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SPATIAL PATTERNS OF THE CREATIVE ECONOMY IN BRAZIL

PADRÕES ESPACIAIS DA ECONOMIA CRIATIVA NO BRASIL

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Abstract

The objective of this article is to analyze the spatial structure of the Creative Economy in Brazil and to present the geographic patterns of location of this sector. Using employment data for the year 2018 for the 558 Brazilian micro-regions, an Exploratory Spatial Data Analysis (ESDA) was developed, presenting the geographic patterns by percentiles, and by agglomerations (LISA analysis) for the Creative Economy sector as a whole, as well as for each of its four subsectors (Consumption, Culture, Media and Technology). It was observed that, in line with results from other parts of the world, employment in the Creative Economy in Brazil tends to be concentrated in the main metropolitan regions, mainly in the metropolitan region of São Paulo. It was also observed that there are employment enclaves in regions neighboring the metropolitan regions, such as in the consumption and culture sub-sectors, and in regions with the presence of cutting-edge universities and research centers, as in the technology sub-sector.

Keywords: Creative economy. Regional development. Explanatory Spatial Data Analysis (ESDA). Spatial Patterns.

Resumo

O objetivo deste artigo é analisar a estrutura espacial da Economia Criativa no Brasil e apresentar os padrões geográficos de localização deste setor. Utilizando dados de emprego para o ano de 2018 para as 558 microrregiões brasileiras, será elaborada uma Análise Exploratória de Dados Espaciais (AEDE), apresentando os padrões geográficos por percentis e por aglomerações (análise LISA) para o setor de Economia Criativa como um todo, bem como para cada um de seus quatro subsetores (Consumo, Cultura, Mídia e Tecnologia). Foi observado que, em linha com resultados de outras partes do mundo, o emprego em Economia Criativa no Brasil tende a se concentrar nas principais regiões metropolitanas, principalmente na região metropolitana de São Paulo. Observou-se também que há enclaves de emprego em regiões vizinhas às regiões metropolitanas, como nos subsetores de consumo e cultura, e nas regiões com presença de universidades e centros de pesquisa de ponta, como no subsetor de tecnologia.

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Palavras-chave: Economia Criativa. Desenvolvimento Regional. Análise Exploratória de Dados Espaciais (AEDE). Padrões Espaciais.

Introduction

In the information age, Creative Economy (or creative industry) is a recently developed concept that involves the sectors which develop goods or services that have some creative component. According to FIRJAN (2019), the sector formed by the creative industries encompasses the set of economic activities related to the production and distribution of goods and services that use the creativity and skills of individuals or groups as primary inputs.

For IPEA, Creative Economy is “the set of economic activities that depend on symbolic content – including creativity as the most expressive factor for the production of goods and services, keeping a close relationship with economic, cultural and social aspects that interact with technology and intellectual property” (OLIVEIRA; ARAUJO; SILVA, 2013).

There is still no consensus regarding the definition of the term Creative Economy. For UNCTAD (2013), Creative Economy is formed by a set of “Knowledge-based” economic activities, that is, which have specific knowledge in common, and which are the core of the Creative Industry. According to the Department of Culture, Media and Sports (DCMS) of the United Kingdom (DCMS, 2011), the main characteristic of the creative industries is intellectual property.

In any case, the contribution of Creative Industries (CIs) to economic growth is an important issue that attracts increasing attention in both academic and public policy spheres. In the discussions of policies to promote economic growth, the assumption is that CIs make a major contribution to the growth of the entire economy, also contributing significantly to youth employment and growth in smaller municipalities (COMUNIAN; FAGGIAN, 2011).

In fact, in recent years, interest in CI-led development in the field of regional growth has also grown. The basic idea is that culture and creativity are the main forces that drive urban and regional development. For Anderson and Mellander (2011), the cultural and creative economy is an important force that shapes knowledge-based economies and is conducive to sustainable regional development, with more jobs created and greater social cohesion.

Furthermore, by operating at the crossroads between arts, business, technology and ecology, CIs are assumed to benefit other industries through indirect and induced effects. Likewise, CIs create positive externalities in other areas of society, such as education, social inclusion and community life (DCMS, 2011).

Despite the relevance of the topic and the recent progress in studies in the world on the topic Creative Economy, relatively few studies have been developed for Brazil as a whole, and, in particular, for the spatial distribution of the sector in the country. Thus, the objective of this article is to analyze the spatial structure of the Creative Economy in Brazil and present its geographical patterns of location. Using employment data for the year 2018 for the 558 Brazilian microregions (IBGE, 2020), an Exploratory Spatial Data Analysis (ESDA) was prepared presenting the geographic patterns by percentiles, and by agglomerations (LISA analysis) for the Creative Economy sector as a whole, as well as for each of its four subsectors (Consumption, Culture, Media and Technology).

This article helps to fill a gap in the literature on the spatial distribution of the Creative Economy in the country using a regional division of Brazilian microregions. The importance of this study is also justified by the need to expand the literature on the subject in the country, still small for a growing sector in relation to the country's GDP, which, according to FIRJAN (2019), already represents about 2.7 % of Brazil's GDP (R\$171.5 billion in 2017).

