in those places. Finally, residential population change between 1991 and 2001 may capture other local amenities not included in the specification.

3.2 Stylised facts about creative industries and firms' location: SICI index

According to the REIC dataset, 10,033 establishments were located o relocated between 2002 and 2007 in Catalan municipalities, 798 of them belonging to the aforementioned standardised classification of CI's.

[INSERT FIGURE 1 HERE]

Figure 1 shows that roughly 75% of new and relocated firms were agglomerated in the Metropolitan Area of Barcelona (MAB) and to a lesser extent around the rest of provincial capitals. Thus, it seems clear that one of the most essential determinants of firms' location decision are agglomeration economies, advantages (specialised labour markets, availability of suppliers and knowledge spillovers) existent in dense areas.

[16] Main descriptive statistics are available upon request.

[17] According to Florida (2002a, 2002b), higher levels of gay people in a city ensure openness and tolerance which attracts artists. In this paper, we use density of gay couples. Even if this measure is not as accurate as we want, we assume that higher densities of gay couples give evidence that this is an open-minded municipality where its inhabitants approve alternative lifestyles.

[INSERT FIGURE 2 HERE]

Figure 2 compares location patterns of creative and non-creative firms and shows that, although most of them agglomerate around Barcelona, non-creative firms are slightly more geographically dispersed whilst CI's tend to be slightly more clustered, particularly in Textile, Publishing and Printing industries. In this way, we can see how new creative firms are located in municipalities as Igualada, Terrassa or the MAB, areas with a longstanding tradition on these industries. Regarding non-creative firms, they tend to locate near the bigger capitals and where manufacturing activity and population are concentrated.

Aiming to find a location pattern for CI's in Catalonia we calculate a Specialisation Index in CI's (SICI) using data from the Census 2001. The same index has been used for other scholars before but under different specifications as Lazzaretti and Boix's Location Coefficient (2012) or Florida's Creativity Index (2002a). This index compares the relative specialisation of a municipality in a sector regarding the national (Catalan) average and is defined as:

$$SICI_{ij} = (L_{ij}/L_j) \,/\, (L_i/\mathrm{L}) \qquad (1)$$

, where L_{ij} is the workforce in the creative industry j in a municipality i, L_j is the total workforce in the creative industry j, L_i is the total workforce in a municipality i, and L is total employment in the area (Catalonia). A SICI above 1 indicates that the clustering of a creative industry j in a municipality i is larger than the national average, so that the municipality is specialised in CI's.[18]

[INSERT FIGURE 3 HERE]

Figure 3 portraits the spatial distribution of SICI. Generally speaking, higher SICI values are reported near to MAB whilst inland and mountain areas tend to get values below 0.6. As in later areas municipalities are less populated, they have a less

[18] SICI Index does not take into account employment in CI's 366, 748 since this level of aggregation involve some non-creative activities, and 923 to avoid endogeneity problems with bohemian's model.

diversified industrial structure, which prevents from developing an appropriate environment needed to enhance CI's.[19]

3.3 Model

3.3.1. Location determinants

In order to analyse the determinants of location decision of firms and their relationship with CI's specialisation, we estimate the number of new and relocated establishments in a municipality as function of the local specific characteristics that we have described before:

$$Y_i = \beta_0 + \beta_1 ptech_i + \beta_2 puni_i + \beta_3 job\_den_i + \beta_4 job\_pop_i + \beta_5 job\_ser_i + \beta_6 job\_ind_i + \beta_7 psmall_i + \beta_8 job\_hk\_ser_i + \beta_9 sici_i + \beta_{10} dist\_pro_i + \beta_{11} cap\_com_i + \beta_{12} seaside_i + u_i \quad (2)$$

, where Y_i is the number of plants located in a municipality *i*. Our empirical strategy consist on estimating four different models sharing the same set of explanatory variables with different dependent variables (Y_i)[20]: all firms (*entry_t*), non-creative firms (*entry_ncrea*), creative firms (*entry_crea*) and fashion firms (*entry_fashion*).

Regarding the econometric estimation, Count Data Models are quite used in recent years when dealing from this location phenomenon from a spatial point of view, i.e., when trying to explain how local characteristics of different sites (e.g., municipalities, counties, regions) may influence firms' decisions. From these models, Poisson ones appear to be the starting point, but they suffer from some limitations. They assume that the mean and variance should be equal, but it is usually violated when dealing with location decisions because of the concentration of entries in some areas, which involve an overdispersion problem. This problem can be solved by the generalised form of the Poisson model (the Negative binomial model) that introduces an individual unobserved effect into the conditional mean which allows the variance to exceed the mean.

Moreover, location analysis deals with an additional problem, that of zero inflation (i.e., sites where no plants are located), that can be easily solved by using zero inflated counterparts of previous models. Those models are two-steps models in which the first

[19] However, there are some exceptions at some small villages traditionally specialised in Textile and Paper and Pulp industries where from XIXth century but without the key determinant factors needed for the development of CI's (Diversity, Talent and Technology).

[20] Actually, the key variable SICI is substituted in fashion firm's model by a SICI in clothing sectors (*sici_fashion*) which includes employment in 177, 181, 182, 183, 181, 192 and 193 sectors.

step is used to model the probability of belonging to the zero-group vs. the non-zero group (in terms of location at specific sites) while the second step is a traditional count model. These models require additional variables (i.e., inflated variables) that are hypothesised to explain zero inflation.

As descriptive statistics of dependent variables showed signs of both overdispersion and zero inflation[21], a basic Poisson model was initially discarded and alternative count data models were considered (i.e., Negative Binomial -NB-, Zero-Inflated Poisson -ZIP- and Zero-Inflated Negative Binomial -ZINB-). Therefore, we estimated a baseline specification, compared it through previous count data models (including Poisson as a baseline one) and selected the one with the best fit using the Akaike information criterion (AIC), the Bayesian information criterion (BIC) and the Vuong test (Vuong, 1989).

[INSERT TABLE 4 HERE]

Table 4 illustrates the results of these statistics showing that the ZINB is the one that performed best according to AIC and BIC. As the Vuong test also favoured the ZINB over the NB we decided to use the ZINB for all the specifications.[22]

3.3.2 Location decision of bohemians and the unobserved 'creative milieu'

In previous pages we have discussed whether creative activities are linked to some non-measurable creative atmosphere ('*creative milieu*') that may favour or enhance feasibility of these activities. In order to do that, we follow a similar strategy than that of Wojan et al. (2007). Concretely, we estimate by OLS what explains bohemian's density[23] at municipality level and we assume that residual of this regression should contain the unobserved effects that capture the '*creative milieu'*.

[21] Concretely, zeroes were 34.67% for total entries, 35.20% for non-creative entries, 81.62% for creative entries and 91.12% for fashion entries.

