

Cultural and Creative Industries and Employment Growth in Urban and Rural Catalonia

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Abstract

Despite the acknowledgement of the role of Cultural and Creative Industries (CCIs) in European policy frameworks, there is limited research on their association with local employment growth outside metropolitan areas. Using municipal-level employment data from Catalonia, we explore this relationship, differentiating between urban /intermediate / rural settings and accounting for spatial dynamics likely to occur on a regional level. Our findings suggest that specialization in CCIs is positively associated with employment growth in most sectors, but only for rural areas. We also highlight differences among production-oriented activities, producer, and consumer services. Tailored economic development strategies are thus needed, considering specific industries and municipalities.

Keywords: creative industries, employment growth, cities, Catalonia.

JEL codes: C10, R12, R58, Z10

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Acknowledgements

This research was partly funded by the Martí i Franquès COFUND (European Commission, Horizon 2020), FEDER/Ministerio de Ciencia, Innovación y Universidades (ECO2017-88888-P), the “Xarxa de Referència XREPP” and the SGR Program (SGR2021-00729) of the Catalan Government.

Disclosure statement

No potential conflict of interest was reported by the authors.

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1. Introduction

Do cultural and creative industries (CCIs) fulfill a role as drivers of economic growth? Economists and policymakers are increasingly interested in finding *hard* evidence explaining the dynamics of these industries. The prevailing arguments in contemporary literature suggest that CCIs play a significant role in fostering local innovation and dynamism (Boix *et al.*, 2016), providing creative skills with robust “forward” and “backward” linkages in the economy (OECD, 2022), and enhancing resilience in a post-crisis environment (OECD, 2018; UNCTAD, 2010). CCIs are also found essential for urban development and job creation (Stam *et al.*, 2008), particularly in regional development (Susiú *et al.*, 2018). These industries have transitioned from a peripheral role to a more prominent place in the development priorities of the European Union, OECD, and UN agencies. A more theoretical debate in literature addresses whether local employment growth is boosted by specialization or diversity between and within sectors, considering possible positive externalities and spatial spillovers. Higgs and Cunningham (2008) emphasized the need to precisely assess the impact of CCIs concentration on economic activity to assist policymakers in leveraging the economic and social impacts of CCIs in efforts to contribute to transforming local economies. Combes and Gobillon (2015) have positively linked the presence of local human capital to total employment growth. There is also empirical evidence demonstrating the positive effect of the increase in the number of firms in the creative industries on regional economic growth, underscoring the importance of studying the relationship between CCIs and employment growth at the local level (Piergiorganni *et al.*, 2012).

Still, this relationship is yet to be explored. There is a lack of research regarding interactions between different sectors to promote local and regional development, specifically focusing on how CCIs contribute to creating local job opportunities. Moreover, existing literature shows a clear preference for metropolitan and urban areas, neglecting intermediate and smaller rural regions. This study seeks to address this gap within the Catalan setting. In the context of CCIs economic activities, this paper also considers a new categorization of CCIs into three subgroups: production-oriented activities, producer-services, and consumer-services, to explore the collective role of different CCIs subsectors in the local economy and their direct and spatial spillovers.

Despite growing efforts to establish a widely accepted classification of CCIs, heterogeneities are still important. Creative industries were initially defined as “those which have their origin in individual creativity, skill, and talent and which have the potential for wealth and job creation through the generation and exploitation of intellectual property” (DCMS, 2001, p.4). Generally speaking, most definitions follow the structure provided by the UK DCMS model (2001) and then those from the OECD (2007), UNCTAD (2008), and the European Commission (2012), but controversies still persist. Bakhshi *et al.* (2013), for example, criticized the DCMS model and called for the inclusion of a major creative sector in the shape of software design, while Lazzeretti *et al.* (2008) and Coll-Martínez and Arauzo-Carod (2017) further developed it. Nevertheless, as there is already an ongoing debate it is necessary to try to adapt previous studies and policy-oriented reports to the nature of the specific contexts and the intensity of creative occupations in certain industries. Consequently, and having analyzed the pros and cons of alternative classifications, in this paper, we have opted for a broad approach to CCIs and we have considered the following activities²: fashion, publishing, graphic arts, printing, jewelry, musical instruments, toys, software, videogames, research and development, architecture and engineering, advertising, photography, design, cinema, video, music, TV, radio, writers, performing arts, visual arts, crafts, and heritage-

related activities. We then categorize these activities into the previous three groups: production-oriented activities, producer-services, and consumer-services.

The main point of this paper relies on the discussion of the key role that CCIs can play in local employment growth for different profiles of municipalities. This view contrasts with most of empirical literature that has focused on urban areas (ignoring the potential effects of CCIs in rural environments) and justifies gathering additional empirical evidence for non-urban municipalities (i.e., smaller and peripheral ones) to identify specificities of local growth mechanisms and to better tailor public policies concerning CCIs. In this sense, the contribution of this paper to the ongoing discussion is threefold. First, we investigate the relationship between specialization¹ in CCIs and overall employment growth and the employment growth of four sectors separately (agriculture, manufacturing, construction, and services), at the municipality level in Catalonia. The relationship between CCIs and other sectors is yet to be further explored in literature. Several studies argue that the agglomeration of CCIs can have a positive spill-over effect on other sectors of the economy. We try to explore this at a local level, focusing on employment. Analyzing the Catalan case is of interest not only due to the lack of similar contributions but also because of its geographical and economic structure (small and compact enough to allow close interactions across different regions) and the sizeable share of CCIs in terms of employment and GDP. Secondly, we investigate whether the effects of local specialization in CCIs are the same across territories and sectors to identify whether there are spatial/sectorial specificities that may intensify/decrease the positive effects of these industries. This study introduces a spatial approach to the analysis of CCIs, diverging from the empirical literature's predominant focus on large metropolitan areas without considering spatial dependence. Thirdly, the role played by categorized subgroups of CCIs also receives attention in this paper to explore the existence of heterogeneity in their economic impacts. In this respect, the main contribution of this paper comes from the identification of the dynamic employment role played by small (rural) municipalities specialized in CCIs and a specific analysis at the CCI industry level. Our findings contrast with previous ones that solely identify big urban areas as places where CCIs play a significant role in terms of employment and do not identify in a precise way which CCIs have a stronger capacity to boost employment in general terms. Exploring urban/intermediate/rural and subgroup differences is essential for informing regional economic development policies targeting CCIs and employment growth.

The structure of the paper is as follows. Section 2 reviews the literature, addresses the main points raised by scholars, and discusses agglomeration externalities and their effect on local growth, while section 3 details the characteristics of the dataset, defines CCIs, describes the variables, and provides some descriptive statistics. Section 4 describes the econometric strategy and discusses the main results, and Section 5 concludes and suggests directions for further research.

2. CCIs as Drivers of Economic Growth

CCIs are one of the main contributors to the economy in developed countries (Higgs and Cunningham, 2008). Their impact on economic growth has attracted considerable attention among

¹ We acknowledge that for a relative measure like specialization size matters, as for small municipalities minor changes in absolute numbers may have important effects in relative terms, but this is a limitation common to other papers using that measure (e.g., Koster et al., 2020; Innocenti and Lazzeretti, 2019; Piergiovanni et al., 2012).

economists and policymakers, indicating governments' desire to exploit cultural and creative production to foster employment and economic growth (Kourtiti and Nijkamp, 2019). According to the European Commission (2016), CCIs employ, directly and indirectly, 15 million people, which accounts for 7.5% of the EU's workforce, thus making those sectors the 3rd largest employer in the EU. These figures place CCIs ahead of other industries in the EU, as they employ 2.5 times more people than automotive manufacturers and 5 times more than the chemical industry, in addition to enhancing the quality of life (European Parliament, 2016). These potentialities of CCIs arise especially from their creative side and their role in economic development (Gouvea and Vora, 2018), the higher spending on intangibles in CCIs and their stronger growth capacity compared to other industries, as demonstrated, for instance, by Scheffell and Thomas (2011) for the UK. The prevailing arguments among researchers on the potential impact of CCIs on economic growth are interrelated and can be grouped into the following ones:

i) CCIs are integral parts of local development: Creative industries play a significant role in both the social and economic development of local economies (OECD, 2018) and nations (UNCTAD, 2010).

ii) The creative class: Florida (2004) argues that the creative class is a major driver of urban and regional growth, but this claim is subject to much criticism, mainly concerning the lack of clear empirical evidence, in addition to causality concerns.

iii) The contribution of CCIs to innovation activities: CCIs are innovative in themselves and contribute to innovation in other sectors (Bakhshi *et al.*, 2013).

iv) Clustering, positive consumption, and production externalities: There are positive externalities resulting from clustering. This translates into the expansion and growth of cultural and creative areas, the easy exchange of ideas and spillovers to other sectors, and the boosting of entrepreneurial activities. Nevertheless, clustering patterns are specific to each one of the groups of CCIs considered in this paper (i.e., production-oriented activities, producer-services and consumer-services) as some of them generate mainly supply-side agglomeration (e.g., production-oriented activities that imply manufacturing tasks), others generate mainly demand-side agglomeration (e.g., consumer services with live activities), and others may generate both types of agglomeration (e.g., digital producer services and consumer services such as heritage-related activities and performing arts).

v) Employment growth: CCIs play a relevant role in generating employment and enhancing well-being (Kemeny *et al.*, 2020). In this respect, because studies over the last decade have had mixed findings, the economic implications of these industries need to be properly measured. Stam *et al.* (2008) find that firms in creative industries located in urban areas are more innovative than their rural counterparts and that (except for Amsterdam) there is no spillover effect of any great size from creative industries. Other findings regarding the contribution of CCIs reveal that an increase in the number of firms active in the creative industries has a positive effect on regional employment growth (Piergiovanni *et al.*, 2012). Mossig (2011) investigates CCIs in Germany and finds that they have a more significant effect on employment growth in urban areas and that rural areas cannot benefit from the growth in CCIs. On the contrary, Lazzeretti *et al.* (2017), for Italy, find that although CCIs have a positive effect in terms of employment in the creative sector, there is a

lack of impact on the overall economy. Previous results highlight the huge asymmetries of CCIs when differentiating between urban/rural areas. Additionally, Gutierrez-Posada *et al.* (2021) consider whether CCIs generate multipliers using a long-term panel for UK cities, and find large, significant, and positive multiplier effects of creative industries jobs on surrounding local service employment. CCIs can foster intra- and inter-industry knowledge spillover, mainly driven by their creative human capital that can be expected to contribute to the outputs of other sectors (Audretsch and Belitski, 2013). This study thus builds upon the argument that economic sectors with high levels of innovation can have multiplier effects on productivity, job creation, and firms' innovation within the local economy.