This text is divided into five sections, including this introduction. In the next section, a review of the literature will be presented on the conceptualization of Creative Economy, and on studies of the sector in the world and in Brazil. In the third section, the methodology and data used will be outlined. In the fourth section, the main results will be presented, and in the last section some final considerations are presented by way of conclusion, in addition to the bibliographic references that were used here.

Literature Review

In this section, a theoretical discussion will be presented on the concept of Creative Economy, as well as on the impacts of the sector's activities. Next, the literature on the studies that sought to describe, evaluate and monitor the sector in the world and in Brazil will be presented, including studies on the spatial patterns of distribution of the sector in the country and abroad.

The Creative Economy: Concept and Impacts

A first important point addressed by the literature on the subject is the very conceptualization of Creative Economy. This concept arises from a new form of relationship between creativity and the traditional economy, with regards to the production, distribution and consumption relations. According to the United Nations Conference on Trade and Development (UNCTAD, 2013), the creative economy is an evolving concept based on creative assets that potentially generate economic growth and development. In this way, it generates income, creates jobs and can even increase exports. It is a sector that also promotes social inclusion, cultural diversity and human development (UNCTAD, 2013).

However, as mentioned in the previous section, there is still no consensus regarding a single definition for the term Creative Economy. Thus, the Creative Economy sector will be defined here as in UNCTAD (2013) and comprises the concept of “the production chain that is composed of the cycles of creation, production and distribution of goods and services that use creativity and intellectual capital as primary inputs” (UNCTAD, 2013).

In line with this understanding, the Creative Industry chain is formed by three major categories, according to UNCTAD (2013):

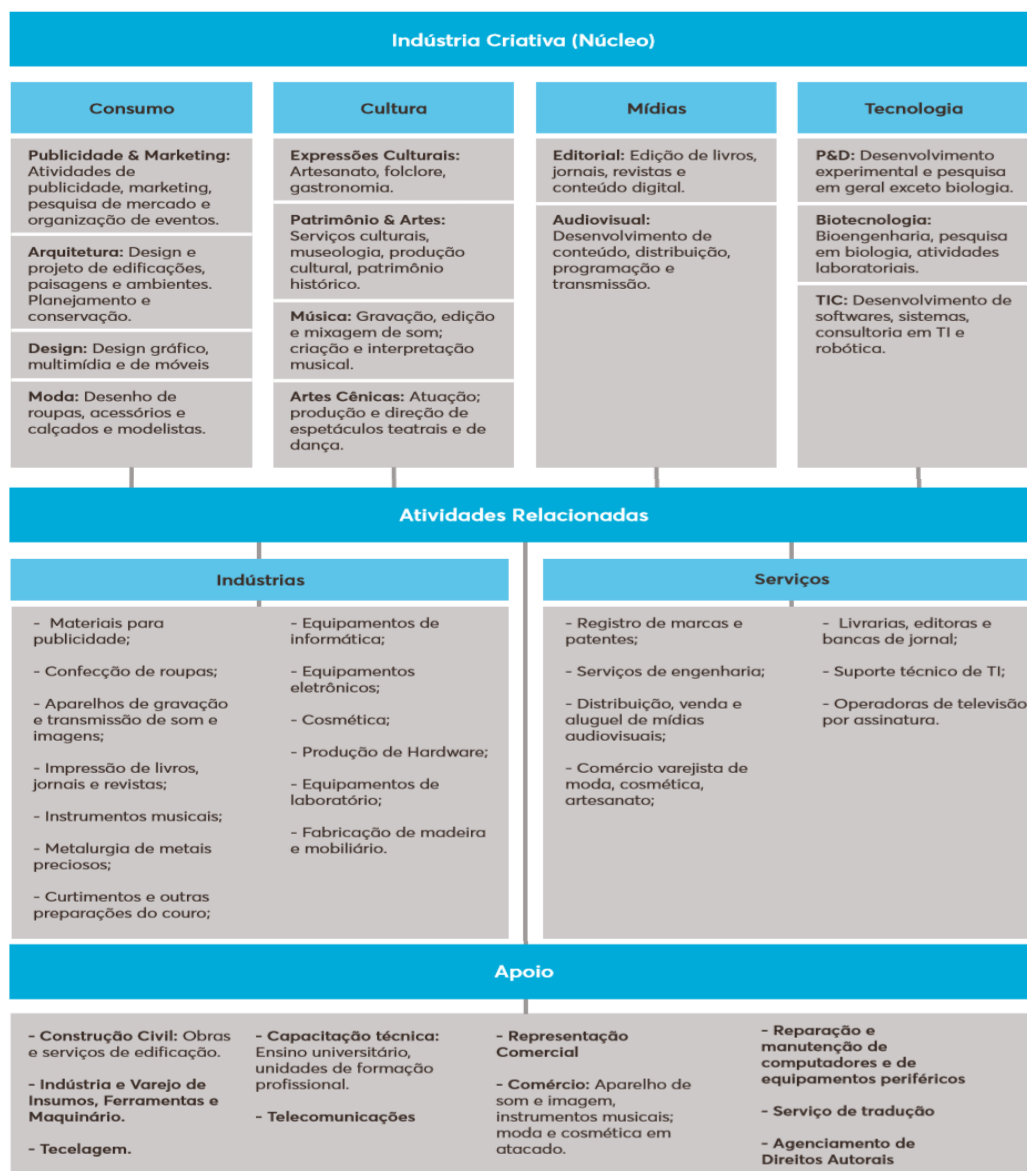
1) Creative Industry (Core) - Comprised of professional and/or economic activities that use ideas as the main input to generate value;

2) Related Activities - Comprised of professionals and establishments that provide goods and services to the Creative Industry. It is mostly represented by industries and service companies, suppliers of materials and other elements that considered fundamental for the functioning of the creative core;

3) Support - Formed by suppliers of goods and services, indirectly, to the Creative Industry.