[22] However, we also estimated the same model by NB because it seemed to be nearly as appropriate as ZINB according to the chi-square goodness of fit test (Manjón-Antolín and Martínez-Ibañez, 2014). Results are available upon request, but they are quite similar.

[23] See section 3.1 for details about these explanatory variables. It should be taken into account that here we are using artistic occupations (CCO-94) which is different from employment in CIs (NACE-93) that we use to calculate SICI index.

$$Bohemian's\ density\ (2001) = \beta_0 + \beta_1 ppopuni_i + \beta_2 income_i + \beta_3 pheritage_i + \beta_4 foreign_i + \beta_5 gay\_density_i + \beta_6 heritage_i + \beta_7 pop\_density_i + \beta_8 commuting_i + \beta_9 pop91-01_i + v_i \quad (3)$$

If this is an appropriate specification, the residual v should contain the unobserved effects that proxy the '*creative milieu'* of the municipality and it can be included at main equation (1) as an additional explanatory variable (v^*).

$$Y_i = \beta x_i + \theta v^*{}_i + \varepsilon_i \quad (4)$$

If we get a positive coefficient θ we can accept the hypothesis of a common unobserved factor (i.e., a '*creative milieu*') that attracts both bohemians and firms.

4. Results

Our estimation strategy is structured as follows. First, we compare location determinants of the several group of firms considered focusing on SICI's impact. Then, we estimate the bohemian location decision's model in order to obtain its residual and later we include this residual in the first specification as an additional explanatory variable proxying the '*creative milieu'* effect. Finally, we incorporate spatial lagged variables. All these estimates are presented for sub-samples of metropolitan (1), non-metropolitan municipalities (2), as well as for all municipalities (3).[24]

[INSERT TABLE 5 HERE]

The results for the first model are shown in Table 5. For all and non-creative firms all explanatory variables are significant. More specifically, jobs density, as a proxy of

[24] The metropolitan and non-metropolitan sub-samples are obtained by using a dummy variable defined by Trullén and Boix (2005) for Catalan municipalities. Although creative workers are supposed to be concentrated in metropolitan areas, we can find several exceptions. Therefore, by doing this distinction we could verify whether there are significant differences in location determinants among both areas. Additionally, this distinction allows us to increase the likelihood of identifying a significant *'creative milieu'* effect (in case it exists), since "the structural simplicity of non-metro economies imparts a more direct relationship between '*creative milieu'* and any observed dynamism" (Wojan et al. 2007, p. 712). Other sub-samples have been tested and rejected.

agglomeration economies, acts positively; larger distances to province capitals reduces entries whilst seaside and county capitals municipalities increase entries; manufacturing and service workforce shares increase entries but SMEs shares reduces them, showing that these firms are not favouring start-ups (see Arauzo-Carod and Manjón-Antolín, 2012); educational characteristics act in an opposite way as whilst technical studies foster firms' location higher educational levels prevent them, as shown in many other analyses (see Arauzo-Carod and Manjón-Antolín, 2004; Arauzo-Carod and Viladecans-Marsal, 2009; among others); finally, results show that specialisation in CI's is significant for all and non-creative firms supporting our hypothesis that municipalities specialised in CI's are more likely to attract new businesses.

For creative firms, and their locational patterns seem to slightly differ. In terms of territorial characteristics, creative firms are attracted to areas with high job densities, located at the sea side and being county capitals, as there it may be easier to exchange ideas and to find large consumer markets prone to the concentration of creative workers and firms. Location of these firms is favoured by specialisation in manufacturing activities thanks to local related variety that benefits from inter-sectorial and transversal synergies (Lazzaretti et al., 2012). However, shares of SMEs do not help to attract new creative firms. Surprisingly, higher educational levels deter location of new firms. Finally, local specialisation in creative activities strongly attracts new ones, surely due to agglomeration economies emerging from these firms.

Finally, as results for fashion firms show that only few variables matter (i.e., job density, high-knowledge services employment and shore-line amenities), we guess that location determinants rely on specific local characteristics not included in previous specifications. Moreover, our specialisation index in fashion industries has a positive and significant effect on the entry of fashion firms indicating a strong dependence on existent localization economies around these activities.

Comparing the results of the four estimations, it is shown that traditional location determinants are quite similar for both creative and non-creative firms, but not for the fashion ones. Also, we have found that both non-creative and creative firms are influenced by local specialisation in CI's, since in those places they can benefit from higher levels of creativity that favour emergence of new firms.

Regarding differences among metro and non-metro sub-samples results slightly vary. For all and non-creative firms, technical studies workforce share fosters location of firms in non-metro municipalities whereas high-knowledge services workforce share and sici only favour firm entry in metro ones. For creative firms, higher levels of education deter creative firm entries exclusively in metro areas whereas jobs density and percentage of industrial workforce only favour firms' entries in metro areas. Moreover, geographical and institutional factors seem to exclusively affect location decisions in metro areas. Finally, for fashion firms educational levels only influence entries in non-metro municipalities.

The second step in our empirical strategy is the identification of those variables that may be associated with location decision of bohemians. Estimation results can be found in Table 6. Generally speaking, higher bohemian densities are found in areas with high incomes, higher presence of gay couples and densely populated. These results were foreseeable in view that municipalities with higher income should be more able to demand art goods and services, and areas with higher gay people and population concentrations provide an environment prone to the exchange of ideas and alternative lifestyles, as well as the accessibility of cultural amenities. However, population change between 1991 and 2001 has a negative and significant effect on bohemian's density. If we take into account differences between metro and non-metro areas, we observe that both areas have as bohemian magnets density of gay couples and population density, showing that bohemians prefer to agglomerate in open-minded and cosmopolitan areas with good accessibility to cultural services. In contrast, metro and non-metro areas differ in terms of income levels, percentage of households without any familiar link and population growth.

[INSERT TABLE 6 HERE]

Having estimated bohemians' model by OLS we are able to obtain the unexplained variation in the bohemian density, a residual proxying the '*creative milieu'* that will be added to the first model in order to test if those intangible factors that attract bohemians also help to attract firms.

[INSERT TABLE 7 HERE]

Table 7 shows results with *'creative milieu'*. Coefficient estimates do not differ substantially from our first model, so now we focus on this new parameter. Results show that the unobservable '*creative milieu'* has a positive impact in nearly all kind of entries (total, non-creative, creative and fashion). However, this positive association cannot be confirmed as this variable is non-significant. We guess that firms firstly account for traditional location factors (i.e. agglomeration, accessibility, labour market, etc.) and other factors like a creative atmosphere play a secondary role in location decisions (Murphy et al. 2014). Consequently, we cannot confirm our hypothesis relative to role played by *'creative milieu'* in attracting firms.

