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Localisation and determinants of the creative class in the peri-urban areas. The case of Northern Italy

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ABSTRACT

This article analyses the Creative Class localisation and its determinants in the peri-urban areas of Northern Italy.

Florida's hypothesis on the localisation patterns of the creative class, based on the famous 3Ts (Talent, Technology and Tolerance), has been largely debated and sometimes discredited due to the shaky conceptual foundations of some of the variables on which it is based (e.g. the Gay Index) or the excessive focus on urban areas, which gave rise to worrying implications in terms of deepening socio-economic inequalities between urban and non-urban territories.

This paper seeks to deal with some of these limitations by reconsidering Florida's determinants as well as using new innovative means to define them. It also extends the analysis to a yet unexplored territory, the peri-urban areas, which occupies a third of the European territory and attracts creative people whilst still being closely integrated with urban economies.

These new hypotheses have been tested specifically by PCA and spatial regression models to the peri-urban municipalities in the regions of Northern Italy, the most creative regions in Italy. Here, the creative class results unevenly distributed as is greater in the municipalities closest to the urban centres and decreases in the ones furthest away. Its presence is strongly associated with socio-economic determinants (public expenditure, presence of creative and non-creative firms, volunteering), less to cultural amenities and technology. Tolerance has more controversial appealing affects.

1. Introduction

Research on the Creative Class has evolved rapidly over the past two decades.

Florida has been a key player in this research as he was the first scholar to define the 'creatives', (distinguishing the core, professional and bohemian creatives), and their determinants (the 3Ts: Talent, Technology and Tolerance) (2002, 2005, 2008). In his studies, he also observed their spatial concentration in urban areas, drawn from the local cultural climate and amenities, and technological development. Florida also explored the appeal of tolerance and openness towards minorities in terms of sexual preferences and geographical provenance as attracting factors in these territories. He examined how all these attitudes give the urban areas distinct advantages in creating innovation, which in turn attracts other creatives (individuals and firms) and high-tech industries, and spurring economic growth (ibid.).

Many aspects of these hypotheses have recently been re-examined. For example, Montalto et al. (2019) analysed the components of the creative class, while Mellander and Florida (2021) preferred investigating the relationship between creativity, human capital, and high-tech industries. Sleuwaegen and Ramboer (2020) studied the role of creative capital in generating economic growth. Li (2020) explored the contribution of creativity to urban development, while Cerisola (2018) detailed the factors explaining the localisation of the creative class. However, these studies have some flaws: reference to solely urban areas and limited consideration of other territories, underestimation of other determinants of creative class in addition to the 3Ts, and the failure to adopt a definition of tolerance based on the idea of acceptance, and even more, on one relating to integration.

Conversely, this paper aims to address all these areas.

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Firstly, it refers to a new territory, the peri-urban. Peri-urban is not a suburb, but a relevant and consolidated space that extends between urban and rural areas. Today, it occupies about one third of the European territory (EUROSTAT, 2018) and its features depend on a mix of spatial, economic, and social transformations. Creatives can shape this territory having an important role in creativity-led urban revitalisation and in promoting creativity, openness, and tolerance (Campbell et al., 2017). Nowadays, their presence is encouraged by their proximity to the city and thus the opportunity to benefit from the urban climate (Cattivelli, 2021b).

Secondly, the paper considers other localisation determinants, such as like job opportunities, services and amenities accessibility. These indicators are proposed and applied in the model as an alternative or a reformulation of the 3Ts.

Thirdly, instead of considering Florida measures of tolerance, like gay or melting pot indexes, it adopts new indicators such as civil unions and foreign-led active firms. This is because these indicators are a better representation of a new idea of tolerance, closer to the integration one, and has a more solid conceptual foundation than the previous ones.

Based on these assumptions, this study examines the presence of the creative class in peri-urban areas. It also assesses the importance of the 3Ts (as in the case of urban areas) and the increasing importance of other determinants (such as socio-economic context, civil unions, cultural amenities) in attracting this class to these areas. In other words, it attempts to answer these questions:

1. Is the creative class present in the considered peri-urban areas?
2. What role do the 3Ts and other additional determinants play in attracting the creative class?
3. In particular, how does tolerance defined by new indicators affect the presence of creative class?

The empirical analysis focuses on the peri-urban areas in the Northern regions of Italy. These regions were chosen because they are the most creative in Italy. The creative class represents more than half the sector's added economic value and creative occupation at national level (Symbola, 2019).

Although this category of professionals is particularly widespread, knowledge about its localisation and determinants is rather limited. Another reason is that these regions are the most peri-urbanised ones. Locally, peri-urban areas have grown rapidly a lot in recent decades and represent autonomous areas that are intricately connected to nearby urban areas, but also have typical rural elements (ISTAT, 2018).

Methodologically, the analysis uses the definition of creative class based on the industry affiliation and its interpretation in ATECO codes. It tests the determinants of the creative class and its localisation applying a principal component analysis and spatial regression models to the peri-urban municipalities identified through the implementation of the territorial classification method elaborated by OECD (2012).