In line with the definition of UNCTAD (2013), FIRJAN (Federation of Industries of the State of Rio de Janeiro) has also adopted its conceptualization and methodology for the construction and mapping of the evolution of the sector in Brazil (see Figure 1 below). This institution has been preparing reports on the sector since 2004, the last available text being the Mapping of the Creative Industry in Brazil 2019.

In order to classify the sectors that make up the Creative Economy Core, the economic activities covered by the Creative Economy for FIRJAN (2019) are grouped into 13 segments, according to their sectoral affinities, grouped in turn into four major sectors: Consumption, Culture, Media and Technology.

Figure 1: Sectors and Production Chain of the Creative Economy in Brazil

Source: FIRJAN (2019).

The Consumption sector within the Creative Economy involves the advertising and marketing subsector, which includes marketing activities, market research and event organization. It also includes the architecture subsector, which consists of design and projects of buildings, landscapes and environments, as well as planning and conservation. Moreover, it includes the Design subsector, with graphic, multimedia and furniture activities. Finally, it includes the fashion subsector, which includes the design of clothes, shoes and accessories, and patternmakers.

The Culture sector is composed of the cultural expressions subsector, which includes activities such as handicrafts, folklore and gastronomy; it includes the heritage and arts subsector, which aggregate activities of cultural services, museology, cultural productions and historical heritage; it includes the music subsector, which comprises activities from sound recording, editing and mixing to musical creation and interpretation; and it also includes the performing arts subsector, which includes acting, producing and directing theater or dance shows.

The Media sector includes the editorial subsector, which includes the edition of books, magazines, newspapers and digital content; and the audiovisual subsector, which includes content development, distribution, programming and broadcasting. Finally, the Technology sector includes

the research and development subsector, with experimental development and general research activities (except biology); it includes the biotechnology subsector, which focuses on bioengineering, biology research and laboratory activities; and it includes the information and communication technologies (ICTs) subsector, which includes the development of software, systems and consultancy in IT and robotics.

Another important point addressed in the Creative Economy literature is the discussion about the impacts of the sector's activities. In addition to generating income and employment in the sectors that comprise it (the core of the Creative Economy), the activities of the Creative Industries (CIs) also impact other related and support activities. As for the related activities (see Figure 1), there are the industries of materials for advertising, printing of books, magazines and newspapers, and the clothing industry, tanning and leather preparation. Other examples are the metallurgical industry of precious metals, the production of computer hardware and equipment, electronics and the entire cosmetics industry, laboratory materials and the like.

There are also impacts on services related to CIs. Important examples are engineering services, fashion, cosmetics and handicraft retailing, television operators, trademark and patent registration services, bookstores, publishing houses and newsstands, Information Technology technical support, among others. Finally, it is worth noting that there are also impacts of CIs on support activities, such as civil construction and building works, retail of tools and machinery, schools and universities (for technical training), commercial representation, telecommunications, media, copyright agency and translation services, among other support activities (see also Figure 1).

It is worth noting that the impacts of the Creative Economy go beyond the direct, indirect and induced effects on the entire production chain of CIs. In addition to the contribution of CIs to the growth of the entire economy, this sector also contributes significantly to the increase in employment, in particular, youth employment. It also contributes significantly to the growth of smaller regions and municipalities (COMUNIAN; FAGGIAN, 2011).

For Anderson and Mellander (2011), the basic idea is that culture and creativity are the main forces that drive urban and regional development. The discussion about CIs in the academic, public policy and business spheres is increasingly intense, both on theoretical issues and on empirical analyses. This growing literature covers a number of multidimensional issues that start from the assumption that the cultural and creative economy is an important force shaping knowledge-based economies and is conducive to sustainable regional development, with more jobs created and greater social cohesion (ANDERSON; MELLANDER, 2011).

Furthermore, for DCMS (2011), by operating at the junction between arts, business, technology and ecology, CIs, in addition to benefiting other industries through indirect and induced effects, create positive externalities in other areas of society, such as in areas of education, social inclusion and community life.

Finally, for IPEA, the Creative Economy sectors include some economic activities that were previously considered non-economic (informal or otherwise), with no potential to generate income; with the new vision of Creative Economy, such activities have the effective potential to add value, income and employment, especially for people in situations of social vulnerability (OLIVEIRA; ARAUJO; SILVA, 2013).

In short, for FIRJAN (2019), whether in the design of the product itself or in its packaging, or in the technology that involves its production process, or in the value of a brand or in the advertising campaign formulated for its dissemination, CI is currently a key point in the production chain, with creative activity being “an input as relevant as capital, labor and raw materials” (FIRJAN, 2019).