[INSERT TABLE 8 HERE]

Finally, we estimate an enlarged location decision model in order to account for inter-municipal neighbouring externalities (see Table 8). Almost all the key location determinants remain significant as in previous estimations. However, adding spatial lagged variables highlight some interesting facts. Among them, differences between negative and positive signs of individuals with higher education measured at a municipality level or at a neighbour municipalities level can be explained in terms of wider geographical scope of labour markets (i.e., they go beyond municipalities' borders). A similar effect is found for the existence of SMEs, as the negative effect at local level turns to be positive at the extended spatial level (except for Fashion firms) signalling that SMEs effects may extend beyond each municipality boundaries.

Lastly, the most relevant results are sici and creative milieu's spatial spillover effects. Whereas for non-creative, fashion and all firms the presence of specialised pools of creative workers in nearby municipalities has a positive and highly significant effect on the entry of new firms, creative firms seem to be only affected by the specialisation in CI's at a local level. This can be understood in that creative firms are mainly attracted by relevant or large urban centres where they can find a great related variety and large consumer markets. This evidence has been emphasised by other scholars as Cruz and Teixeira (2014) and Wojan et al. (2007) and highlights interesting differences in spatial scope of creative industries' externalities depending on firms' activity. Regarding creative milieu's effect, we find that existence of a creative atmosphere in nearby municipalities favours the entry of fashion and creative firms. This result supports our previous result about second role played by intangible factors in firms' location decisions.

5. Conclusions

Main contributions of this article to the literature on location determinants of Creative Industries (CI's) are three: first, we analyse location determinants of CI's from a territorial perspective in a wider way (i.e., not departing from a case study as in many studies) in order to get an overview of general location determinants; second, we analyse if specialisation in CI's favours location of all types of firms, being that the answer is yes; third, we explore whether there is an unobserved *'creative milieu'* favouring new firms' location, being that the (preliminary) answer is no, although there is much work to be done about this particular.

Our econometric results show that location determinants of creative and non-creative firms are quite similar and both creative and non-creative firms are positively affected by the specialisation in CI's in terms of workers. However, when we take into account spatial neighbouring externalities we find that this specialisation in CI's shows a spatial limited effect in the case of creative firms whereas fashion, non-creative and all firms are influenced by neighbouring specialisation in CI's. Moreover, our results show that the same unobserved '*creative milieu*' that favours the existence of bohemians does not influence the entry firms.

Considering these results, we can draw some policy implications. Once having demonstrated the positive role played by CI in terms of new firms' attraction, firm entry promoting policies should favour spatial clustering of creative workers by encouraging the development of those creative activities in which the municipality could have some tradition in (e.g. by supporting existing creative firms, assisting creative start-ups, strengthening creative business networks and marketing city's image). According to the observed effect of spatial externalities, creative firms' location behaviour is strongly influenced by municipality characteristics and not by neighbouring municipalities ones. This suggests that regional policies should focus on stimulating the specialisation in CI's at a local level rather than in extensive areas. Finally, local authorities pursuing a diversified economy strategy should encourage social and cultural interaction able to develop a particular '*creative milieu'* that could provide them some comparative advantage when traditional location factors are already satisfied.

Even though all these facts, we are aware of the main limitations of this work. In this sense, future extensions should focus on analysing location behaviour of specific CI's

instead of grouping them given that our overall results may blur some heterogeneities given the locational specificities of the creative activities included in our data set. The approach to the '*creative milieu'* effect could be susceptible to omitted variables critiques, where '*creative milieu*' is reduced to a misspecification error. For this reason we should try to refine the way in which the unobservable '*creative milieu*' is measured. Moreover, using more disaggregated data would allow us to discriminate between 'pure-creative' and 'semi-creative' activities reducing potential bias of results.

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Tables

Table 1. Creative firms entries by NACE-93 Classification

Code	Creative industries	Entries 02-07
177	Manufacture of knitted and crocheted apparel	16
181	Manufacture of leather clothes	1
182	Manufacture of other wearing apparel and accessories	302
183	Dressing and dyeing of fur; manufacture of articles of fur	17
191	Tanning and dressing of leather	1
192	Manufacture of luggage handbags and the like saddlery and harness	13
193	Manufacture of footwear	1
221	Publishing	6
222	Printing and service activities related to printing	322
223	Reproduction of recorded media	7
362	Manufacture of jewellery and related articles	63
363	Manufacture of music instruments	4
365	Manufacture of games and toys	9
366	Other manufacturing activities (as costume jewellery)	7
642	Telecommunications	0
721	Hardware consultancy	0
722	Software consultancy and supply	0
731	Research and experimental development on natural sciences and engineering	0
732	Research and experimental development on social sciences and humanities	0
742	Architectural and engineering activities and related technical consultancy	21
744	Advertising	1
748	Other economic activities (as photography and design)	6
921	Motion picture and video activities	2
922	Radio and television activities	0
924	News agency activities	0
925	Library archives, museums and other cultural activities	0
	Total creative firms entries	**798**

Source: Authors' calculations with data from the REIC and IDESCAT.

Table 2. Variables definitions and sources

Variable	Definition	Source
entry_t	Total number of entries of firms (02-07)	REIC
entry_crea	Total number of entries of creative firms (02-07)	REIC
entry_ncrea	Total number of entries of non-creative firms (02-07)	REIC
entry_fashion	Total number of entries of fashion firms (02-07)	REIC
bohemians_density	Bohemians per km^2	IDESCAT (2001)
Ptech	Technical studies workforce share (1^{st} + 2^{nd} degree)	IDESCAT (2001)
Puni	Graduate workforce share (bachelors' degree + PhD studies)	IDESCAT (2001)
job_den	Density of jobs per km^2	IDESCAT (2001)
job_pop	Ratio of number of jobs per population	IDESCAT (2001)
job_ser	Percentage of service employment	IDESCAT (2001)
job_ind	Percentage of industrial employment	IDESCAT (2001)
Psmall	Percentage of small firms in the municipality	IDESCAT (2001)
job_hk_ser	Percentage of employment in high-knowledge services	IDESCAT (2001)
Sici	Specialisation Index in CI's	Own calculations
sici_fashion	Specialisation Index in Fashion Industries	Own calculations
creative_milieu	'*Creative milieu'* residual from bohemians model	Own calculations
dist_cappro	Distance to the province capital (in thousands)	Trullén and Boix (2005)
cap_com	It indicates if the municipality is a capital of county (1) or not (0)	Trullén and Boix (2005)
Seaside	It indicates if the municipality is beside the sea (1) or not (0)	Trullén and Boix (2005)
Met	It indicates if the municipality belongs to a metropolitan area (1) or not (0)	Trullén and Boix (2005)
Pop	Population in thousands (Only used in the inflated part of the model)	IDESCAT (2001)
Ppopuni	Percentage of population enrolled in college	IDESCAT (2001)
Income	General taxable income by taxpayer (thousand euros)	IDESCAT (2001)
Foreign	Percentage of population foreign born	IDESCAT (2001)
pnonfamily	Percentage of all households non-family	IDESCAT (2001)
gay_density	Density of gay couples per km^2	INE (2001)
Heritage	Number of cultural assets of national interest per county	IDESCAT (2001)
pop_density	Density of population per km^2	IDESCAT (2001)
commuting	Percentage of population that commutes to other municipalities	IDESCAT (2001)
pop91-01	Population change 1991 to 2001	IDESCAT (2001)