Empirical evidence shows that CCIs tend to cluster and that these agglomerations positively impact regional growth of total factor productivity (Hong *et al.*, 2014), and that most of the regions in the top highest CCIs growth regions are small and medium-sized (Power and Nielses, 2010). Nevertheless, there is also evidence showing that CCIs' clusterisation not always occur inside big urban (central) areas but, on the contrary, also in small (peripheral) ones, as Maddah *et al.* (2023) show for Catalonia concerning several industries. Location patterns of these creative activities out of main cores (Bain, 2016) can be explained thanks to suburbanization processes, trying to avoid negative externalities of main urban cores but without locating too far from them and to benefit from advantages of less congested areas (Polèse *et al.*, 2007).

MAR Versus Jacob's Externalities: drivers of local employment growth

To contribute to the preceding literature, the theoretical framework for our empirical analysis is an adaptation of the approach of Glaeser *et al.* (1992) commonly used by many similar studies, such as Eriksson *et al.* (2017) and Bishop and Gripaios (2009) about urbanization and localization (Jacobs' type) economies. The main study that empirically assessed the effects of MAR v. Jacobs' externalities was that by Glaeser *et al.* (1992), which was then followed by a wide range of studies that had mixed findings, such as Henderson *et al.* (1995). Even if some of the previous results might be considered contradictory, this is not true if it is assumed that knowledge generation and transmission vary across industries and, therefore, the effects of spatial agglomeration may also depend on industries and spatial areas considered.²

Firm growth in rural areas

Mechanisms concerning the potential impact of CCIs on economic growth apply not only for urban areas, but also for rural ones although with some differences with urban processes. In this sense, employment growth is driven by various contextual factors. Labor market analyses have generally disregarded territorial dimensions, as conventional wisdom supposes that cities flourish, and rural areas lag behind. Yet, recent evidence has highlighted the growth capacity of rural regions (OECD, 2015). This differentiation is particularly important given the recent challenges for policymakers to diversify or specialize rural areas (Koster *et al.*, 2020). For Spain specifically, Holl (2017) emphasized the role of local sectoral composition in local growth differences and found that, while urban municipalities performed better than rural ones during the recession, rural municipalities featured higher employment growth during the recovery. Additionally, within rural contexts,

² Chung and Hewings (2019) show differences reported when the analysis is conducted using US state level data or when using US county level data.

knowledge embeddedness can be less frequent, and firms face less demand for their products and services as compared to cities. Common factors that influence firm growth in rural areas include the social capital, specific natural and cultural values of the local system, the development of non-agricultural activities and networks that facilitate innovation and its absorption (product-related, technological, or organizational), and infrastructural amenities. This is a quite relevant dimension, as relative stock of social capital is much higher in small (rural) areas and CCIs dynamism is considerably fed by that social capital, and interactions across firms (especially among self-employees, quite common firm structure for CCIs) are much higher in these industries than for other economic activities (Mazzoni *et al.*, 2022).

Limited access to larger markets and financial resources, and less diversification are factors that lower the average firm growth in rural areas relative to urban settings (Backman, 2013). An interesting finding in literature regards the importance of the level of firm linkage, what the local community can offer, and the reliance on resources and knowledge that can be facilitated and accessed, high dependency on local human capital, social local anchoring, and local embeddedness may become more relevant for the exploitation of growth opportunities (Meccheri and Pelloni, 2006).

The presented literature covers the role of CCIs in local development, and the drivers of employment growth at a local level, considering the role of different profile of municipalities (i.e., urban, intermediate and rural). We look at these patterns in Catalonia by examining the capacity of these knowledge-based sectors, arguing that locational productivity variances may owe something to the advantages that creative industries generate at the local level. Accordingly, we put forward the following hypotheses:

Hypothesis 1 Specialization in CCIs is positively associated with total employment growth in Catalan municipalities and its effect varies at sectoral level.

Hypothesis 2 The impact of specialization in CCIs on employment growth differs between urban, intermediate and rural areas of Catalonia.

3. Methodology and data

The data in this paper refer to municipalities³ in Catalonia⁴, an autonomous region in north-eastern Spain whose capital is Barcelona, the second largest city in Spain and a major cultural center for some CCIs, especially heritage, music, architecture, design and videogames. Catalan municipalities are quite heterogeneous in terms of population, employment, and urbanization, as they range from just a dozen of inhabitants till 1,5 million (Barcelona). Based on our data for Catalonia, a significant portion of the municipal landscape comprises small municipalities. Approximately 81.5% of the overall municipal count (768 out of 942 municipalities) are rural (i.e., those below 5,000 inhabitants), 13.0% are intermediate (122; from 5,000 up to 19,999 inhabitants), while the remaining 5.5% (52) are urban (i.e., from 20,000 inhabitants). Across the four Catalan provinces, Lleida has the biggest proportion (85% of its municipalities are rural), followed by Girona and

³ The current number of Catalan municipalities is 948, but we omitted 6 of them due to lack of data.

⁴ Catalonia has about 7.5 million inhabitants (15 per cent of Spain's population), covers an area of 31,895 km², accounts for 19 per cent of Spanish GDP, and hosts a significant share of CCIs activities.

Tarragona. Remarkably, approximately 45% of the municipalities in the province of Barcelona have fewer than 5,000 residents. As for CCIs employment, in 2001, CCIs accounted for around 9.5% of Catalonia’s total employment (roughly 249,701 jobs). In rural areas, CCIs’ share is around 7.5% of total employment, with varying degrees of specialization among municipalities.

The local spatial scale used in this paper has been selected to capture various patterns in the association between CCIs specialization and employment growth (both for urban, intermediate and rural municipalities), given the variability in municipalities⁵. The dependent variables measure total local employment growth (in logs) between 2001 and 2011, as well as local employment growth for agriculture, manufacturing, construction, and services. Recent work emphasizes that CCIs have positive spillover potential that extends beyond their own sectors and may influence innovation and growth in other sectors (Santoro *et al.*, 2020). The independent variables are specific local characteristics (measured in 2001) hypothesized to explain that process. In choosing these variables, prior studies’ variables (see Table 1), data availability, and data characteristics have been considered.

[INSERT TABLE 1]

Data from various sources were used in this study (see Table 2): the employment data were obtained from the IDESCAT (Catalan Statistical Institute), the Social Security Register and the Census of Population and Housing for 2001 and 2011 from the INE (Spanish Statistical Institute).

[INSERT TABLE 2]

We aim to estimate the change in local employment as a function of specific local characteristics described below (as well as spatially weighted factors):

$$Y = \beta X + \varepsilon$$

where Y is the dependent variable (employment growth), X is a matrix containing all independent variables plus an intercept, and ε is the error term. As the main covariate has some degree of spatial dependence that requires the inclusion of spatial lagged variables, since the assumption of non-dependence between cross-sectional observations is presumably not satisfied.

To account for the spatial dependence of specialization in CCIs we need to define the spatial range of the existing interactions among municipalities. In this regard, we use a row-standardized spatial-neighbor matrix (W).⁶ Among the various approaches that can be used (distance-based neighbors or k -nearest neighbors, among others) we assume a contiguity criterion, but our results were quite robust with regard to alternative formulations of W matrices.⁷ Once W is identified, we calculate the spatial lagged LQCCIs, and then the spatial lagged variable for each LQ categorization (i.e., *WLQ-Production oriented activities*, *WLQ-Producer services*, and *WLQ-Consumer services*)

⁵ See Maddah *et al.* (2023) for an analysis about clustering of CCIs in the metropolitan region of Barcelona and Coll-Martínez and Arauzo-Carod (2017) for an overview of entry of CCIs firms in Catalonia.

⁶ Using both highly disaggregate spatial units, lagged covariates and spatial lagged variables helps to tackle potential endogeneity problems.

⁷ Queen contiguity weight matrix was also tested.

Formally, for observation i , the spatial lag of x_i , referred to as $[Wx]_i$ (variable Wx observed for location i) is:

$$[Wx]_i = w_{i1}x_1 + w_{i2}x_2 + \dots + w_{in}x_n$$

$$[Wx]_i = \sum_{j=1}^n W_{ij}x_j$$

where W_{ij} consists of the elements of the i -th row of matrix W , matched with the corresponding elements of vector x .