Creative Economy in the World and in Brazil

Regarding the studies that sought to describe, evaluate and monitor the sector in the world and in Brazil, since the pioneering study by Florida (2002), it is worth mentioning some important studies. The first is the report by the United Nations International Trade and Development body (UNCTAD, 2013, updated in 2018). This report describes the trends in world trade in creative goods and services by country, providing an outlook on the global creative economy for the period. The report included industry profiles for 130 countries, highlighting potential opportunities for developing countries to increase their production, exports and market share in the creative

industries. Finally, the report pointed to increased investment by the public and private sectors in CIs.

Since 2001 (DCMS, 2001), the United Kingdom Ministry of Culture, Media and Sport has been preparing reports with statistics and monitoring analysis of the creative industries sector in that country; it is worth noting that this initiative was a pioneer for the sector. Finally, it is important to mention the report made by another institution of the United Nations, the Development Program. Prepared in the context of developing countries, the report highlighted the importance of promoting creative industries so that they can act as an engine of economic development for that group of countries. In addition, it mapped the sector's performance and recent government policies to the sector's growth in developing countries in Asia, Africa and Central and South America (UNDP, 2013).

In Brazil, as already mentioned, FIRJAN has been following the sector, preparing studies on a bi-annual basis. Entitled Mapping of the Creative Industry in Brazil, this study updates statistical data and analyzes on the evolution of the sector for the four subsectors and thirteen segments that make up the Creative Economy sector. The analyzes are made for the total GDP of the sector for Brazil and for the states, by employment and wage bill, as well as for the main professions that make up the segments.

BNDES also prepared an important study for the Creative Economy sector (BNDES, 2011). In that study, it sought to systematize themes and actions to promote creative and cultural industries in Brazil. To promote sector development policies, he proposed the "4C Agenda": expanding access to credit and financing; actions for consumer market growth; technical and business training initiatives; and articulation to share market knowledge and methodologies. According to the study, the implementation of initiatives in these four axes can greatly contribute to Brazilian development.

In turn, IPEA (OLIVEIRA; ARAUJO; SILVA, 2013) prepared an overview of the Creative Economy sector in Brazil. In this study, the authors discussed the conceptualization and measurement methods around the world, and presented a measurement of the creative economy in Brazil. The study concluded that the formal creative economy represents between 1.2% and 2% of the Brazilian Gross Domestic Product (GDP) and approximately 2% of the workforce and 2.5% of the formal wage bill. It also concluded that Creative Economy workers earn more and are more educated than the average Brazilian workers.

It is also worth noting that there are studies on the Creative Economy from the point of view of the Brazilian states. In its publication *Ensaio & Conjuntura*, Fundação SEADE analyzed the evolution of the sector in the state of São Paulo between 2012 and 2016 (SEADE, 2016). The Federal University of Rio Grande do Sul (VALIATI; MOLLER, 2016) carried out a study on the theoretical and empirical aspects of the sector in Brazil, abroad and in the state of Rio Grande do Sul.

A final point to be discussed in this section is the availability of studies on regional aspects and on spatial patterns of distribution of the sector abroad and in the country. Bertacchini and Borrione (2013) analyzed the spatial structure of the creative industries in Italy. Using company data, the authors highlighted the different spatial and organizational patterns of cultural production systems in urban and regional areas of the country. They concluded that while large metropolitan areas remain the most important areas of concentration for the Creative Economy in Italy, craft sectors and design systems tend to be located in smaller centers outside metropolitan areas.

He and Gebhardt (2014) examined the spatial characteristics of creative clusters in Shanghai (China) and their connection with the country's urban historical, social, cultural and political aspects. Using a spatial analysis software (or Geographic Information System, GIS), the authors concluded that clusters of creative industries are concentrated in specific locations in Shanghai, mainly in the city center, in former industrial districts, in locations close to universities, shopping centers and in tourist and entertainment areas. Finally, they show that the creative industries have become important instruments in the urban recovery of the city center.

In turn, Kiroff (2017) investigated the spatial distribution of the Creative Economy Design sector in the city of Auckland (New Zealand), for the architecture, specialized design and advertising subsectors. As a result, architectural and specialist design firms showed similar spatial distribution patterns distributed throughout the Auckland region, while the advertising sub-sector showed a trend towards spatial concentration in central Auckland and, in particular, in the Parnell neighborhood.

In the case of Brazil, the study by Dias and Lima (2019) aims to identify the potential for productive agglomerations related to the Creative Economy sector in Brazil. Using the methodology of multivariate analysis of clusters to estimate the groups of homogeneous municipalities in terms

of creative industry, and using data from the 2000 and 2010 Census of the IBGE, the authors classified the groups of municipalities into three types of productive clusters, notably, large national creative hubs, national creative hubs and regional creative hubs. They concluded that the cities that formed such clusters stand out due to their urban infrastructure, institutional robustness, governance, presence of specialized labor, position in the urban hierarchy and proximity to the most dynamic axis of the country.