Source: Authors

Table 3. Descriptive statistics of explanatory variables

Variables	N	Mean	Sd	Min	Max
job_pop	946	0.437	0.049	0.000	0.582
job_den	946	0.171	0.669	0.000	8.991
dist_pro	946	43.31	27.41	0.000	135.9
cap_com	946	0.043	0.204	0.000	1.00
seaside	946	0.074	0.262	0.000	1.00
met	946	0.445	0.497	0.000	1.00
job_ind	946	0.222	0.116	0.000	0.610
job_ser	946	0.473	0.259	0.000	1.00
pop	946	6.702	51.712	0.000	1503.884
psmall	946	0.837	0.237	0.000	1.00
sici	946	0.522	0.571	0.000	5.195
sici_fashion	946	1.029	1.839	0.000	20.38
job_hk_ser	946	0.061	0.103	0.000	0.825
ptech	946	0.158	0.051	0.000	0.364
puni	946	0.163	0.062	0.023	0.500
creative_milieu	946	-0.000	1.474	-25.996	25.663

Source: Authors' calculations with data from Boix and Trullén (2005) and Idescat (2001)

Table 4. Estimation tests

Model 1 (Global)	**AIC**	**BIC**	**Vuong test**
Poisson	12453.48	12516.56	-
Negative binomial	4747.717	4815.649	-
Zero-inflated Poisson	10815.14	10887.93	6.85***
Zero-inflated negative binomial	4576.929	4654.565	5.84***
Model 2 (Non-Creative)	**AIC**	**BIC**	**Vuong test**
Poisson	11819.01	11882.09	-
Negative binomial	4692.44	4760.371	-
Zero-inflated Poisson	10108.15	10180.94	7.11***
Zero-inflated negative binomial	4520.089	4597.725	5.93***
Model 3 (Creative)	**AIC**	**BIC**	**Vuong test**
Poisson	1686.002	1749.081	-
Negative binomial	1209.071	1277.002	-
Zero-inflated Poisson	1397.842	1470.625	3.15***
Zero-inflated negative binomial	1116.916	1194.552	5.31***
Model 4 (Fashion)	**AIC**	**BIC**	**Vuong test**
Poisson	935.853	998.932	-
Negative binomial	675.331	743.262	-
Zero-inflated Poisson	715.209	787.992	3.03***
Zero-inflated negative binomial	635.697	713.333	3.53***

*** p<0.01.** p<0.05. * p<0.1

Source: Authors' calculations

Table 5. Location determinants of firms (ZINBM)

	All firms			Non-creative			Creative			Fashion		
Firm Entries	**(1) Metro**	**(2) Non_Metro**	**(3) Total**	**(1) Metro**	**(2) Non_Metro**	**(3) Total**	**(1) Metro**	**(2) Non_Metro**	**(3) Total**	**(1) Metro**	**(2)Non_Metro**	**(3) Total**
ptech	0.488	5.648***	4.007***	0.498	5.759***	4.102***	0.450	-1.591	2.893	-5.138	-20.86**	-2.774
	(2.044)	(1.358)	(1.102)	(2.049)	(1.362)	(1.109)	(4.316)	(4.503)	(2.847)	(7.352)	(9.523)	(4.951)
puni	-1.942*	-2.345	-1.689**	-1.741	-2.310	-1.581*	-3.686**	3.126	-2.767*	0.111	19.12***	0.167
	(1.104)	(1.475)	(0.850)	(1.085)	(1.480)	(0.846)	(1.824)	(3.935)	(1.587)	(2.862)	(6.662)	(2.540)
job_den	0.206***	1.832***	0.326***	0.192**	1.796***	0.309***	0.193**	0.315	0.295***	0.354***	-0.156	0.372***
	(0.078)	(0.510)	(0.084)	(0.075)	(0.502)	(0.082)	(0.079)	(0.429)	(0.083)	(0.116)	(0.470)	(0.127)
job_pop	2.361*	7.701***	4.661***	2.102*	7.555***	4.438***	6.206	11.36**	9.181***	2.294	6.514	9.045
	(1.269)	(1.571)	(0.959)	(1.258)	(1.577)	(0.960)	(3.877)	(4.746)	(3.095)	(7.883)	(8.218)	(5.667)
job_ser	0.766	0.391	0.860***	0.678	0.357	0.819***	-0.384	0.914	0.374	-2.595	3.097	-0.779
	(0.505)	(0.342)	(0.290)	(0.505)	(0.343)	(0.292)	(1.054)	(1.124)	(0.783)	(1.734)	(2.497)	(1.297)
job_ind	5.611***	1.849**	3.908***	5.579***	1.805**	3.884***	4.609**	2.913	3.694***	3.900	3.752	3.481
	(1.002)	(0.729)	(0.595)	(0.987)	(0.731)	(0.594)	(1.869)	(1.889)	(1.306)	(3.288)	(3.352)	(2.207)
psmall	-1.254***	-1.032***	-1.380***	-1.294***	-1.035***	-1.367***	-0.748	0.401	-0.655	-1.267	-2.175	-1.146
	(0.368)	(0.316)	(0.244)	(0.363)	(0.316)	(0.244)	(0.659)	(0.848)	(0.518)	(1.121)	(1.554)	(0.877)
job_hk_ser	4.744***	1.315	3.233***	4.681***	1.309	3.190***	6.202***	4.425*	5.565***	7.602***	3.451	7.307***
	(1.018)	(0.852)	(0.704)	(0.999)	(0.847)	(0.699)	(1.736)	(2.543)	(1.413)	(2.796)	(4.017)	(2.229)
sici [a]	0.313*	0.129	0.348***	0.226	0.0799	0.293**	1.192***	0.677***	0.818***	-	-	-
	(0.176)	(0.131)	(0.116)	(0.170)	(0.132)	(0.116)	(0.294)	(0.191)	(0.191)			
sici_fashion	-	-	-	-	-	-	-	-	-	0.581***	0.408***	0.406***
										(0.163)	(0.078)	(0.099)
dist_cappro	-0.00935**	-0.0101***	-0.0113***	-0.009**	-0.010***	-0.011***	-0.021**	-0.008	-0.015***	0.005	-0.019	-0.013
	(0.005)	(0.003)	(0.002)	(0.005)	(0.003)	(0.002)	(0.009)	(0.007)	(0.005)	(0.016)	(0.015)	(0.008)
cap_com	0.769**	1.206***	0.953***	0.755**	1.191***	0.933***	0.610*	0.646	0.697***	0.001	-0.624	0.005
	(0.305)	(0.239)	(0.192)	(0.296)	(0.237)	(0.190)	(0.340)	(0.418)	(0.259)	(0.509)	(0.791)	(0.418)
seaside	0.704***	0.785***	0.729***	0.664***	0.776***	0.700***	0.877***	0.248	0.737***	0.838**	-0.857	1.109***
	(0.193)	(0.237)	(0.151)	(0.188)	(0.236)	(0.150)	(0.274)	(0.586)	(0.242)	(0.412)	(1.172)	(0.366)
Constant	0.187	-2.208***	-0.982*	0.395	-2.143***	-0.880	-3.975*	-8.193***	-6.013***	-1.785	-5.213	-5.903**
	(0.844)	(0.818)	(0.554)	(0.829)	(0.820)	(0.554)	(2.195)	(2.593)	(1.643)	(3.802)	(3.666)	(2.729)
Inflated variables												
pop	-7.149***	-5.854***	-6.194***	-4.721***	-5.664***	-5.189***	-0.667***	-3.294***	-1.623***	-0.333***	-3.959***	-1.442***
	(2.145)	(1.380)	(1.114)	(1.123)	(1.337)	(0.954)	(0.240)	(0.912)	(0.457)	(0.109)	(1.502)	(0.552)
constant	2.358***	1.433***	1.704***	1.784***	1.394***	1.501***	1.821***	4.416	2.797	1.972***	6.406***	2.851***
	(0.633)	(0.387)	(0.320)	(0.437)	(0.380)	(0.295)	(0.494)	(0.938)	(0.525)	(0.476)	(1.958)	(0.747)
Vuong Test	5.04***	3.80***	5.84***	5.26***	3.80***	5.93***	3.73***	3.64***	5.31***	2.77***	1.77**	3.53***
N	420	526	946	420	526	946	420	526	946	420	526	946
Non zero obs.	319	299	618	315	298	613	122	52	174	62	22	84
LR X^2	316.01	243.06	643.41	300.67	234.88	613.08	161.32	63.90	239.72	85.44	63.25	129.58
Log likelihood	-1250.325	-990.462	-2272.465	-1231.368	-979.616	-2244.045	-377.379	-151.516	-542.458	-219.714	-59.685	-301.848
AIC	2532.651	2012.924	4576.929	2494.736	1991.233	4520.089	786.759	335.033	1116.816	471.428	151.371	635.697
/lnalpha	-0.0784	-0.0948	0.0146	-0.142	-0.107	-0.0140	-0.283	-0.876	-0.0644	0.174	-16.15	0.688***
	(0.089)	(0.115)	(0.069)	(0.091)	(0.116)	(0.071)	(0.207)	(0.558)	(0.168)	(0.327)	(1,168)	(0.230)
alpha	0.925	0.909	1.015	0.868	0.898	0.986	0.754	0.416	0.937	1.189	0.000	1.989
	(0.083)	(0.105)	(0.069)	(0.0793)	(0.105)	(0.069)	(0.156)	(0.232)	(0.157)	(0.389)	(0.000)	(0.457)