As we assume that specialization in creative industries is a key driver of employment growth, we will first focus our analysis on several indicators of that specialization. For agglomeration economies and sector specialization, we use the *Location Quotient* of CCIs (*LQCCIs*) and its spatial lagged version (*WLQCCIs*). Hence, we try to capture the spatial spillover effects (Chung and Hewings, 2019) as the effect of LQ is not constrained at the same municipality and goes beyond these administrative borders affecting neighbor areas. The approach by Glaeser *et al.* (1992) and Henderson *et al.* (1995) was recently revisited by Fracasso and Vittucci Marzetti (2018). In this sense, population density provides a proxy for the degree of urbanization and may be relevant for some activities requiring a high degree of potential interactions. Transport infrastructures are proxied using the mean travelling time to the own provincial capital (*Infracap*). We have decided to use province level as traditionally this is the relevant public administration level (i.e., province capitals) where most of public services locate. In this sense, proximity to administrative and economic cores is needed to access the higher-level services provided there (Guimarães *et al.*, 2000) and because the main markets tend to be there. Human capital is proxied through the percentage of workers holding university degrees (*University*), although human capital requirements vary across industries, skilled workforce is required for all types of economic activities. Finally, market structures are proxied by an entropy index (*Entropy*) and the percentage of workforce in firms with up to 50 employees (*Smallfirms*). The entropy index makes it possible to identify whether a municipality is homogeneous or diverse in terms of its sectoral structure (the higher the value of the index, the greater the diversity), to identify whether diversification or specialization drives growth at local level. Firms' structure in terms of size also matters because areas in which SMEs predominate are more likely to favor start-ups creation and employment growth (Arauzo-Carod, 2008). The correlation matrix (see Table A.2) shows that there are no major problems among variables⁸.

Figure 1 shows the spatial distribution of employment both in CCIs and in all activities; it is clearly agglomerated around the metropolitan area of Barcelona and in some other major urban areas, as is all economic activity.

[INSERT FIGURES 1-2]

Figure 2 shows the weight of CCIs at the local level in terms of employment and the CCI location quotients (LQ) calculated in relation to employment in Catalonia. This provides a broad overview of the location patterns of employment in CCIs.

⁸ Independent variables with high significant correlation have been removed from the model.

[INSERT FIGURE 3]

Figure 3 shows municipalities with location quotients larger than 1 for three categories of CCIs that have been considered to reflect the diverse nature of their contributions to the economy and the heterogeneity of their location patterns, in view of their structural differences and their different requirements in terms of supply and demand. The first group encompasses production-oriented activities, primarily manufacturing sectors with a creative edge, such as fashion manufacturing, jewelry, musical instruments, toys, graphic arts and printing, and publishing. These industries combine the art of design with the mechanics of production to create culturally significant products. The second group comprises producer services, which operate on a business-to-business model, including but not limited to advertising, architecture, design, software consultancy, and more specialized fields like R&D. These services are essential in supporting and enhancing the business operations of other sectors. The third group is consumer services (writers, cinema, music, arts venues, performing arts, visual arts and crafts, and heritage-related activities, such as libraries, museums, historical sites, and nature reserves), which are directly provided to the end consumer for cultural enrichment and entertainment. These services are integral in preserving and promoting cultural heritage. It is important to note that some activities may have elements of more than one category, considering the nature of their outputs and delivery can vary. However, these activities' primary focus and purpose can be used to classify them into the previous categories. Overall, maps in Figure 3 show the existence of several sub-centres corresponding mainly to county capitals (Catalonia is divided into 41 counties), and the existence of differences in industry specialization in CCIs, as this is stronger in the metropolitan area of Barcelona and in Camp de Tarragona region for consumer services, whilst production oriented activities are stronger in medium-sized inland municipalities and spatial asymmetries are much lower for producer services.

4. Econometric Strategy and Main Results

The econometric strategy intends to tackle urban, intermediate and rural effects of CCIs and consists of three stages: firstly, a baseline OLS model is estimated separately for all municipalities, urban municipalities (from 20,000 inhabitants), intermediate municipalities (from 5,000 up to 19,999 inhabitants), and rural municipalities (below 5,000 inhabitants); secondly, a quantile regression (QR) model focusing on sectoral Location Quotient (LQ)⁹, instead of overall LQ is estimated; and thirdly, a QR model and an interquantile (IQR) model for general CCI specialization are estimated.¹⁰

The analysis of employment growth shows very different patterns (see Table 3), with small municipalities (especially those below 1,000 inhabitants) showing immense employment dynamism in relative terms. At the same time, changes, albeit positive, are much smaller for larger municipalities, such as those with from 20,000-50,000 inhabitants, those with from 100,000-1,000,000 inhabitants, and the city of Barcelona. Nevertheless, the pattern is not linear in terms of

⁹ $LQ_i = \left(\frac{e_i}{e}\right) / \left(\frac{E_i}{E}\right)$ where e_i = Local employment in industry i ; e = Total local employment;

E_i = Regional employment in industry i ; and E = Total regional employment.

¹⁰ The variance inflation factor was measured to check for multicollinearity and all scores for the models and variables were below 1.25.

lower growth rates when the population increases, so there are obviously additional factors at work that help to explain this asymmetric behavior but, in any case, the empirical evidence provided supports considering urban, intermediate and rural municipalities.

[INSERT TABLE 3]

The heavy-tailed shape of employment growth distribution has numerous consequences for the estimation strategy. At a local level, the exploratory analysis confirms that the distribution of employment growth in Catalonia does not exhibit normal distribution characteristics. Small municipalities show immense employment dynamism in relative terms, while this is not the case for larger municipalities, and Barcelona specifically, which has the lion's share of total employment in Catalonia. To this end, quantile regression is deemed suitable in interpreting employment growth at a local level as it allows us to disentangle the effects of the explanatory variables on different parts of employment growth distribution. Thus, for example, specialization in CCIs can be examined for municipalities in the upper 10% of the employment growth range.

An initial strategy used to control for these heterogeneities is to separately regress all municipalities, urban ones, intermediate ones, and rural ones. At this point, it is important to correctly identify the profile of those municipalities considered as urban, intermediate or rural (see Table A.3.). Concretely, urban and intermediate ones have lower employment growth rates between 2001 and 2011 (1.2 and 1.2 vs 1.5) and higher specialization in CCIs (a LQ of 0.9 and 0.8 vs 0.6). Size is quite important in terms of explaining employment growth in relative terms because it is easier to achieve high growth rates when starting from very low levels, however, rurality can impose several challenges.

[INSERT FIGURE 4]

Figure 4 shows that rural municipalities are mainly inland and spread all over Catalonia, but all of them are far in distance from metropolitan Barcelona and other major urban areas. These rural municipalities correspond to “low-density areas” and have restricted access to the main services. This geographical remoteness limits the potential growth of these areas, making it more difficult to benefit from the agglomeration economies generated in the main urban areas, but at the same time, this makes production costs lower, enhancing the growth potential.

4.1 Main results

Table 4 shows the results of the baseline Ordinary Least Squares (OLS) regression focusing on the relationship between the degree of local specialization in CCIs (*LQCCIs*), its spatially lagged variable (*WLQCCIs*), and local employment growth across different sectors from 2001 to 2011. Overall, the level of R^2 is between low and moderate (although it varies considerably across industries), so our conclusions need to be taken with care. The first model suggests that when all municipalities in Catalonia are included, a higher degree of specialization in CCIs is associated with higher employment growth at the local level, as shown by the positive and significant coefficient of *LQCCIs*, which is maintained for Agriculture and Construction, being that for Manufacturing is negative and for Services is non-significant. What is noticeable is that when considering the total employment model, the global positive effect of *LQCCIs* exists only for rural

municipalities, whilst for urban ones is negative and for intermediates ones is non-significant. That result suggests that specialization in CCIs in urban areas is not having a positive effect (in terms of employment) but even a negative one. This might be attributed to higher competition or saturation of the job market in these industries within metropolitan settings. This finding supports Lee's (2014) study in the UK, indicating that creative industries stimulate job development in many sectors. However, in urban regions alone, CCIs do not lead to increased employment. Nevertheless, it is essential to note the difference in geographical scales between Lee (2014) and our study, as Lee (2014) uses travel-to-work-regions that are far bigger than those used in this paper. In rural municipalities, the positive coefficient of *LQCCIs* and its higher significance level suggest that the presence of CCIs has a more robust and positive association with employment growth when considering all industries, as when estimating different regressions for each one of them the positive effect is only for Agriculture and Construction. This can be explained by recent literature that discusses locational benefits that characterize rural areas, ranging from providing a better social climate (Alfken *et al.*, 2014) and CCI environment than major cities and facilitating local knowledge embeddedness strongly associated with job creation (McGranahan *et al.*, 2010). In this regard, we might advance the idea of certain thresholds above which CCIs, and perhaps their co-agglomeration patterns, are positively associated with job creation, possibly due to these industries' innovative nature and economic vitality. Our findings fit with those of Piergiovanni *et al.* (2012), who identified an overall favorable impact on regional job development in Italy. Still, these results align with previous studies by Lazzeretti *et al.* (2017) on Italy, Sörvik *et al.* (2019) on less populated and remote areas, and Lee (2014) on the UK, all of which highlight the specific industries and regions for which CCIs have positive effects. Nevertheless, it is important to interpret our results with caution when comparing them to those of other geographical areas, in view of their specificities.