Souza, Benavides and Pires (2015) analyzed the location profile of creative economy production activities in the Northeast region of Brazil between 2006 and 2013. Using Location Quotients (QLs) for total employment in the Creative Economy core sectors, the authors pointed to a growing productive structure, but regionally unequal: in 2013, only Maranhão and Pernambuco presented an QL greater than one (evidencing specialization) for those sectors.

Finally, Stein, Adamczyk, and Fochezato (2020) investigated the spatial distribution of creative classes and human capital in Brazilian microregions and examined the relationship of these variables with regional economic development. The authors tested the explanatory power of the Creative Capital Theory against that of the Human Capital Theory for the differences in per capita income between the microregions. Their results indicated that the microregions with the highest GDP per capita and a good part of the population with a high level of education are concentrated in the regions of the southern half of Brazil. Creative capital and human capital are associated with the level of development of microregions, but the latter presented a more explanatory result. They highlighted the presence of agglomerations for both variables in the southern half of Brazil, and, through a spatial econometric model, pointed out the greater effect of human capital than that of creative capital on the development of Brazilian microregions.

Methodology

In this study we seek to evaluate the spatial structure of the Creative Economy core sector as a whole as well as for its subsectors (as defined in Figure 1 above), namely Consumption, Culture, Media and Technology. To this end, an Exploratory Spatial Data Analysis (ESDA) was developed. Initially, the employment map by percentiles was presented to get an idea of the distribution of employment in the Creative Economy sector as a whole. Subsequently, in order to detect and understand whether there are spatial interactions present in the Creative Economy data, the hypothesis that employment is autocorrelated in space for Brazilian microregions was tested, that is, microregions with similar levels of employment tend to be located close to each other. Thus, the univariate Moran I Global statistic was calculated (ALMEIDA, 2012).

Then, an analysis was carried out for the presence of spatial agglomerations of microregions, known as LISA Analysis (ALMEIDA, 2012). In this analysis, we tested the presence of clusters of microregions with a high level of employment in the Creative Economy sector with neighboring microregions also with a high level of employment in this sector (high-high cluster). This would be evidence of the spillover of employment in the Creative Economy core to the neighboring microregions that belong to that cluster. The LISA analysis (or univariate Moran's Local I statistic) also tests low-low, high-low, and low-high clusters of employment in the Creative Economy. Finally, the LISA Analysis was performed to determine the spatial patterns of the clusters also for the four subsectors of the Creative Economy.

Regarding the data, employment data were collected from MTE (2018) for the core sector of the Creative Economy and for the four subsectors in the year 2018 for the 558 Brazilian microregions. In addition, the GeoDA software was used, using a shape file that contains the 558 microregions of Brazil. The composition of the Creative Economy core sector and its four subsectors was defined through the sum of employment in all employment categories defined in the Brazilian Occupational Code (CBO), using the same classification used in FIRJAN's Creative Economy Industry Mapping reports (2019); such composition is detailed in Azambuja (2020).

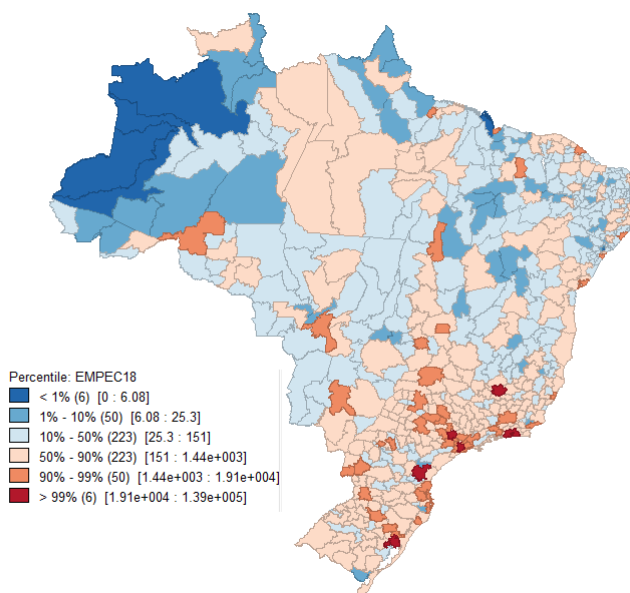
Results

In this section, the main results of the analysis of the spatial structure of the Creative Economy sector in Brazil will be presented. An Exploratory Spatial Data Analysis (ESDA) will be prepared, in which employment maps by percentiles for the microregions of Brazil in 2018 will be presented first, to highlight the spatial distribution of the Creative Economy core sector. Next, the univariate Moran I Global statistic (ALMEIDA, 2012) will be calculated to detect the presence of

spatial autocorrelation for total employment in the sector. Finally, an analysis will be carried out for the presence of spatial agglomerations of micro-regions (LISA Analysis) in the year 2018 for the total employment level in the Creative Economy core sector as well as for the four subsectors of the Creative Economy (Consumption, Culture, Media and Technology).