The paper is structured as follows. The second section describes the theoretical background behind the composition of the creative class and localisation determinants, while the third section explains the adopted data and the quantitative model. The fourth section presents the results of the empirical analysis. The last sections discuss the results and include suggestions for future research.

2. Theoretical background

2.1. The definition of the creative class

According to Florida, the creative class "consists of people who add economic value through their creativity" (2002: p. 68). What characterises these people is the fact that they possess creative capital, which is defined as the "intrinsically human ability to create new ideas, new technologies, new business models, new cultural forms, and whole new industries that really [matter]" (Florida, 2005, p. 32).

With this, Florida proposes a broad definition of creativity: originality is undoubtedly included, while artistic and cultural components are not the only considered drivers. Consequently, he distinguishes different categories of creatives: the *creative core* (i.e., people who develop new technologies or ideas or work as engineers, architects, or teachers), *creative professionals* (i.e., people who can solve problems that require extensive analysis or have a high level of education and work in the fields of medicine and finance) and *bohemians* (i.e., people engaged in artistic and cultural activities).

This definition of "creatives" and their subsequent distinctions are referred to extensively in this paper: however, there is a disagreement over how to apply them because of their debatable conceptual descriptions.

The first issue concerns the definition of creative professions. Asheim and Hansen (2009) categorises the CC within groups of types of knowledge production or qualification levels, rather than by professions as Florida does. As such, they exclude 'creatives' with lower levels of education and seniority and associate the creativity concept to the 'human capital' assumption based on educational attainment rather than to occupation (Glaeser, 2005). To address these exclusions, (Boschma and Fritsch, 2009) examine skill content and work process characteristics, while McGrahanan and Wojan (2007) reformulate the definition of Florida by excluding some categories of workers, such as those working in agriculture, business, and all educational occupations. Although they use skill content-oriented definitions, none of these authors offer a clear distinction between human and creative capital.

The second problem is related to the fact that Florida's definition does not take into account the 'creatives' affiliation to industry. To remedy this, Freeman (2004) introduces the concept of creative intensity, defined as the proportion of workers in a given creative industry who are employed in a creative occupation. However, the proposal is questionable because it relies on three elements (definition of creative industries, occupation, and clarification of the threshold for workers) that must be determined *a priori* by the researcher. Later, Deroin (2011) brings together cultural professions and activities and assumes that total cultural employment in the economy includes employment in all cultural activities and cultural jobs in non-cultural activities. This evaluation is performed by using two classifications (NACE - *Nomenclature statistique des activités économiques dans la Communauté européenne,* which classifies the main activity of the employer, and the ISCO - International Standard Classification of Occupations, which classifies occupations). Since they are based both on industries and occupations, Freeman and Deroin's definitions differ from those of Florida and most other industry-based classifications, including the SIC - Standard Industrial Classification system itself, as well as those of Lorenzen and Andersen (2009) and Flew (2012), which define only creative industries. However, when considering all workers within the selected creative sectors, these latter three definitions still do not clearly distinguish between creative and non-creative workers.

Recently, NESTA (2013) has addressed these problems (lack of a clear definition of creative professions on the one hand, and the definition of creative industries on the other) and adopted its own definition of creative profession, based on a combination of original considerations: all creative skills that are more or less strongly associated with problem solving - with processes defined by collaborative relationships to deliver or realise the outcome. On this basis, NESTA uses the term creative occupation as defined by the UK government, dividing it into a set of five criteria (novelty of the process, resistance to mechanisation, non-repetitive output, creative function in the process, interpretation rather than transformation) and scoring them. After this process, it applies these grid-generated occupations to create a new list of creativity intensities for the different industries. Using this new occupational definition, it divides all SIC codes into two groups based on the industry selection chosen by the UK government.

2.2. The determinants of creative class localisation

The localisation-based determinants that impinge on the CC presence are numerous. Florida's 3Ts (Tolerance, Technology, and Talent) are still considered important attraction factors. However, they are largely disputed and sometimes discredited due to the shaky conceptual foundations of some of the variables on which they are based.

The most debated "T" is tolerance.

Some relatively recent studies confirm that regions with high levels of tolerance of diversity are most likely to attract the creative class (e.g., Borén & Young, 2013), as openness to diverse groups of people from different backgrounds increases social vibrancy, breaks down barriers and promotes integration (Li et al., 2016). This, in turn, attracts other talented individuals in high technology industries, creative and non-creative industries and provides advantages in generating innovation and spurring local economic growth (Kemeny, 2017). This happens for any form of diversity, including heterogeneity of lifestyle, ethnicity, and sexuality (Bereitschaft & Cammack, 2015). On the other hand, other studies do not confirm these assumptions and demonstrate that creativity seems to be less related to tolerance (Vossen et al., 2019) and specifically to the presence of foreigners and gays (Baez et al., 2014) or has a controversial impact on economic growth (Haisch & Klopper, 2014).