[INSERT TABLE 4]

The spatially lagged variable *WLQCCIs* represents the spillover effects of CCIs from adjacent municipalities. It is a common way to model spatial dependency in regional analysis, where the assumption is that a given municipality is likely to be affected by what happens in its surrounding municipalities. For all municipalities, the coefficient is negative but non-significant, but for the intermediate ones there is a clear negative effect, suggesting a trivial disadvantageous outcome of neighboring municipalities' CCI specialization on the focal municipality's employment growth. This indicates that there might be a crowding-out effect or rivalry for resources, labor, or investment with neighboring regions, potentially restricting the focal municipality's employment growth. However, the coefficient becomes statistically insignificant when examined separately for different industries and typologies of municipalities (except for intermediate ones in Manufacturing and Services). This suggests that the spatial spillover effect is context-dependent and inconsistent across sectors. It is also possible that the spatial dynamics of CCIs might enhance growth in some sectors while constraining it in others. Still, one should note that interpreting spatial lag variables involves recognizing that they only reflect spatially correlated variables' impact and not the exact spillover processes. Further analysis is required to examine the specific sort of interactions (such as competition, collaboration, and knowledge spillovers) among municipalities.

When examining different sectors and types of municipalities the significance of *LQCCIs* coefficients varies across sectors and models. In summary, *LQCCIs* has a positive and significant effect over employment growth for Agriculture (all municipalities and rural ones), Construction

(all municipalities and rural ones) and Services (intermediate municipalities), but the effect is negative for Manufacturing (all municipalities). This heterogeneous effect can be explained in the context of the role of local sectoral composition of local growth differences (Holl, 2017). Intersectorial exchanges can happen when a shared knowledge base can foster a local innovative system that helps exchange information and enable networking, especially between creative and traditional sectors (Pittaway and Robertson, 2005).

[INSERT TABLE 5]

To control for the different dynamics at various levels of employment growth, we carry out a quantile regression model where the analysis is divided into three models focusing on production-oriented activities, producer services, and consumer services. Each model examines the relationship at different quantiles (0.25, 0.50, 0.75, and 0.90) of employment growth, offering insights into how the impact of specialization varies across municipalities experiencing different levels of employment growth. The results from the quantile model focusing on the aforementioned categorization/degree of specialization (see Table 5) show that the role played by local specialization in different groups of CCIs is asymmetric and relies heavily on particular industries and typologies of municipalities. In this regard, when focusing on the upper quantiles the positive and significant effects point solely to the *LQ Producer Services* which measures specialization in producer services, and the spatial lagged variable of Consumer Services (*WLQ Consumer Services*). Municipalities experiencing intense employment growth, mainly rural, are positively affected (in terms of growth) by a higher specialization in producer services. Pratt (1997) argues that CCIs are extremely disaggregated but strongly interconnected. Producer services are an important source of creative outputs, can introduce new innovations as inputs for other businesses (Stam *et al.*, 2008). These services can boost employment in rural regions, help create sustainable enterprise opportunities, and diversify rural economies (White, 2010). Also, consumer services and space are essentially interconnected, and their potential to enhance local employment growth is likely contingent on territorial rural mediating factors. Cultural heritage, museums and natural sceneries are a vital asset for rural villages in Catalonia, a key element of the identity of place and often the focus on a city's tourism (Panzera *et al.*, 2021). According to Innocenti and Lazzeretti (2019) CCI individual subsectors may not be capable of independently stimulating local employment growth. They may depend on the existence of other related sectors to create synergies and boost employment growth. While the spatial dimension of consumer services specialization is positively associated with employment growth in municipalities at the upper end of the employment growth distribution (i.e., specialization in this type of CCIs at neighbor municipalities), *WLQ Producer Services* shows a negative coefficient at the 0.25 quantile (statistically significant) but turns positive and insignificant at higher quantiles. This suggests a complex relationship where the spatial dimension of producer services specialization can both hinder and promote employment growth, depending on the level of employment growth within municipalities, and other territorial factors that might mediate such relationships.

This heterogeneous effect might be driven by several reasons related to the subsectors' specific characteristics, in terms of business and industry-lifecycle, value chains, production and consumption patterns, and clusters' location. The co-agglomeration patterns depend on the particularity of the knowledge base of the industries and is prone to local particularities of municipalities (Maddah *et al.*, 2023). These findings suggest the existence of strong heterogeneities in creative subsectors (He and Huang, 2016). Hence, policies targeting CCIs shall consider the

possible co-agglomeration patterns that may substantially attract the creative class and support regional employment growth. Overall, the impact of specialization in CCI categories on employment growth varies significantly by sector. Producer services and, to some extent, consumer services (in neighbor areas) contribute positively to employment growth, especially in municipalities at the higher end of the growth distribution. In contrast, production-oriented activities show a slight negative impact. The geographically weighted variables indicate that the spatial aspect of specialization plays a complex role, with both negative and positive impacts. This highlights the importance of considering geographical context and inter-municipality relationships in economic development strategies. Overall, the sector dimension seems to be very relevant for CCIs and, consequently, after a general approach in which main dimensions are identified, it is required to go deeper into industry-specific analyses.

[INSERT TABLE 6]

The quantile regression model findings for all CCIs and typologies of municipalities (see Table 6)¹¹ confirm earlier economic intuition by showing that the effect of *LQCCI* is significant and positive for upper quantiles (starting at 0.75). This finding suggests that although local specialization in CCIs is favorable for local employment growth, the relationship is restricted to more dynamic areas in job creation, predominantly rural municipalities. It is thus important to acknowledge the potential of cultural and creative industries in rural regions (Chapain and Strykiewicz, 2017). Since the dependent variable is measured in relative terms, higher employment growth tends to occur in places with initially low employment levels, leading to comparatively strong growth spurts. From these results, it also seems that specialization in CCIs is not associated with higher employment growth in urban areas.

[INSERT FIGURE 5]

The asymmetric roles of municipalities are easier to be observed in Figure 5, in which both quantile and OLS coefficients are reported¹². The solid black line is the zero line, the reference whereby the significance of the coefficients can be understood as follows: given that *none* of the confidence intervals overlap with the solid black line, this reflects a significant effect and vice versa. Focusing on the LQ variable makes it easy to see that the OLS and quantile coefficients differ significantly, especially for the lower quantiles. These findings support using a quantile regression strategy. Specifically, the first graph shows that the effect of local specialization in CCIs increases with employment growth and that the effect is only significant for the upper quantiles (0.75) and (0.90). In contrast, for the other quantiles (0.25 and 0.50), the confidence intervals overlap with the zero line, depicting a non-significant effect. The significant positive effects in the upper quantiles may be due to the characteristics of the municipalities. As for the entropy variable, the effect is significantly negative across all four quantiles. For the rest of the variables, there is a similar effect in terms of the dissimilarity of the effect of covariates on the dependent variable.

Glaeser *et al.* (1992) argue that specialization hinders job development at the city-industry level, whereas diversity enhances it. Our research indicates that we do not fully support this statement

¹¹ Interquantile regressions are shown in table A.5.

¹² Figure 5 portrays the results of both the estimation (1) in Table 4 (for total employment growth) and the estimation in Table 6.

concerning CCIs in Catalan municipalities from 2001 to 2011. Although many studies emphasize the significance of diversity for job creation (Glaeser *et al.*, 1992; Bishop and Gripaos, 2009), our research presents contrasting results. However, it is important to note that the characteristics of the local units in our study differ (i.e., smaller) from those in previous research. In the Catalan context and within our data timeline, Jacobs' externalities do not seem to lead to local employment growth. Similarly, for urbanization economies, population density is only significant for the first quantile and *infracap* is only significant for the upper quantiles.

Overall, our results provide full support for Hypothesis 2 and partial support for Hypothesis 1 and suggest that both urban and rural dimensions must be considered when analyzing local effects of CCIs. The econometric findings show that specialization in CCIs is not associated with high employment growth in all circumstances, but specifically in high-growth employment municipalities. Furthermore, industry-specific location quotients reveal asymmetric impacts among various CCIs categorization. Additionally, our findings highlight an uneven geographical distribution of the impact of CCIs specialization on job creation, and a nuanced one in rural regions, which is a novelty given the lack of analyses about small municipalities. This supports new arguments that micro clusters of different creative sectors make up an essential part of the creative economy, and the spillovers it generates are essential to rural economies and a potentially untapped resource for growth (Maddah *et al.*, 2023).

4.2 Robustness checks

The robustness of the results obtained in section 4.1 has been tested using alternative periods to avoid main disruptive effects of the economic crisis at the end of the 2000s. As in Spain the main effects of the economic downturn started in 2007-2008, we have analyzed the effect of CCIs on local employment growth between 2001 and 2007, and our findings (see table A.4 in the Appendices) provide similar effects in terms of the sign of the interest variable, LQCCIs, suggesting that our results are robust.