Figure 2 below shows the spatial patterns of total employment in the Creative Economy core sector for microregions by percentiles in 2018. First, it is noted that microregions with Creative Economy employment in the percentile above 99% (greater than 19,100 jobs) are those that concentrate the largest cities and metropolitan regions in the country, such as São Paulo, Campinas, Curitiba, Porto Alegre, Rio de Janeiro and Belo Horizonte. This result is in line with studies carried out in other parts of the world (cf. BERTACCHINI; BORRIONE, 2013). As for the employment percentile in Creative Economy between 90% and 99% (between 1,440 and 19,100 jobs), it is spread out in other regional capitals and metropolises, such as the capital cities of the Northeast Region; Florianópolis, Joinville and Blumenau; regions of Serra Gaúcha and West of Paraná; some of the capitals of the Central-West and North Regions; Triângulo Mineiro and Juiz de Fora; and several microregions in the interior of the state of São Paulo.

Figure 2: Total Employment in the Creative Economy for the Brazil Microregions by percentil, 2018



Source: MTE (2018) and authors elaboration.

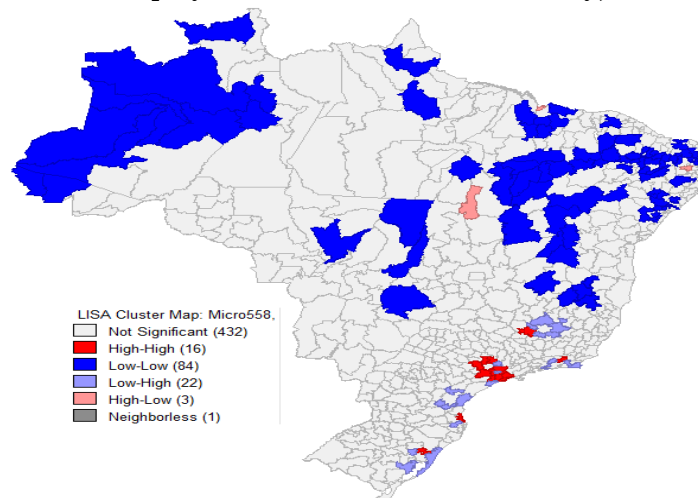
Next, we proceeded with the analysis of the univariate Moran I Global statistic; in our case, the value of Moran's I (0.044) is greater than the expected value (minus 0.0018), giving a clear indication that employment in the Creative Economy core sector is self-correlated in space for Brazilian microregions (ALMEIDA, 2012) in 2018. Furthermore, these results are invariant regardless of the spatial weight matrix that is adopted³. Thus, there is evidence of positive spatial autocorrelation in the data, that is, Brazilian microregions with a high (low) level of employment in the Creative Economy are neighbors of Brazilian microregions with a high (low) level of employment in the Creative Economy, which suggests the presence of agglomerations (clusters) of this sector in the country.

Moreover, a LISA analysis was prepared, which aims to detect the presence of spatial agglomerations of Brazilian microregions in the year 2018 for the total employment level in the Creative Economy core sector, as well as for the four subsectors of the Creative Economy (Consumption, Culture, Media and Technology). In Figures 3 to 7 below, such agglomerations are marked in red. For total employment in Creative Economy (Figure 3), a main cluster around the Metropolitan Region of São Paulo can be observed, which extends and encompasses several neighboring microregions in the interior of the state, ranging from Campinas (towards the north) to

³ In order to choose a spatial weight matrix, the rook, queen and k-neighbors (with k ranging from 1 to 20) matrices were tested. After performing the regression several times using the different matrices, the one that generated the highest value of Moran's I being statistically significant was the contiguity queen matrix, which was thus chosen.

Sorocaba and Limeira. There are also some smaller clusters around the cities of Blumenau, Porto Alegre, Belo Horizonte and in the mountainous region of the state of Rio de Janeiro.

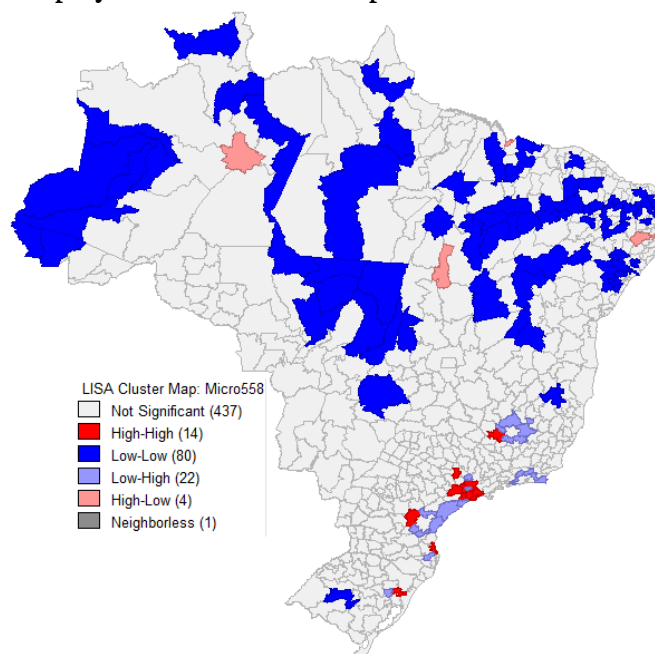
Figura 3: LISA Map for Total Employment in the Creative Economy, 2018



Source: MTE (2018) and authors elaboration.