Some doubts also exist regarding the measurement of this "T". There is no consensus on the measurements made by Florida (2002), such as the gay index (percentage of gay households) and the melting pot factor (percentage of foreigners in a household), especially because of methodological difficulties, including the lack of data for privacy reasons.

Regarding to the other 'Ts", Florida (2016) underlines their importance in stimulating creativity, attracting new 'creatives', and generating high-technology industries, assessing and capitalising upon the existing creative capital. However, his proposal to measure talent with the degree of education or the number of regional universities tends to be better than representing human capital when calculating regional development (Glaeser, 2005). Similarly, his idea of considering the number of patents as a good representation of technology has some limitations, since relative data are obtained only at the regional level. Indeed, at a lower territorial level, these data are not measured and must be replaced by other indicators (e.g., the number of firms specialising in high technology) (Corrado et al., 2005).

More recently, there is a growing group of scholars arguing the importance of other location factors in attracting the creative class: cultural and natural amenities (e.g., Ling & Dale, 2011; Mansury et al., 2012; Wedemeier, 2015), housing affordability (Lawton et al., 2013), and quality of life (Van Oort et al., 2003). Others point to the relevance of employment opportunities, the presence of other 'creatives' (especially bohemians, such as Boschma & Fritsch, 2009), or clusters of 'creatives" in firms (e.g., Boix et al., 2014; Martin-Brelot et al., 2010). Florida himself states in a recent book that "[…] enduring success in the new people-driven, place-based economy turned on doing the smaller things that made cities great places to live and work-things like making sure that were walkable, pedestrian-friendly streets, bike lanes, parks, exciting art and music scenes, and vibrant areas where people could gather in cafés and restaurants. Cities needed more than a competitive business climate; they also needed a great people climate that appealed to individuals and families of all types-singles, married, with children or without, straight or gay" (Florida, 2017, p. 5, preface).

2.3. Why could peri-urban areas attract the creative class?

For a long time, studies of creativity have been carried out in urban settings, because so-called Florida's urban climate, i.e., the vibrant atmosphere that fosters diversity, openness, and cultural vitality, is found only in urban areas and less (or not at all) in other surrounding areas. In this regard, Florida has recently written: "These areas are the basic platform for attracting talent, for matching people to jobs, and for spurring innovation and economic growth" (Florida, 2017, p. 4 preface).

Recently, a limited number of articles have expanded their focus to peri-urban areas and demonstrated the presence of some potential local attraction factors for creatives (e.g., Escalona-Orcao et al., 2016; Petrov & Cavin, 2017; Roberts & Townsend, 2016).

Peri-urban areas are not suburbs, but interconnected continuum between urban and rural areas extending beyond urban boundaries and administrative ones (e.g., Hoggart, 2016; Wandl & Magoni, 2017). Since they are the result of the conversion of rural areas around urban ones into urbanised territory, peri-urban areas contain a wide variety of land use, which is expressed in a highly fragmented collection of productive and residential frameworks connected with infrastructural networks and separated by empty agricultural spaces or residual ones (Wandl et al., 2014). The main cause of their formation is the migration from urban areas (e.g., Mortoja et al., 2020). However, other factors are equally important: commuting and investment in infrastructure (Cattivelli, 2021b), industrialization and changing location preferences for some service functions (Rovai et al., 2014), and different people's housing preferences, housing dispersion, and housing market development (Plantinga et al., 2013). Local economic and social structures are strongly intertwined with those of neighbouring urban areas (Cattivelli, 2022; Monsson, 2013). Peri-urban areas assume significance as a place for relocated firms which take advantage of the interconnection with infrastructural hubs and lower congestion costs. It is relevant for some population categories, like families or migrants, who can afford to less expansive housing-family properties without renouncing the advantages of quick access to public services or job offers in urban areas thanks to the same interconnections. Industries and population density are lower than in urban areas, but lower than in rural areas. As a result of these causes, peri-urban areas occupy a large part of the European territory (about 35.4% according to an estimate by EUROSTAT (2018)).

There are several reasons that encourage the creative class to move here.

Firstly, peri-urban areas are close to urban centres. This proximity allows peri-urban residents and businesses located there to access urban services and benefit from the urban economies without having to bear the costs of congestion. This condition supports peri-urban economies, whose outputs are functionally integrated with urban ones by attracting firms in the same urban value chains and generating consistent commuter flows (OECD, 2018; Stolarick, 2012). Recent infrastructure investments and smart policies in these areas have further reduced economic distances and expanded daily commuting areas, facilitating people's access to urban areas (Cattivelli, 2021a).

Secondly, many service-oriented firms have relocated here, including creative businesses. This has had two effects. The first relates to the preferential location of the creative class, as it is favourable to locate where creative firms are present (Bakhshi et al., 2014). The second effect is related to the attraction of firms operating in the same sectors ("creative cluster effect," Wu, 2005).