*** p<0.01.** p<0.05.* p<0.1.Standard errors in parentheses.

[a] SICI excluding artists

Source: Authors' calculations

Table 6. Location decision of bohemians (OLS)

Bohemian_density	(1) Metro	(2) Non_Metro	(3) Total
Art demand measures			
ppopuni	0.331	0.111	0.178
	(1.124)	(0.099)	(0.453)
income	0.184***	0.002	0.106***
	(0.034)	(0.005)	(0.0164)
pnonfamily	2.383	0.398***	0.498
	(1.493)	(0.141)	(0.615)
Community amenities			
foreign	1.248	-0.284	0.774
	(3.799)	(0.329)	(1.459)
gay_density	6.392***	1.183***	6.227***
	(0.398)	(0.287)	(0.266)
heritage	-0.003	0.000	-0.001
	(0.005)	(0.000)	(0.002)
Settlement			
pop_density	0.219**	1.675***	0.292***
	(0.108)	(0.051)	(0.071)
commuting	-0.858	-0.058	-0.036
	(0.914)	(0.149)	(0.480)
pop91-01	-0.728***	-0.088	-0.498***
	(0.270)	(0.074)	(0.163)
Constant	-1.542*	-0.165*	-0.895**
	(0.785)	(0.097)	(0.357)
N	420	526	946
R^2	0.800	0.841	0.794
Log likelihood	-912.710	-35.262	-1709.331

*** p<0.01.** p<0.05.* p<0.1.Standard errors in parentheses.
Source: Authors' calculations

Table 7. Location determinants of firms with '*creative milieu*' effect (ZINBM)