Regarding the presence of employment clusters in the Consumption subsector (which encompasses architecture, design, advertising and fashion) of the Creative Economy (Figure 4), it can be observed that the pattern is similar to total employment in the Creative Economy, that is, there is an agglomeration of employment in this subsector around the city of São Paulo, covering the neighboring microregions of Santos, Itapeverica da Serra (furniture design in Embú das Artes), Sorocaba and Limeira (jewelry design). In addition, there are also enclaves close to other capitals, such as Florianópolis (Joinville), Porto Alegre (Gramado and Canela), Belo Horizonte (Divinópolis) and Curitiba (Ponta Grossa).

Figura 4: LISA Map for Employment in the Consumption Subsector of the Creative Economy, 2018

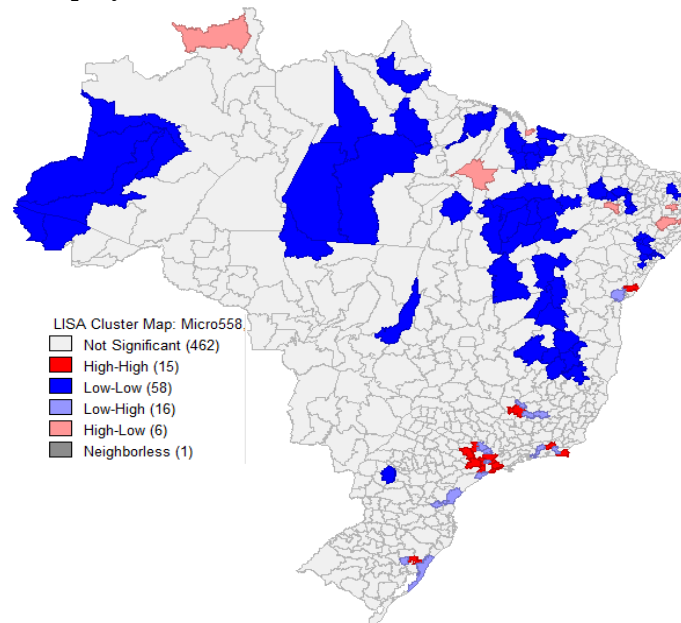


Source: MTE (2018) and authors elaboration.

Regarding the employment clusters in the Culture subsector (which includes handicrafts and cultural expressions, performing arts, music and heritage and the arts) of the Creative Economy (Figure 5), there is once again an extended agglomeration around the city of São Paulo, also covering neighboring microregions, such as Bragança Paulista, Itapeverica da Serra (important handicraft

hub), Santos (gastronomy cluster), Sorocaba, Piracicaba and Limeira. In addition, sparse agglomerations can be observed around some capitals such as Rio de Janeiro (mountain region and the Lakes region - crafts and gastronomy), Porto Alegre (Gramado and Canela - crafts), Belo Horizonte (Divinópolis) and Salvador (Catú - craftsmanship).

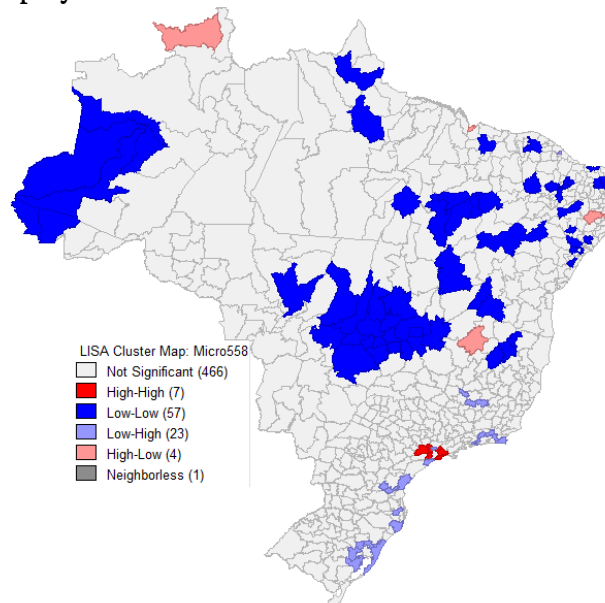
Figure 5: LISA Map for Employment in the Culture Subsector of the Creative Economy, 2018



Source: MTE (2018) and authors elaboration.

As for the spatial distribution of employment in the Media subsector (which includes editorial and audiovisual media) of the Creative Economy (Figure 6), there is an agglomeration around the metropolitan region of São Paulo, a result consistent with the concentration of employment in the media in the largest metropolis in the country.

Figure 6: LISA Map for Employment in the Midia Subsector of the Creative Economy, 2018