Thirdly, this relocation in turn fosters vertical (with other creative and non-creative firms/individuals) and horizontal (among 'creatives') relationships that strengthen integration with neighbouring urban areas (Felton, 2010). These connections are not 'urban-centric' but 'hub-and-spoke' and their geography disrupts the simple concentric circle models in which creativity declines with distance from urban centres (Gibson, 2012). Another reason is that the creative class is not as mobile as Florida suggests. Cultural and institutional constraints such as cultural barriers, less openness to foreigners, and bureaucratic obstacles contribute to lower mobility rates. According to Martin-Brelot et al. (2010), the creative class remains "regionally connected," preferring places where it was born, has already studied or worked, or from which it can easily travel home to live on a daily or weekend basis. Even more than long-distance national migration, the creative class prefers short-distance mobility or physical presence in their reference market or work environment. This does not prevent them from developing extensive personal networks, including many international contacts

(ibid.). In this sense, moving to areas close to cities allows the creative class to remain regionally connected. Another attractive factor is the possibility of shaping peri-urban areas according to the principles of creativity-led urban renewal.

As these areas are the result of ongoing changes between urban and rural areas, they represent a blank canvas that can be adapted to the needs of the inhabitants, with creative solutions possible. The last motivations concern the search for a better quality of life away from the high rents and congestion of urban areas.

3. Data and methods

This section defines peri-urban areas and creative class. It also explains the adopted variables and the quantitative model.

3.1. The identification of Peri-urban areas

Peri-urban is not a well-defined statistical or administrative unit of reference. The spatial, social and economic dynamics that is required upon territories at this moment prevent the adoption of a unique definition. Among the over forty existing definitions (Cattivelli, 2021c), we have decided to choose the one that satisfies two criteria simultaneously.

Firstly, since 'peri-urban' extends beyond administrative boundaries, we consider only definitions referring to the lowest administrative level, such as the municipal one. Others based on the regional level do not adequately represent the diversity required in these territories due to their excessive extension. Other more precise units, such as the grid, are preferred; however, at this level, only demographic data is available while others like economic and social ones are unfulfilled.

Secondly, we prefer only definitions that evidence functional relationships among territories as peri-urban areas are strongly integrated or influenced by close urban ones.

Few definitions of peri-urban areas meet these requirements. Among these, there are those developed by the OECD for the functional areas' delimitation (OECD, 2012). Based on two variables (population density and travel-to-work flows), OECD divides the urban territories into two categories: the 'core area' and the 'hinterland'. The core area includes urban municipalities with the highest population density and commuter in-flows. The hinterland encompasses the municipalities with less density and commuter attractiveness but integrated to the nearest core. OECD classification defines the remaining territories as non-urban. In our study, we adopt this definition as coherent with the quoted requirements and because it enables us to assume the 'core areas' as the 'urban areas', and the 'hinterland areas' as 'peri-urban areas'.

3.2. The definition of creative class

In this study, we adapt Florida's definition of the CC to the industry affiliation approach as the data related to the workers and firms at municipal level are available in the ATECO dataset (based on economic sectors distinction[1]). We cannot use other approaches (professional-based and NESTA) as the data related to professions are not available at municipal level. As such, we start identifying the most creative sectors among all ATECO sectors. As core creative sectors, we select the information and communication services (Sector J), professional, scientific, and technical activities (Sector M) and education (Sector P). With respect to the professional creative sector, we consider the following sectors: Health and Social care (Sector Q), Financial and insurance activities (Sector K) and Real Estate activities sectors (Sector L). The bohemian sector is identified within the artistic, sports and entertainment activities sector (Sector R). Within the sectors identified as creative, we cannot separate 'creatives' and 'non-creatives' and we assume 'creatives' as all workers who operate within them. Accordingly, we consider creative core individuals as all professionals that operate in the creative core sectors. We identify creative professionals as individuals who work in creative professional sectors, while we assume that bohemians are professionals included in the bohemian sector. Consequently, the indicators of creative individuals are the number of the professional creatives (PROFCREA), as well as those of the creative core (CREACORE) and bohemians (BOHECREA). Their sum is the 'creatives', i.e., TOTCREA. These last four indicators are estimated as dependent variables.

[1] ATECO codes in Italy are the equivalent of NACE codes at European level.

3.3. The selected creative class localisation determinants

The selection of localisation determinants reflects the literature review and is determined by data availability. We consider only indicators related to the municipal level, since peri-urban areas do not exist as statistical territorial units and higher administrative levels cannot explain their specificity (Table 1). Let us first specify the 3Ts.