	All firms			Non-creative			Creative			Fashion		
Firm Entries	**(1) Metro**	**(2) Non_Metro**	**(3) Totals**	**(1) Metro**	**(2) Non_Metro**	**(3) Total**	**(1) Metro**	**(2) Non_Metro**	**(3) Total**	**(1)Metro**	**(2)Non_Metro**	**(3)Total**
ptech	0.494	5.689***	4.016***	0.491	5.803***	4.111***	0.513	-1.574	2.956	-4.829	-20.96**	-2.636
	(2.043)	(1.357)	(1.102)	(2.048)	(1.361)	(1.109)	(4.310)	(4.516)	(2.854)	(7.329)	(9.584)	(4.957)
puni	-2.009*	-2.250	-1.715**	-1.820*	-2.220	-1.611*	-3.871**	3.072	-2.876*	-0.812	18.91***	-0.0954
	(1.107)	(1.477)	(0.856)	(1.088)	(1.482)	(0.852)	(1.881)	(4.095)	(1.637)	(3.054)	(6.915)	(2.617)
job_den	0.198***	1.746***	0.323***	0.185**	1.711***	0.305***	0.191**	0.309	0.291***	0.330***	-0.215	0.365***
	(0.0766)	(0.497)	(0.0842)	(0.074)	(0.488)	(0.083)	(0.078)	(0.454)	(0.083)	(0.117)	(0.662)	(0.127)
job_pop	2.471*	7.784***	4.680***	2.207*	7.637***	4.457***	6.241	11.35**	9.191***	2.960	6.363	9.195
	(1.275)	(1.570)	(0.962)	(1.263)	(1.576)	(0.962)	(3.875)	(4.751)	(3.092)	(7.909)	(8.342)	(5.671)
job_ser	0.785	0.409	0.858***	0.701	0.374	0.818***	-0.296	0.916	0.394	-2.130	3.137	-0.710
	(0.507)	(0.343)	(0.290)	(0.506)	(0.343)	(0.292)	(1.073)	(1.125)	(0.786)	(1.773)	(2.528)	(1.300)
job_ind	5.622***	1.809**	3.907***	5.588***	1.763**	3.883***	4.580**	2.924	3.682***	3.767	3.865	3.443
	(1.001)	(0.728)	(0.595)	(0.986)	(0.729)	(0.594)	(1.865)	(1.903)	(1.305)	(3.261)	(3.478)	(2.204)
psmall	-1.253***	-1.050***	-1.379***	-1.293***	-1.055***	-1.367***	-0.743	0.401	-0.652	-1.221	-2.180	-1.135
	(0.369)	(0.317)	(0.245)	(0.363)	(0.316)	(0.244)	(0.659)	(0.848)	(0.518)	(1.115)	(1.552)	(0.876)
job_hk_ser	4.810***	1.208	3.246***	4.743***	1.199	3.204***	6.146***	4.453*	5.571***	7.215***	3.660	7.263***
	(1.019)	(0.855)	(0.706)	(0.999)	(0.851)	(0.700)	(1.731)	(2.608)	(1.409)	(2.762)	(4.481)	(2.213)
sici[b]	0.306*	0.137	0.347***	0.220	0.088	0.291**	1.182***	0.675***	0.815***	-	-	-
	(0.175)	(0.131)	(0.117)	(0.170)	(0.132)	(0.116)	(0.294)	(0.198)	(0.191)			
sici_fashion	-	-	-	-	-	-	-	-	-	0.607***	0.405***	0.406***
										(0.166)	(0.0819)	(0.0931)
creative_milieu	0.0288	-0.238	0.00985	0.027	-0.237	0.010	0.012	0.0137	0.009	0.0365	0.0577	0.0243
	(0.0330)	(0.258)	(0.0372)	(0.032)	(0.255)	(0.036)	(0.029)	(0.291)	(0.033)	(0.0421)	(0.448)	(0.0568)
dist_cappro	-0.00929**	-0.0103***	-0.0113***	-0.009**	-0.010***	-0.011***	-0.021**	-0.008	-0.015***	0.00486	-0.0202	-0.0127
	(0.00460)	(0.00261)	(0.00184)	(0.005)	(0.003)	(0.002)	(0.009)	(0.007)	(0.005)	(0.0156)	(0.0160)	(0.00832)
cap_com	0.702**	1.232***	0.946***	0.689**	1.217***	0.925***	0.569	0.641	0.679**	-0.153	-0.664	-0.0350
	(0.312)	(0.241)	(0.194)	(0.303)	(0.239)	(0.192)	(0.352)	(0.428)	(0.266)	(0.536)	(0.856)	(0.428)
seaside	0.700***	0.781***	0.729***	0.658***	0.773***	0.700***	0.853***	0.249	0.728***	0.774*	-0.866	1.094***
	(0.191)	(0.236)	(0.151)	(0.187)	(0.235)	(0.149)	(0.279)	(0.585)	(0.243)	(0.415)	(1.173)	(0.366)
constant	0.138	-2.234***	-0.986*	0.350	-2.167***	-0.885	-3.990*	-8.182***	-6.012***	-2.126	-5.116	-5.970**
	(0.845)	(0.818)	(0.555)	(0.830)	(0.820)	(0.555)	(2.194)	(2.600)	(1.642)	(3.803)	(3.736)	(2.730)
Inflated variables												
pop	-7.148***	-5.855***	-6.194***	-4.726***	-5.665***	-5.188***	-0.669***	-3.291***	-1.618***	-0.332***	-3.957***	-1.440***
	(2.142)	(1.378)	(1.114)	(1.122)	(1.335)	(0.954)	(0.240)	(0.913)	(0.455)	(0.106)	(1.494)	(0.549)
constant	2.358***	1.436***	1.704***	1.786***	1.397***	1.501***	1.833***	4.417***	2.800***	1.988***	6.418***	2.858***
	(0.633)	(0.386)	(0.320)	(0.437)	(0.379)	(0.295)	(0.494)	(0.938)	(0.524)	(0.472)	(1.960)	(0.745)
Vuong Test	5.05***	3.82***	5.85***	5.26***	3.81***	5.93***	3.70***	3.59***	5.29***	2.71**	1.73**	3.52***
N	420	526	946	420	526	946	420	526	946	420	526	946
Non zero obs.	319	299	618	315	298	613	122	52	174	62	22	84
LR X^2	316.80	243.87	643.48	301.45	235.71	613.16	161.49	63.90	239.80	86.22	63.27	129.77
Log likelihood	-1249.929	-990.055	-2272.429	-1230.978	-979.204	-2244.004	-377.294	-151.515	-542.421	-219.327	-59.677	-301.753
AIC	2533.859	2014.11	4578.858	2495.956	1992.408	4522.008	788.589	337.030	1118.841	472.654	153.354	637.507
/lnalpha	-0.0807	-0.101	0.0144	-0.144	-0.112	-0.0142	-0.287	-0.880	-0.0681	0.151	-17.44	0.685***
	(0.0898)	(0.116)	(0.0685)	(0.091)	(0.117)	(0.071)	(0.208)	(0.565)	(0.169)	(0.328)	(1,605)	(0.229)
alpha	0.922	0.904	1.015	0.866	0.894	0.986	0.751	0.415	0.934	1.163	0.000	1.985
	(0.083)	(0.104)	(0.069)	(0.079)	(0.104)	(0.069)	(0.156)	(0.234)	(0.157)	(0.381)	(0.000)	(0.455)