5. Conclusions

This paper contributes to understanding the dynamics between cultural and creative industries (CCIs) and local employment growth in Catalonia from 2001 to 2011 for urban, intermediate and rural municipalities by offering a new view of how local specialization in CCIs is associated with local employment growth. Using municipal-level employment data, we explore the relationship between specialization in CCIs and local employment growth differentiating by different typologies of municipalities and accounting for spatial dynamics. Our findings suggest that the specialization in CCIs is positively associated with employment growth in most sectors, but only for rural areas of Catalonia. The spatial lagged variable of that specialization suggests that there may be a dilution of this positive effect when neighboring regions also specialize in CCIs in general. In rural areas, CCIs' specialization seems to have a positive and significant association with employment growth, a situation that does not exist for urban areas, which highlights the structural differences between urban, intermediate and rural settings, at least for the municipalities covered by this analysis. Also, when categorizing CCIs, producer services and the spatial lag of consumer services are particularly positively associated with employment growth, mainly in areas already experiencing higher growth (i.e., rural ones). These differences highlight the need for

tailored economic development strategies that consider specific industries and types of municipalities as they have different geographies and different location patterns.

The geographical circumstances that initiate synergies between CCIs and other sectors vary according to the ability of CCIs to innovate and the characteristics of municipalities. The significance of CCIs as drivers of local employment growth remains a topic of controversy, and there is a scarcity of conclusive findings from empirical studies in view of heterogeneities observed for different areas. It might be suggested that a potential reason for this apparent contradiction lies on industry and municipality profiles, and this is why we have tried to disentangle earlier ambiguous results by considering grouped categories of CCIs (i.e., production-oriented activities, producer-services, and consumer-services) and different typologies of municipalities (i.e., urban, intermediate and rural). In this regard, our results corroborate the initial hypothesis that the effects of CCIs vary considerably across heterogeneous areas, implying that public administrations should be selective when choosing where and how to promote these activities. Their positive externalities seem to be stronger in rural and smaller areas, whilst their effects on large urban areas are (still) unclear and require some caution when designing public investment programs. Overall, we also show that the positive effects of CCIs on employment growth are identified when considering CCIs together, whilst it is hard to see clear effects arising from industry groups. This result suggests the potential existence of interindustry effects operating thanks to spillovers moving across CCIs and, therefore, may indicate that a successful local development strategy based on CCIs should consider a wide range of creative activities, rather than just promote a specialization in some of them. Appropriate policies should help to retain the creative class in rural regions and emphasize the role of creative industries in rural cultural and innovation policy schemes to leverage local assets and support CCI subgroups that can thrive in a rural setting. Improved digital infrastructure in rural areas can also help support employment growth.

This paper has used data of municipalities of different sizes, whilst most of the literature focuses on big urban areas. Nevertheless, as it is also true that mean size of municipalities in this data set is small and that the spatial range of labor markets may be larger than municipality boundaries, alternative spatial aggregation levels such as counties or local labor markets should also be tested in future research to corroborate our findings, as well as other spatial aggregation level considering commuting patterns to better account for the identification of labor markets. Nevertheless, our results have important implications for policy measures since the potentialities of CCIs should be carefully analyzed, taking into account specific industries and spatial contexts, given the heterogeneity of effects across the combined industry-space dimension. It is important to clarify that we are not diminishing the potential effects of CCIs, but rather trying to specify the conditions under which these positive effects exist. While recognizing the significance of big cities and urban areas, the findings challenge the predominant arguments that the creative economy is exclusively tied to urbanization.

In this sense, we show that local development strategies should consider the unique characteristics of rural areas and small cities to support creative rural economies that complement urban ones. The positive impact of CCIs in rural areas can be mediated by the characteristics of these municipalities, but additional research is needed to better clarify this point. Creative and non-creative workers can be attracted to smaller cities and villages which offer a variety of qualities/incentives that usually cannot be found in urban environments, such as residential

affordability, creative environment and attractive landscapes (McGranahan *et al.*, 2010), a more relaxing lifestyle (Townsend *et al.*, 2017), and a better quality of life. Hence, the findings can complement viewpoints that creative firms (and their employees) are establishing a strong relationship with rural places (McGranahan and Wojan, 2007) and that relatively smaller regions are also successful in attracting creative workers (Denis-Jacob, 2011) who may exploit local and new knowledge and build external connections that attract other workers. This reflects that the characteristics of a rural municipality, accompanied by a strengthened presence of CCIs, can develop the rural creative economy (Janc *et al.*, 2020).

Policy measures can have two “*multiplier effect*” benefits: to limit the pressures on urban areas with associated problems of gentrification, high population density, lack of affordable housing, and environmental pollution, among others, and to reduce the threats to rural areas associated with depopulation, deterioration of rural tourism, and endangered rural heritage, although it is true that the latter multiplier effect can be effective, it also requires certain initial conditions (e.g., proximity to urban cores or the presence of existing economic activities) and may vary depending on agglomeration patterns of production-oriented activities, producer-services and consumer-services. Essentially, support for specialization in industry-specific CCIs should be consistent with the knowledge bases of industries and their co-agglomeration patterns. In this respect, as highlighted by Szerb *et al.* (2020), such frameworks are needed to transform policy-thinking from traditional top-down and predominantly sectoral-led approaches to a more local, bottom-up innovation-led approach.

Furthermore, it is important to understand the type of creative jobs that individuals secure in rural areas, and the type of entrepreneurship in big cities, to design strategies that consider the differentiation between them. In many cases, rural areas are characterized as areas of stagnation, and thus, there is a need to develop a common vision and commitment among key players to create a favorable environment for creative jobs and creative enterprises. In addition, the specialization of CCIs can be seen as one way to regenerate specific locations by looking at the suburbanization path of some types of CCI businesses that require multi-disciplinary settings and foster their interactions with other sectors dynamically. Based on our findings, for the case of Catalonia and in terms of CCIs, these can be producer and consumer services. CCIs can also help rural areas and firms absorb technical innovations via inter-sectoral cooperation. Mobilizing cross-innovation between CCIs and traditional sectors could be prioritized by regional policy interventions, as creative production could help sectors rebound. Concretely, CCIs bring together art, business, and digitization and can create added value for a sustainable and inclusive modern economy¹³. Finally, funds can be allocated to support existing areas of specialization in CCIs, and those with potential to act as drivers of local development in rural, intermediate and urban areas, despite the potential effects of cognitive proximity between CCIs. Local resources and creative human capital can collaborate to foster local innovation systems.

Finally, in this paper we have contributed to recent discussions by concentrating on this spatial analysis in view of the lack of sufficient empirical research on CCIs’ disaggregated role in employment growth, especially at a local level (Collins and Cunningham, 2017; Escalona-Orcao *et al.*, 2016). Focus on CCIs is justified from their increasing importance in developed countries

¹³ Although in this paper we do not explicitly discuss inter and intra-sector cooperation, there is large empirical evidence (Koleva *et al.*, 2021) showing the existence of these processes.

and the increasing efforts devoted by public administrations to stimulating these industries in urban and rural areas (Sörvik *et al.*, 2019). All these analyses must be presented with the caveat that there is still some skepticism regarding the measurement of CCI effects, as i) some authors have overestimated their economic impact, ii) informal employment is very common in CCIs, and iii) there is a mismatch between creative jobs and creative industries that could generate some confusion. Additionally, it is important to acknowledge that this paper suffers from some limitations, as it refers to a single area, uses a relative measure of specialization in CCIs (which could imply a bias for small municipalities), and uses pre-COVID data, which suggest being cautious when discussing its findings and its policy implications. Nevertheless, the paper also opens avenues for future research, particularly in exploring the mechanisms through which CCIs influence employment growth and how these effects vary across different contexts.

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Tables

Table 1. Variables used in the Previous Literature on Agglomeration Economies

Variables	Dep. Var	Sector Specialization		Emp. Concen.	Diversity		UnRV	Competition	Urbanization Economies		Spatial Hetero.	Level of Human Capital		Income Distr.
Authors	Emp-Growth	LQ	Specialization Index	LQ	Other sectors' emp	Inverse HHI	Entropy	% firms/worker	Pop-Density	Reg/Pop Dummies	Regional Dummies	Residence/Work Ratio	High Edu	Gini Coefficient
Glaeser <i>et al.</i> (1992)	✓		✓		✓			✓			✓			
Henderson <i>et al.</i> (1995)	✓		✓			✓							✓	
Combes (2000)	✓		✓			✓			✓		✓			
Bishop and Grippaios (2009)		✓					✓	✓	✓		✓			
Eriksson <i>et al.</i> (2017)	✓			✓	✓			✓		✓		✓	✓	✓
Wang <i>et al.</i> (2016)	✓			✓	✓		✓	✓						

Notes: “EmpGrowth” indicates the change in the log of employment in a sector in a particular area over a period of time; “LQ” indicates the proportion of local employment accounted for by a sector in a specific locality divided by the proportion of employment accounted for by the sector nationally; “Other sectors’ emp” measures the logarithmic value of total employment minus the industry class in question; “Inverse HHI” indicates the inverse of a Herfindahl index of sectoral concentration based on the share of all sectors, except the one considered; “PopDensity” measures population per square kilometer; “Residence/Work Ratio” controls for the differences in qualitative functionality of municipalities (residential municipalities v. employment municipalities); and “HighEdu” measures the share of workers with at least a Bachelor’s degree.