We propose three indicators to represent tolerance. The first indicator concerns the number of active foreign-owned enterprises (FORFIRM), i.e., enterprises in which the share of foreign entrepreneurs or foreign ownership in the enterprise capital exceeds 50%. We prefer this indicator to the melting pot index because it gives an indication of the long-term integration of people with foreign backgrounds into society. The second type of indicator refers to the heterogeneity of lifestyle, ethnicity, and sexuality. The Gay Index is not covered by the Statistical Office because it concerns the sexual preference and therefore people's intimacy. Moreover, this indicator does not adequately represent the distribution of homosexual couples. Considering people of the same sex who live together, it also includes roommates who are not in a romantic relationship (friends, relatives, colleagues, etc.). Instead, we consider at the number of Civil Unions (CIVILUNION). Civil union is the term used in Italian law to refer to a couple composed of two people of the same sex and legally recognised. Their number is an acceptable measure of tolerance, as it reflects the social acceptance of homosexual couples and their freedom or right to formalise their union. However, these data are not yet freely available in public datasets. Since this indicator is considered particularly controversial in many studies (as outlined by Baez et al., 2014 and Vossen et al., 2019), we decided to test it specifically for our peri-urban areas and then to collect data directly from municipalities. The last indicator concerns openness and acceptance of diversity through solidarity and can be represented by the high number of non-profit institutions and volunteers (NOPROFITIST; NOPROFITVOL). These indicators reinforce the relevance of commitment of the local society to overcome possible social inequalities.

As a measure of talent, we consider the number of volunteers in cultural and creative activities (VOLUNTCREA). Existing literature demonstrates great difficulties in measuring talent accurately, reflecting the lack of theoretical basis for identifying talent (Nijs et al., 2014). Florida (2002) values it by considering education as a good measure. However, this hypothesis is too general and creates confusion about the notion of human capital, which is sometimes represented by the same indicator. Moreover, data on the education of skilled workers is not available at the municipal level. After careful consideration, Nijs et al. (2014) concluded that talent is determined by four components (intrinsic abilities, systematic development, motivation, and interests) and that it is transformed into excellence when these components are added to interpersonal and intrapersonal relationships. There are no data measuring these components or the workers who possess them - econometrically, the number of creative people and their subdivision into the three known categories cannot be considered as a representation of talent, as the relative indicators are assessed as dependent variables in our study. Therefore, talent could be evaluated by volunteers in the creative and cultural sector, as having strong motivations and interests in working in favour of the community for free and are frequently involved in interpersonal and intrapersonal relationships. Some of the literature ignores this part of creatives, the importance of volunteering in attracting new talent or stimulating the expression of talent of existing

Table 1
The determinants of Creative Class location.

Localisation determinants and their specifications	Indicators	Acronym	Source
Tolerance/ Integration - Foreign entrepreneurships	Total foreign-led active firms out of total active firms, March 2020	FORFIRM	Movimprese, 2020
Tolerance - Openness to Same-sex couples	Number of Civil Union, 2017–2020	CIVILUNION	Direct investigation, 2020
Tolerance-Attention and acceptance of different people in need of help or social, cultural and environmental causes towards which the community shows interest and attention	Number of active non-profit institutions with volunteers (active local units), 2011	NOPROFITIST	ISTAT census 2011
Tolerance-Attention and acceptance of different people in need	Number of volunteers in non-profit institutions with volunteers (active local units), 2011	NOPROFITVOL	ISTAT census 2011
Talent[a]	Professional creative individuals, March 2020	PROFCREA	Movimprese, 2020
Talent[a]	Creative core individuals, March 2020	CORECREA	Movimprese, 2020
Talent[a]	Bohemian individuals, March 2020	BOHECREA	Movimprese, 2020
Talent[a]	Total creative individuals, March 2020	TOTCREA	Movimprese, 2020
Technology	Employees in high technology sectors on total occupation (%), 2015	HIGHTECH_EMP	ISTAT (2018)
Cultural amenities	Allocation of cultural heritage resources (Number of cultural assets), 2017	CULTAMEN	ISTAT (2018)
Provision of services/ Public expenditure	Public Expenditure at municipal level, 2016	TOTALEXPE	Opencivitas, 2019
Net migration as proxy of Attractiveness/ Attraction index	In- and out-movement of population from other municipalities, 2015	NET_MIGRATION	ISTAT (2018)
Economic performance/Local economic conditions	Number of firms without creative firms, March 2020	NFIRM	Movimprese, 2020
Attractiveness/ Creative's firms agglomeration	Total Creative firms, March 2020	TOTCREAFIRM	Movimprese, 2020
Attractiveness/ Creative's firms agglomeration	Creative professional firms, March 2020	PROFFIRM	Movimprese, 2020
Attractiveness/ Creative's firms agglomeration	Creative core firms, March 2020	COREFIRM	Movimprese, 2020
Attractiveness/ Creative's firms agglomeration	Bohemian firms, March 2020	BOHEFIRM	Movimprese, 2020
Urban climate (Vibrant atmosphere)	Population density, 2020	POPDEN	ISTAT, 2020
Urban climate (Vibrant atmosphere)	Distance from the main important close urban center, 2020	DISTANCE	ISTAT, 2020

[a] As specified in the text, this variable cannot use as proxy of talent in the regression model as it is considered already as dependent variables.
Source: own elaboration, based on several authors, 2020.