*** p<0.01.** p<0.05.* p<0.1.Standard errors in parentheses. [b] SICI excluding artists. Source: Authors' calculations

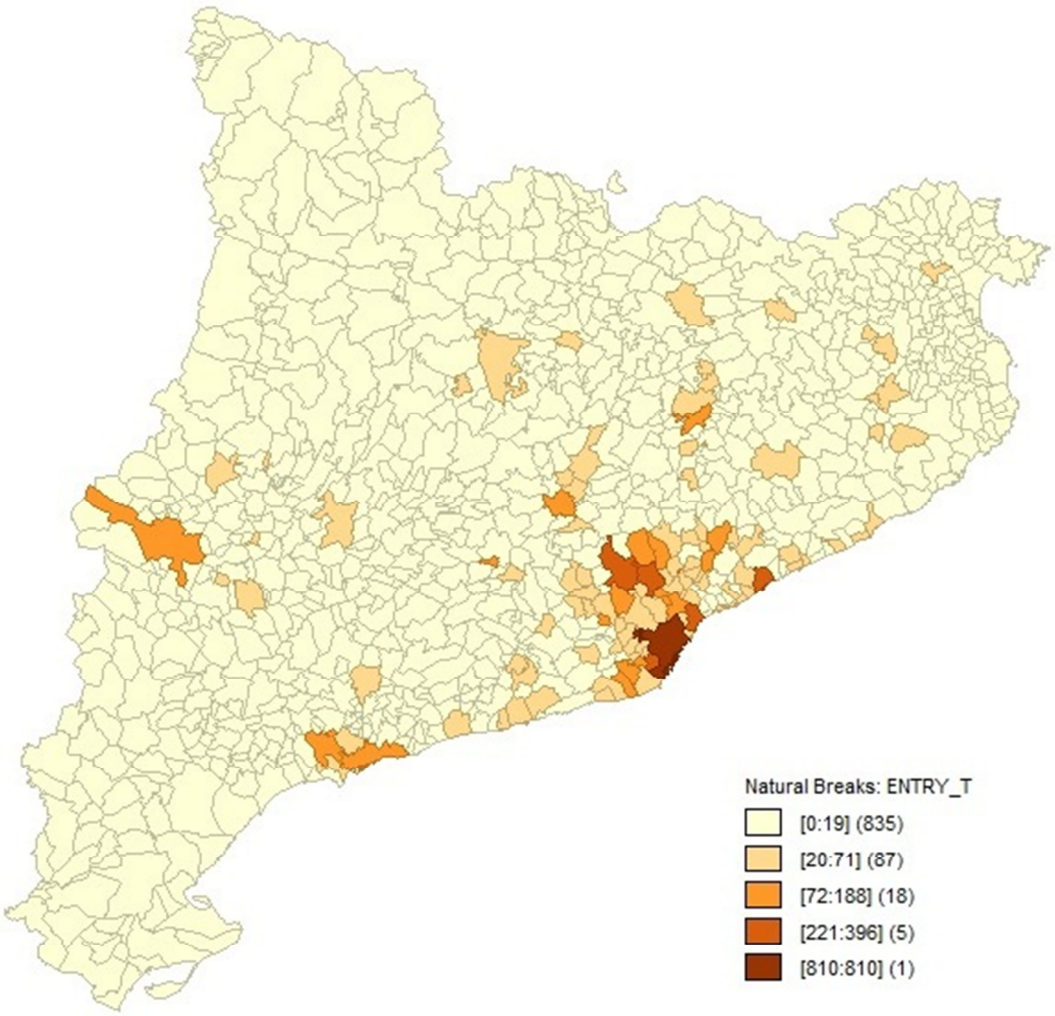
Table 8. Location determinants of firms including spatial dependence (ZINBM)

Entries	(1) All firms	(2) Non_crea	(3) Creative	(4) Fashion
ptech	2.759**	2.793**	1.333	-6.340
	(1.091)	(1.101)	(3.081)	(5.325)
puni	-4.424***	-4.339***	-5.481***	-3.960
	(0.843)	(0.842)	(1.615)	(2.544)
job_den	0.055	0.037	0.148*	0.232**
	(0.068)	(0.067)	(0.076)	(0.113)
job_pop	3.256***	3.048***	6.437**	7.467
	(0.977)	(0.979)	(3.152)	(5.608)
job_ser	0.233	0.200	-0.035	-1.054
	(0.275)	(0.276)	(0.756)	(1.274)
job_ind	0.589	0.522	0.623	0.896
	(0.658)	(0.660)	(1.497)	(2.542)
psmall	-1.156***	-1.150***	-0.662	-1.498*
	(0.228)	(0.227)	(0.498)	(0.843)
job_hk_ser	3.278***	3.270***	4.587***	5.699***
	(0.625)	(0.623)	(1.301)	(2.007)
sici [c]	0.174*	0.130	0.667***	-
	(0.099)	(0.098)	(0.171)	
sici_fashion	-	-	-	0.355***
				(0.080)
creative_milieu	0.013	0.011	0.036	0.072
	(0.028)	(0.028)	(0.029)	(0.046)
dist_cappro	-0.012***	-0.012***	-0.017***	-0.018*
	(0.002)	(0.002)	(0.006)	(0.01)
cap_com	1.461***	1.442***	1.246***	0.433
	(0.184)	(0.183)	(0.280)	(0.423)
seaside	0.751***	0.731***	0.577**	0.802**
	(0.152)	(0.151)	(0.260)	(0.376)
w_ptech	11.55	12.42	52.10*	104.8*
	(10.31)	(10.32)	(28.33)	(54.70)
w_puni	33.29*	32.19*	36.07	-86.05
	(17.05)	(17.02)	(42.40)	(71.26)
w_job_den	-0.254	-0.266	-0.702	-0.566
	(0.287)	(0.287)	(0.685)	(1.124)
w_job_pop	24.03*	24.52*	65.12*	152.2***
	(14.23)	(14.20)	(34.49)	(57.17)
w_job_ser	-5.918	-5.564	-19.44	4.942
	(5.219)	(5.203)	(12.59)	(21.71)
w_job_ind	-1.480	-1.361	-15.39	-60.05**
	(7.145)	(7.144)	(16.74)	(25.67)
w_psmall	14.69***	14.92***	22.79*	-15.19
	(5.560)	(5.576)	(12.84)	(23.30)
w_job_hk_ser	2.134	2.235	21.80	-26.80
	(12.74)	(12.76)	(31.65)	(55.69)
w_sici	4.898***	4.960***	4.019	-
	(1.269)	(1.268)	(2.675)	
w_sici_fashion	-	-	-	3.207**
				(1.616)
w_creative_milieu	0.957	0.648	5.818*	13.27**
	(1.341)	(1.338)	(3.180)	(5.504)
constant	-28.49***	-28.96***	-55.73**	-49.87
	(9.410)	(9.437)	(22.32)	(39.68)
Inflated variables				
pop	-6.653***	-5.781***	-1.758***	-1.461***
	(1.131)	(1.018)	(0.524)	(0.562)
constant	1.841***	1.664***	2.705***	2.644***
	(0.322)	(0.304)	(0.558)	(0.768)
Vuong Test	5.95***	6.02***	4.44***	2.85**
N	946	946	946	946
Non zero observations	618	613	174	84
LR X^2	769.41	737.45	285.65	164.33
Log likelihood	-2209.464	-2181.861	-519.495	-284.474
AIC	4472.928	4417.722	1092.99	622.949
/lnalpha	-0.200***	-0.221***	-0.411**	0.157
	(0.072)	(0.074)	(0.191)	(0.286)
alpha	0.819	0.802	0.663	1.171
	(0.059)	(0.059)	(0.127)	0.335