Source: Authors’ own elaboration

Table 2. Variables: Data Sources and Descriptive Statistics

Variable	Definition	Year	Source	Mean	SD	Min	Max
Emp Growth	Employment Growth	2001 - 2011	Own calculation (based on employment data for 2001 and 2011 from the Social Security Register)	43.32	100.02	-78.05	1800
LQCCIs	Location quotient in CCIIs	2001	Own calculation	0.67	0.75	0	8.08
Entropy	Diversity (Theil) index	2001	Own calculation using the Geo-Segregation Analyzer (Apparicio <i>et al.</i> , 2014)	0.57	0.14	0.05	0.81
InfraCap	Mean distance to four provincial capitals (minutes)	2001	Own calculation	86.92	23.9	0	190
University	Intermediate and advanced university degree (% of workers)	2001	Own calculation from IDESCAT	16.34	6.17	2.32	50
Smallfirms	Jobs in firms with 0 to 50 employees (%)	2001	Own calculation	83.72	23.66	0	100
Popdensity	Population density	2001	IDESCAT	380.39	1522.4	0	21020

Table 3. Employment Growth and Municipality Size

Population	Employment growth 2001-2011 (%)	
	Mean	StdDev
< 1,000	65.23	127.29
≥ 1,000 & < 20,000	18.42	34.27
≥ 20,000 & < 50,000	.41	11.71
≥ 50,000 & < 100,000	6.92	19.35
≥ 100,000 & < 1,000,000	.15	13.33
≥ 1,000,000	2.08	-
Total	43.35	100.07

Source: Authors' elaboration

Table 4. Baseline OLS Model

Dependent Variable	Total Employment Growth 2001-2011				Employment Growth in Agriculture 2001-2011				Employment Growth in Manufacturing 2001-2011				Employment Growth in Construction 2001-2011				Employment Growth in Services 2001-2011			
	ALL	URB	INT.	RUR	ALL	URB	INT.	RUR	ALL	URB	INT.	RUR	ALL	URB	INT.	RUR	ALL	URB	INT.	RUR
LQCCIs	0.059*	-0.139**	0.046	0.066**	0.127**	0.226	0.048	0.149**	-0.073**	-0.149	-0.051	-0.061	0.063**	0.016	-0.055	0.075***	0.031	-0.068	0.091*	0.033
	(0.030)	(0.053)	(0.045)	(0.033)	(0.058)	(0.470)	(0.170)	(0.063)	(0.037)	(0.097)	(0.129)	(0.038)	(0.026)	(0.126)	(0.077)	(0.028)	(0.030)	(0.053)	(0.050)	(0.033)
WLQCCIs	-0.049	0.111	-0.140**	-0.034	-0.027	-0.575	0.080	-0.010	-0.056	-0.094	-0.302***	-0.011	-0.023	0.206	-0.035	-0.015	0.015	0.071	-0.116**	0.037
	(0.033)	(0.082)	(0.054)	(0.037)	(0.080)	(0.568)	(0.236)	(0.087)	(0.060)	(0.146)	(0.113)	(0.068)	(0.049)	(0.166)	(0.090)	(0.053)	(0.037)	(0.076)	(0.049)	(0.042)
Entropy	-1.349***	-2.238***	-1.497***	-1.292***	-2.784***	-6.353**	-3.019***	-2.401***	-0.298	-1.507***	-1.413*	0.055	-0.406**	-1.781***	0.040	-0.326	-0.368***	-1.479***	-0.664***	-0.195
	(0.127)	(0.330)	(0.225)	(0.149)	(0.252)	(2.455)	(0.689)	(0.286)	(0.226)	(0.533)	(0.775)	(0.277)	(0.196)	(0.419)	(0.483)	(0.240)	(0.135)	(0.395)	(0.231)	(0.159)
University	0.007***	0.009***	0.010***	0.005*	-0.019***	-0.035**	-0.042***	-0.009	0.012***	0.007*	0.002	0.017***	0.004	0.012**	0.009**	0.003	0.005**	0.003	0.007***	0.004
	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)	(0.016)	(0.009)	(0.006)	(0.004)	(0.004)	(0.004)	(0.006)	(0.004)	(0.005)	(0.004)	(0.005)	(0.002)	(0.003)	(0.003)	(0.003)
Popdensity	-8.98e-06	5.99e-06	-9.73e-05**	-7.54e-06	-7.83e-06	0.000	-0.000	-5.05e-06	2.70e-06	-8.99e-05	7.54e-05	5.20e-06	1.28e-05	2.17e-05	-0.001**	1.66e-05	-3.98e-06	-1.60e-05	7.31e-06	-2.97e-06
	(1.46e-05)	(6.33e-05)	(3.90e-05)	(1.47e-05)	(1.88e-05)	(0.000)	(0.000)	(1.80e-05)	(3.38e-05)	(0.000)	(8.94e-05)	(3.40e-05)	(1.74e-05)	(9.99e-05)	(9.39e-05)	(1.71e-05)	(7.76e-06)	(7.47e-05)	(3.58e-05)	(7.93e-06)
Infracap	-0.002**	0.003	-0.003***	-0.001*	0.005***	0.005	0.001	0.004***	-0.000	0.007	-0.003	-0.001	-0.001	0.002	-0.004	-0.001	-0.002**	0.002	-0.003**	-0.002**
	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)	(0.011)	(0.006)	(0.002)	(0.001)	(0.004)	(0.003)	(0.001)	(0.001)	(0.004)	(0.003)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)
Smallfirms	0.001	0.002	0.002*	0.000	-0.001	0.011	-0.001	-0.001	-0.000	0.001	-0.001	-0.001	0.002**	0.001	2.77e-05	0.003**	0.000	0.001	0.003**	6.11e-05
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.008)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Constant	0.986***	1.289***	1.150***	0.962***	2.435***	4.398**	3.357***	2.185***	-0.009	0.371	1.409*	-0.280	-0.126	0.447	0.010	-0.178	0.549***	1.082**	0.657**	0.484***
	(0.116)	(0.337)	(0.240)	(0.129)	(0.239)	(1.630)	(0.922)	(0.251)	(0.225)	(0.556)	(0.794)	(0.254)	(0.214)	(0.480)	(0.493)	(0.242)	(0.121)	(0.413)	(0.300)	(0.134)
R2	0.193	0.846	0.494	0.148	0.225	0.210	0.329	0.144	0.021	0.523	0.222	0.017	0.019	0.367	0.113	0.020	0.023	0.583	0.209	0.017
Obs.	942	53	121	768	830	49	114	667	854	51	115	688	893	51	118	724	941	53	121	767

Estimations are conducted for all municipalities (ALL), Urban ones (URB; from 20,000 inhabitants), Intermediate ones (INT; from 5,000 up to 19,999 inhabitants) and Rural ones (RUR; below 5,000 inhabitants).

Robust standard errors in brackets. Significance codes: * p<0.05; ** p<0.01; *** p<0.001

Source: Authors' elaboration

Table 5. Quantile Model at Subindustry Level of CCIs (Production, Producer Services and Consumer Services)

Models		(1)	(2)	(3)	(4)				
	θ	0.25	0.50	0.75	0.90				
	Dependent Variable	Employment Growth 2001-2011							
		Coeff	Robust Std Err	Coeff	Robust Std Err	Coeff	Robust Std Err	Coeff	Robust Std Err
(A)	Constant	0.41***	(0.107)	0.91***	(0.091)	1.40***	(0.128)	2.16***	(0.183)
	LQ Production	-0.02	(0.011)	-0.03**	(0.009)	-0.02	(0.013)	-0.03**	(0.018)
	WLQProduction	-0.02	(0.014)	0.01	(0.012)	-0.01	(0.017)	-0.01	(0.024)
(B)	Constant	0.40***	(0.109)	0.90***	(0.092)	1.36***	(0.114)	2.19***	(0.189)
	LQ Producer Services	0.04	(0.013)	0.01	(0.011)	0.01	(0.014)	0.11*	(0.023)
	WLQProducer Services	-0.11*	(0.03)	0.01	(0.025)	0.08	(0.031)	0.15	(0.051)
(C)	Constant	0.42***	(0.111)	0.89***	(0.10)	1.35***	(0.16)	2.10***	(0.19)
	LQ Consumer Services	0.01	(0.024)	0.02	(0.02)	0.02	(0.02)	0.02	(0.04)
	WLQConsumer Services	-0.01	(0.036)	0.06	(0.031)	0.04*	(0.037)	0.14*	(0.063)
Number of Observations		942	942	942	942				