"creatives" and only considers "creatives" as people with an employment or economic contract. In contrast, our study aims to explain this meaning and considers this part of creatives.

As a measure of technology, we consider the employees in high-tech sectors as a percentage of total employment (%) (HIGHTECH_EMP). As for cultural amenities, we look at cultural heritage resources (CULTAMEN). We have not considered natural amenities as no data is available at the municipal level.

We aim to explain local economic conditions in terms of three different types of indicators. The first indicator is the quality of life and is represented by public expenditure incurred in service provision (TOTALEXPE) (Annoni & Weziak-Bialowolska, 2013). The role of quality of life as an attractive factor for the creative class has been studied for urban and rural areas, but never for peri-urban areas. The second group refers to the general attractiveness of a territory, measured by the inflow and outflow of residents from other municipalities (NET-MIGRATION) and the number of non-creative firms (NFIRM), as a good representation of the capacity of a territory to generate added economic value, create new jobs and attract new residents. The last group includes TOTCREAFIRM (i.e., the sum of creative core, creative professionals, and bohemian firms; in other words, COREFIRM; PROFFIRM; BOHEFIRM), which measures the agglomeration of creative firms, which is an important attraction factor, as noted by Bakhshi et al. (2014).

Finally, we consider population density (POPDEN) as a "catch-all" variable and representation of the urban climate, as outlined in Boschma and Fritsch (2009). However, this indicator only partially explains this environment, as it only refers to population and not to cultural facilities and their accessibility. Therefore, we also consider the distance of peri-urban municipalities from the nearest urban centres in minutes (DISTANCE) to measure the accessibility of the urban climate and its amenities, as well as the intensity of urban/peri-urban relations, as indicated by Felton et al. (2010).

3.4. The adopted quantitative model

This section describes the quantitative model that has been implemented to elaborate the evidence of literature and data, and to improve the understanding of how drivers locate the creative class.

The first phase is devoted to the distribution of the indicators, as explained previously. As such, principal descriptive statistics and the Gini index have been calculated for the whole set of peri-urban municipalities and then respectively to the different regions.

In the second phase, Principal Component Analysis (PCA) is carried out to reveal different factors based on the existing correlations between the localisation determinants, thus reducing the number of indicators.

In the third phase, a spatial regression analysis is carried out for the whole set of the peri-urban municipalities to explore the relationship between the presence of different types of 'creatives' and the localisation determinants. The same procedure is then performed for each region, taking into account the corresponding peri-urban areas.

Spatial regression models are preferred to traditional regression models. This is because the latter assume mutual independence of observations, which is not the case when analysing spatial data. Conversely, spatial regression models assess spatial dependence and help avoid the problems of unstable parameters and unreliable significance tests. In this study, the issue of dependency is more difficult because the municipalities are interdependent when we consider a peri-urban area in a region, but they can otherwise be considered independent. To deal with this situation, the list of geographical coordinates is converted into a spatial object and a spatial weighting matrix is created based on the distance between k nearest points (in this case $k = 3$).

To examine the relationship between the outcome variable and a set of predictors, four regression models are evaluated: Ordinary Least Square (OLS), the Spatial Lag Model (LAG), the Spatial Error Model (SEM) and the Spatial Durbin Models (SDM). In each regression model, deviations and influential points are determined by calculating leave-one-out deletion diagnostics. The set of models are run twice; the first time is based on overall considered points while the second takes place after removing the deviation and influential points. The spatial autocorrelation of the residuals is tested by using the Lagrange Multiplier test. After validation of the autocorrelation, the model in which the residuals are not correlated is adopted. The results of the log-likelihood ratio and the AIC are used to evaluate the goodness of fit of the model and to select the best fitting model. Only the best models are listed in the results tables.

3.5. The study area

We test our model in the peri-urban municipalities in the regions of Northern Italy. These regions are the most creative regions in Italy (Symbola, 2019). Together, they account for 57.9% of the sector's added economic value and 56.1% of creative occupation at national level (ibid.). Considering all economic sectors, they account for 5.7% of regional added economic value and 6.31% of creative employment on average. These regions have been affected by an intensive process of land conversion for production and housing purposes, blurring the boundaries between urban and rural areas, and creating peri-urban areas (ISPRA, 2018).

This collapse is the result of an intensive urbanisation process that has accelerated considerably in the last fifty years. The countryside only became urbanised later, whilst the residential, industrial, and service buildings poured into areas away from the most densely populated cities, in smaller urban centres or rural municipalities near larger urban areas. According to ANCI (2018), 1000 of Italy's 8000 municipalities grew demographically by more than 160% between 1971 and 2019. Of these, around 700 are located in the regions under consideration. Their spatial distribution underlines a shift of part of the urban population: towards smaller municipalities on the one hand, and towards the countryside on the other, affecting the expansion of peri-urban areas around the main urban centres (Caracciolo, 2018; Esposito et al., 2018). Conversely, population growth in urban centres was found to be stable or even negative over the same period (ibid.).