*** p<0.01.** p<0.05.* p<0.1.Standard errors in parentheses. [c] SICI excluding artists Source: Authors' calculations

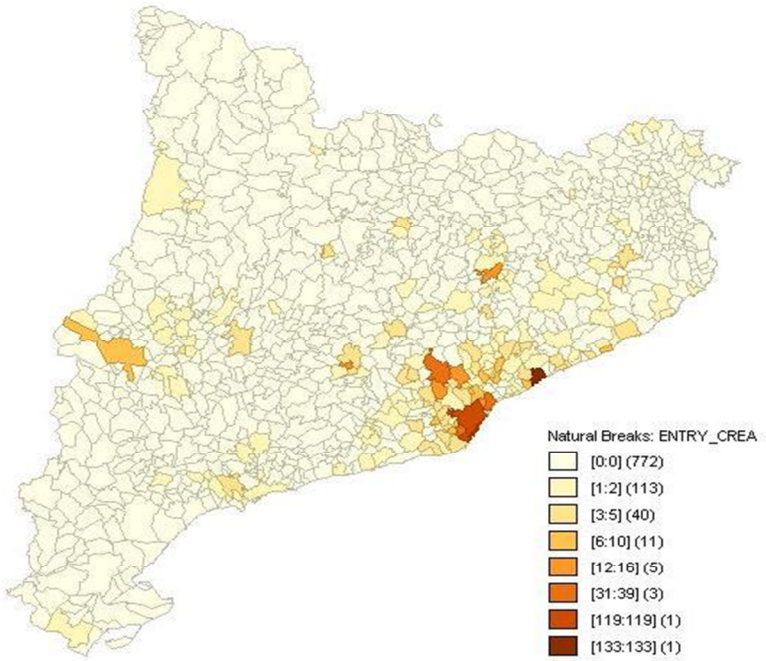
Figures

Figure 1. Spatial distribution of new plants (2002-2007)

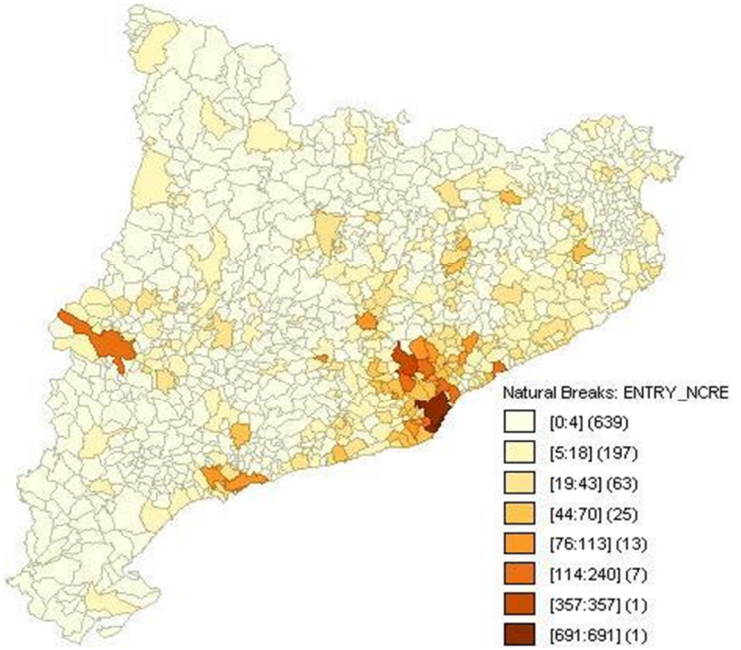


Source: Authors' calculations with data from REIC.

Figure 2. Spatial distribution of new plants (2002-2007) by creative and non-CI's



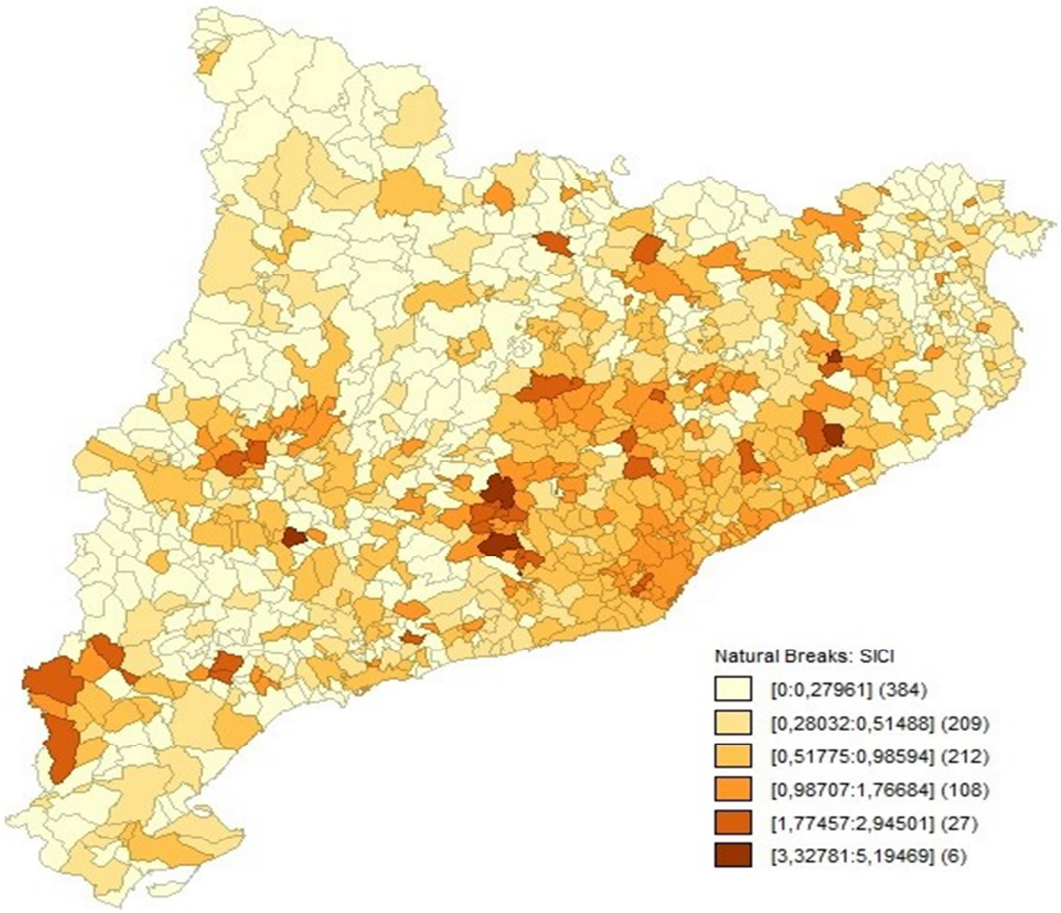
Entries of Creative Firms



Entries of Non-Creative Firms

Source: Authors' calculations with data from REIC.

Figure 3. Spatial distribution of Specialisation Index in Creative Industries



Source: Authors' calculations with data from 2001 Census.