Significance codes: * p<0.05; ** p<0.01; *** p<0.0

Note: there is only two independent variables for each of these regressions

Source: Authors' elaboration

Table 6. Quantile Regression Model

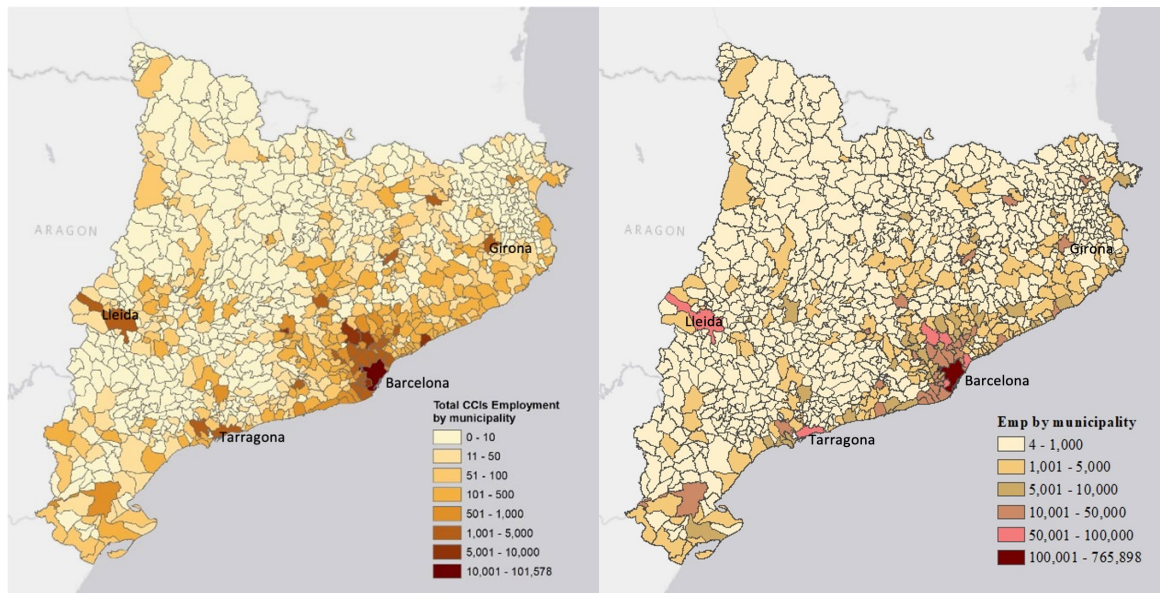
θ	0.25	0.50	0.75	0.90
LQCCIs	-0.01 (0.019)	0.001 (0.017)	0.08** (0.021)	0.12*** (0.034)
WLOQCCI2001	-0.02 (0.034)	-0.02 (0.31)	-0.06 (0.038)	-0.08 (0.062)
Entropy	-0.77*** (0.108)	-1.29*** (0.097)	-1.71*** (0.119)	-2.56*** (0.194)
University	0.01*** (0.002)	0.01*** (0.002)	0.01** (0.003)	0.01 (0.004)
Popdensity	-0.00** (0.000)	0.00 (0.000)	-0.00 (0.000)	-0.00 (0.000)
Infracap	-0.00 (0.000)	-0.00 (0.005)	-0.00* (0.000)	-0.00** (0.001)
Smallfirms	0.00 (0.000)	0.00 (0.000)	0.00 (0.000)	0.00 (0.001)
Constant	0.45*** (0.109)	0.90*** (0.101)	1.35*** (0.123)	2.28*** (0.201)
Pseudo R2	0.057	0.135	0.20	0.26
Number of Observations	942	942	942	942

Significance codes: * p<0.05; ** p<0.01; *** p<0.001

Source: Authors' elaboration

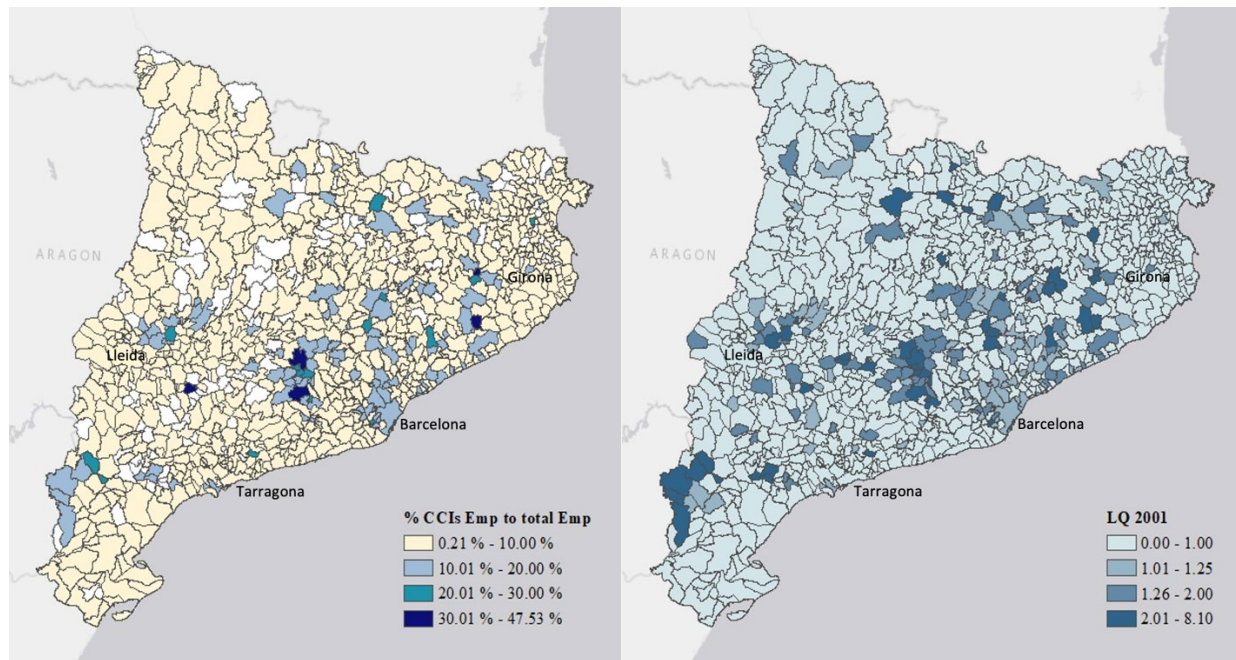
Figures

Figure 1. CCIs Employment and Total Employment by Municipality in 2001



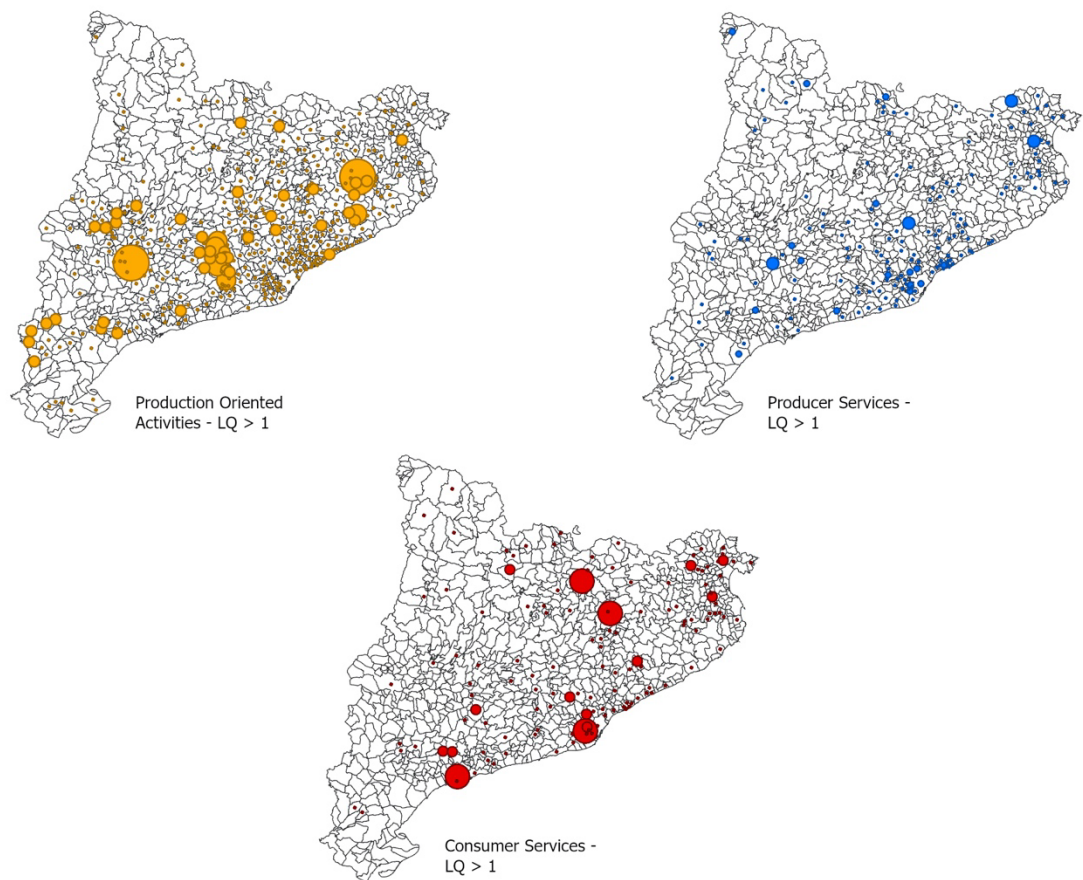
Source: Authors' elaboration.

Figure 2. Specialization in CCIs in 2001



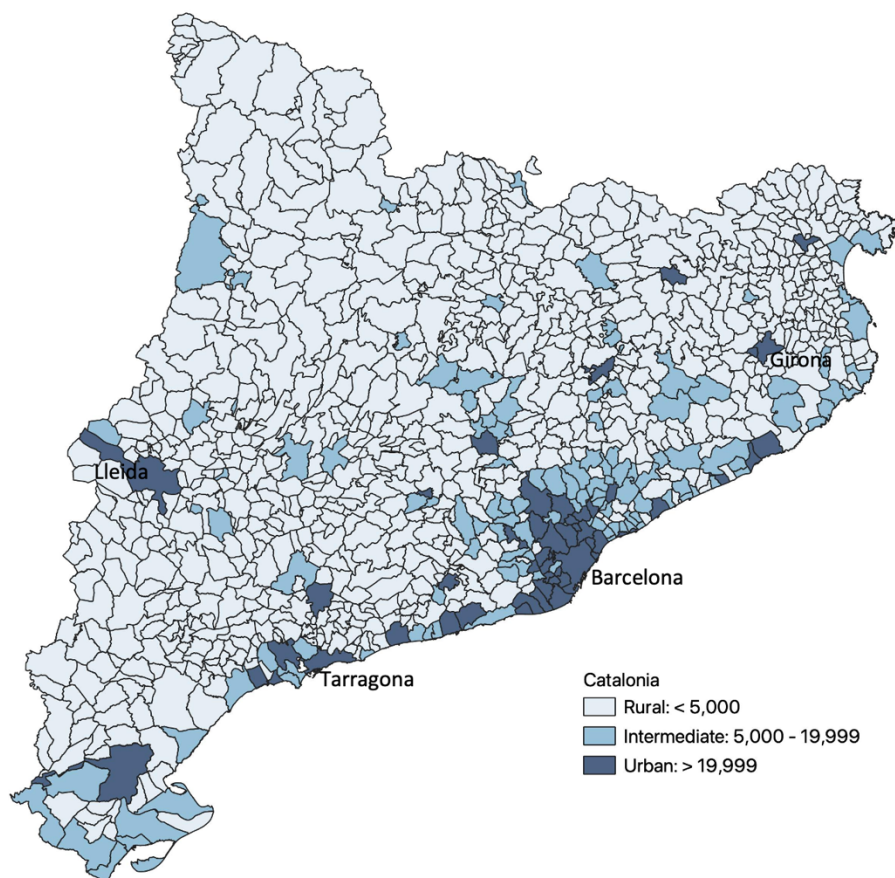
Source: Authors' elaboration.