Applying the OECD definition (2012), we distinguish the municipalities of northern Italy into urban and non-urban municipalities. Then, within the primary municipalities, we define the core urban municipalities and the hinterland municipalities, which we consider urban and peri-urban, respectively. Consequently, all provincial capitals are urban municipalities, with the exception of Milan. In addition to the city of Milan, the nearest 167 municipalities are also considered urban. In Peri-urban municipalities are 914 in total and are located near to the urban ones, as shown in Fig. 1.

4. Results

4.1. Mapping of 'creatives' in peri-urban municipalities

Generally, the creative class is present, but unevenly distributed in peri-urban municipalities (Fig. 2; Table 2). Their presence is greater in

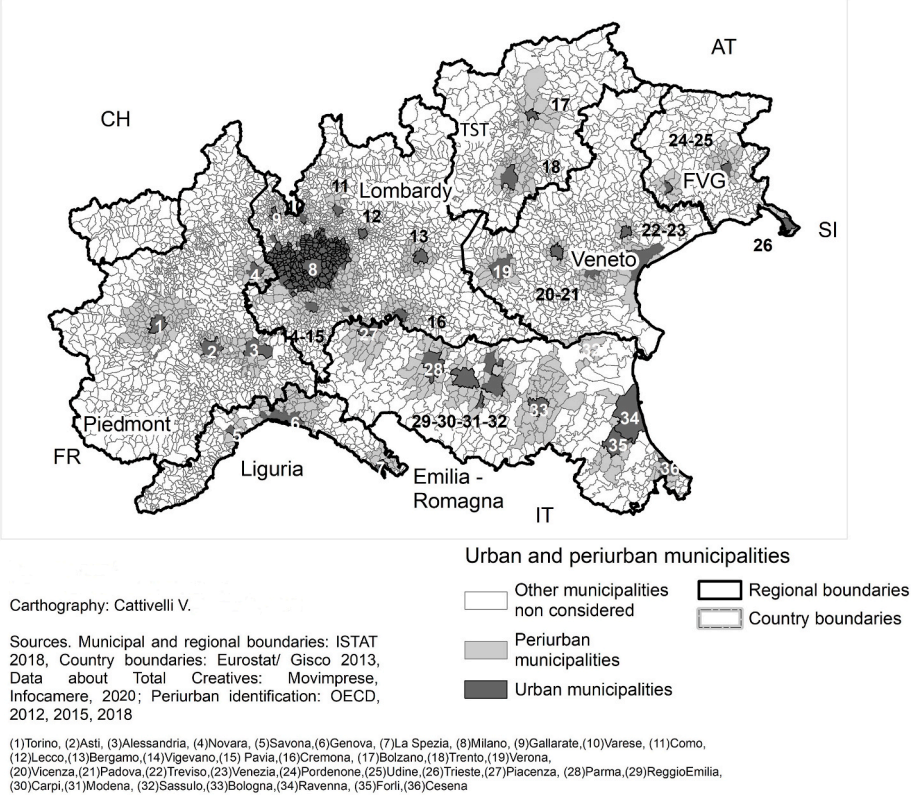

Fig. 1. Urban and peri-urban municipalities in the Northern Italy.