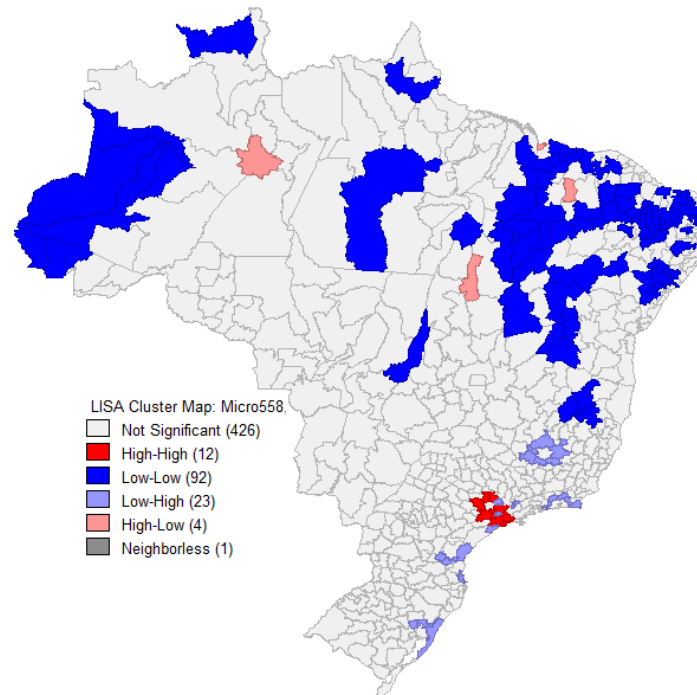


Source: MTE (2018) and authors elaboration.

Finally, with regard to the Technology subsector (which includes Research and Development - R&D – biotechnology, and Information and Communication Technologies - ICTs) of the Creative Economy (Figure 7), it appears that again there is a cluster in the region metropolitan area of São Paulo, given the concentration of universities and research centers in the region. Such agglomeration

extends to the microregions of Campinas and São José dos Campos, notoriously specialized regions that also house a vast contingent of universities, research centers and workers in information and communications technology companies.

Figure 7: LISA Map for Employment in the Technology Subsector of the Creative Economy, 2018



Source: MTE (2018) and authors elaboration.

Conclusions

The importance of the Creative Economy sector for economic growth has been manifested in the increasing attention to the topic, both in the academic and public policy spheres. On the one hand, there is an increasing role of economic activities involved in the origination, transmission and consumption of cultural and creative content (BERTACCHINI; BORRIONE, 2013). On the other hand, the use of public policies to promote the production of craft, design and technology goods and services is an attempt to recover and promote regional and local development (ANDERSON; MELLANDER, 2011).

In this context, this article seeks to present the spatial structure of the Creative Economy in Brazil, showing the geographic patterns of location of this sector. Using employment data for the year 2018 for the 558 Brazilian micro-regions, an Exploratory Spatial Data Analysis (ESDA) was prepared showing a map of geographic patterns by percentiles for the Creative Economy sector. Next, maps by clusters (LISA analysis) of employment were presented for the Creative Economy core sector, as well as for each of its four subsectors (Consumption, Culture, Media and Technology).

It was possible to observe that the microregions with jobs in Creative Economy in the percentile above 99% are those that concentrate the largest cities and metropolitan regions in the country, such as São Paulo, Campinas, Curitiba, Porto Alegre, Rio de Janeiro and Belo Horizonte. As for the employment percentile in Creative Economy between 90% and 99%, this is spread out in other regional capitals and metropolises, such as the capitals of the Northeast Region; Florianópolis, Joinville and Blumenau; regions of Serra Gaúcha and West of Paraná; some of the capitals of the Central-West and North Regions; Triângulo Mineiro and Juiz de Fora; and several microregions in the interior of the state of São Paulo.

As for the analysis of spatial agglomerations of Brazilian micro-regions (LISA analysis) for the total employment level in the Creative Economy sector as a whole, it was possible to observe a main cluster around the Metropolitan Region of São Paulo that extends to some neighboring micro-regions of the interior of the state. Smaller clusters were also observed around other regions of the country, such as Blumenau, Porto Alegre, Belo Horizonte and in the mountainous region of the state of Rio de Janeiro.

Regarding the LISA Analysis for the four subsectors (Consumption, Culture, Media and Technology) of the Creative Economy, it is noted that, for the Consumption subsector, there is an agglomeration around the city of São Paulo and some neighboring microregions, as well as enclaves close to other capitals (Florianópolis, Porto Alegre, Belo Horizonte and Curitiba. The same occurs for the Culture subsector, with an extended agglomeration around the city of São Paulo, and sparse agglomerations around some capitals such as Rio de Janeiro, Porto Alegre, Belo Horizonte and Salvador.

As for the Media subsector, there is an agglomeration around the metropolitan region of São Paulo, a result consistent with the concentration of employment in the media in the largest metropolis in the country. Finally, for the Technology subsector, there is again a cluster in the metropolitan region of São Paulo, an agglomeration that extends to the microregions of Campinas and São José dos Campos; such microregions are widely known for the specialization and concentration of universities, research centers and technology companies.

Regarding the general results, it is observed that, in line with results for other parts of the world (for example, BERTACCHINI; BORRIONE, 2013), employment in Creative Economy in Brazil tends to be concentrated in the main metropolitan regions, mainly in the metropolitan region of São Paulo. It is also observed that there are employment enclaves in regions neighboring the metropolitan regions, as in the consumption and culture subsectors, and in regions with the presence of universities and cutting-edge research centers, as in the technology subsector.

Finally, it is worth noting that this study helped to fill a gap in the literature on the spatial distribution of the Creative Economy in Brazil using a regional cut of Brazilian microregions. Such a study can be continued in several ways. First, other regional approaches (for Brazilian states or macro-regions, for example) can be used to analyze the sector. In addition, it is also important to prepare studies that point out the determinants of employment in the Creative Economy and its sectors in the Brazilian economy.

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