Figure 3. Specialization in Cultural and Creative Industries: Classification



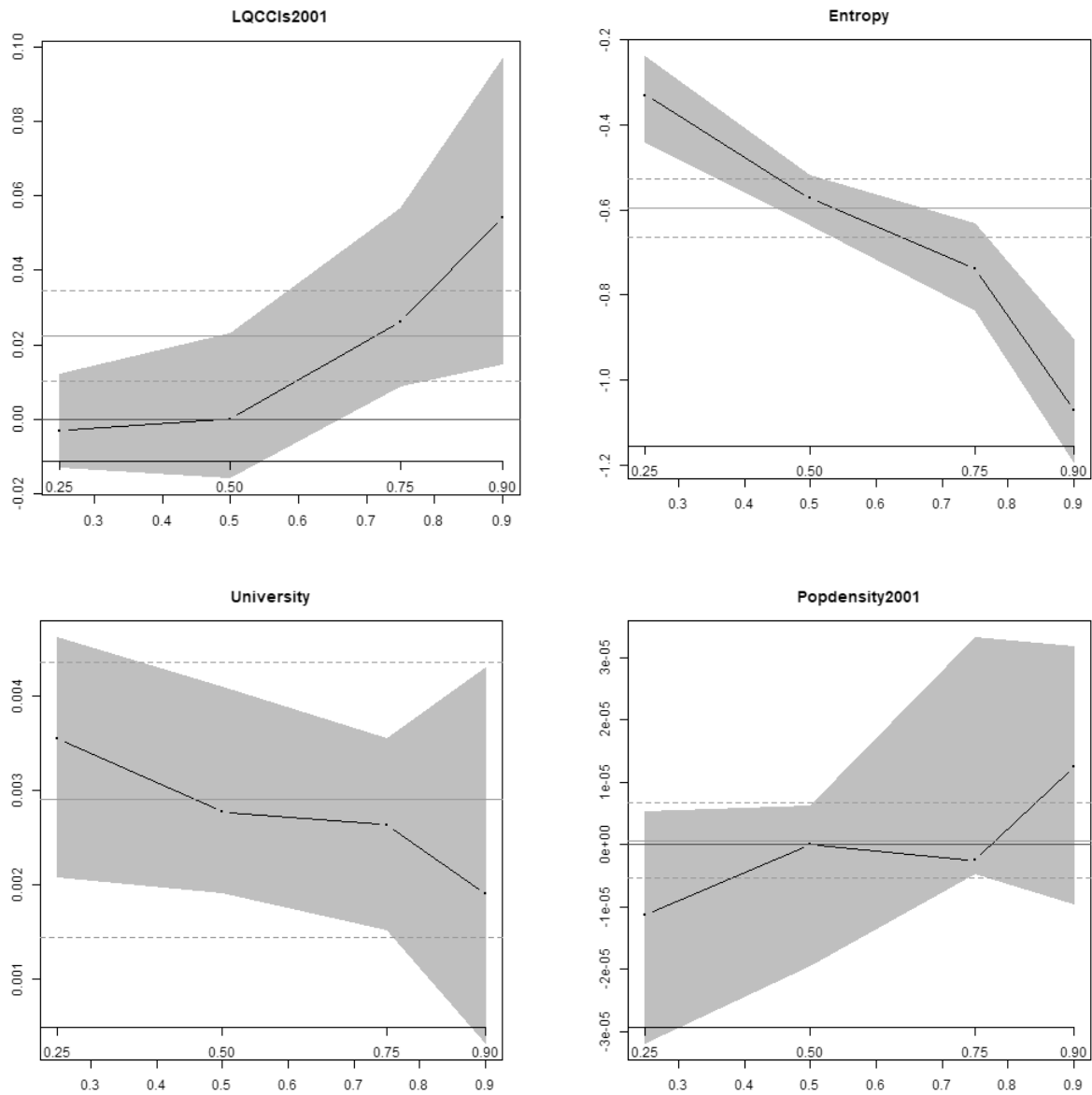
Source: Authors' elaboration

Figure 4. Typology of Municipalities: Urban, Intermediate and Rural



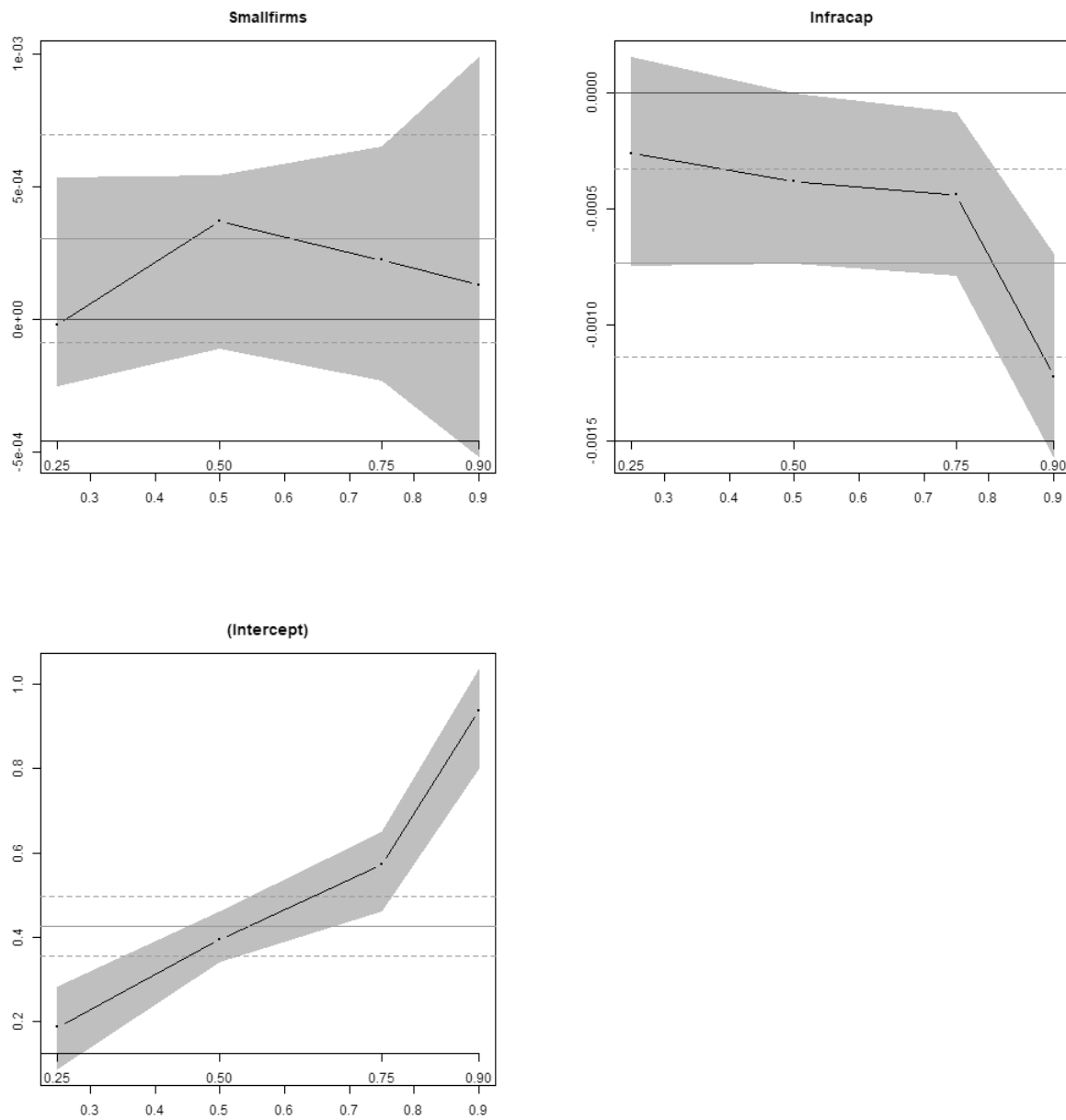
Source: Authors' elaboration.

Figure 5. OLS and Quantile Regression Coefficients



Source: Authors' elaboration.

Figure 5. OLS and Quantile Regression Coefficients (cont.)



Source: Authors' elaboration.