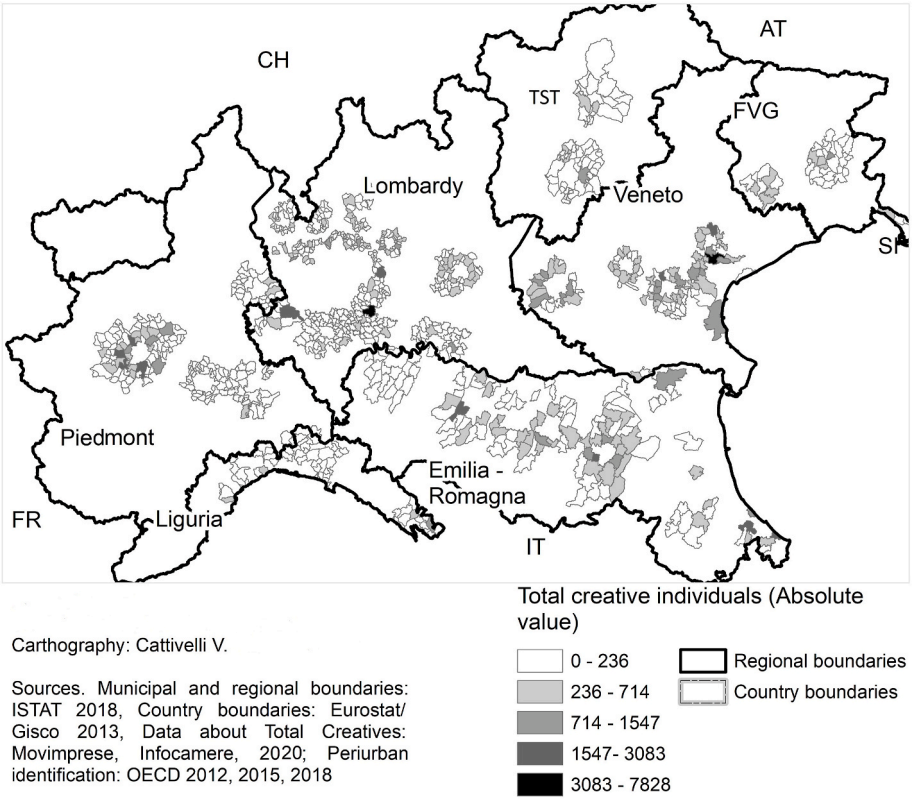

Fig. 2. Total creative individuals for each peri-urban area in Northern Italy.

the municipalities closest to the urban centres and lower in those furthest away (Spearman's rho correlation: −0.154, p-value = 0.000). Milan's peri-urban area is highly creative: it is spatially very close to the rest of the Lombardy peri-urban areas and its influence extends beyond the regional borders. Between Milan and Ravenna, there is the largest creative class concentration. The peri-urban area around Turin is strongly creative, but its influence does not extend to the rest of the region. In Veneto, the creative class forms a kind of 'creative zone' from Verona to Venice. Trentino - South Tyrol's (TST) peri-urban area is less creative than other regions. In Friuli Venezia Giulia (FVG), the peri-urban areas of Udine and Pordenone are more creative than that of Trieste.

Compared to the respective urban centre, each peri-urban municipality is independently less creative (Fig. 3, based on geometrical intervals). In the case of Emilia-Romagna, Friuli Venezia Giulia, Trentino-South Tyrol and Veneto, the sum of creatives in the peri-urban areas is higher than the total of those located in the urban centres of reference.

The analysis of each category of creatives demonstrates a clear preponderance of professional creatives over other types, followed by the creative core. The number of bohemians is significantly lower (Figs. 4–6).

Professional creatives are present in all municipalities, especially in those nearer to the largest urban areas (Fig. 4). Even in the smallest municipalities, their presence is significant and higher than other creatives. Peri-urban municipalities in Lombardy, Veneto and Emilia-Romagna are the most professional-oriented (Table 2). Liguria and Trentino- South Tyrol, the least.

Creative core individuals demonstrate a similar spatial pattern to professional creatives (Fig. 5). Their presence is very concentrated in both the peri-urban municipalities closer to the urban centres and to the most remote ones. This occurs in all the peri-urban areas considered, both the larger and smaller ones. Emilia-Romagna and Veneto have some of the most core creative oriented peri-urban areas.

The Bohemians demonstrate a different spatial pattern (Fig. 6). In all peri-urban municipalities, their number is lower compared to the rest of the "creatives'. Larger municipalities and those closer to the city centre are more attractive to them. In the peri-urban areas near the major urban centres (Milan, Turin, Bologna, Venice) their number is the highest. The peri-urban areas of Bozen (in Trentino – South Tyrol) and Trieste (in Friuli Venezia Giulia) differ from the other peri-urban areas in their region by their high values.

In terms of distribution, the high values of the Gini indices show the willingness of the 'creatives' to concentrate spatially, at least at the regional level. However, there are some differences between regions. In Emilia-Romagna and Friuli Venezia Giulia, the "creatives' are more dispersed in the regional peri-urban areas, while in the other regions they are more integrated and concentrated in the respective peri-urban areas.

Regarding the distribution of each creative category, professional creatives have the highest Gini index among the entire category of creatives (0.71). However, this is not the case in all regions. In some of them, creatives are barely distributed in peri-urban areas (Trentino-South Tyrol 0.78; Piedmont 0.77), while in other regions the distribution gap is wider (Emilia-Romagna 0.58; Friuli Venezia Giulia 0.61). Creative core professionals have the lowest values of the Gini index: this underlines their dispersion across the regional territory and is related to the presence of highly creative municipalities close to less creative ones. Inequalities in territorial distribution are also evident in relation to these creatives. Despite the north-south divide, Lombardy shows a high degree of concentration. In Trentino - South Tyrol, these creatives are also highly concentrated (0.73). Bohemians are the most concentrated creatives. The relative Gini index is highest in Liguria and Piedmont (above 0.8) (Table 2).

4.2. *The influence of different localisation determinants*

The descriptive statistics on the localisation determinants (Table 3) demonstrate different results from those on the 3 'T's and the additional

Table 2
Total values and GINI index for creative professional (PROFCREA), creative core (CORECREA), bohemians (BOHECORE) and total creatives (TOTCREA) for all considered urban (U) and peri-urban (PU) areas in each region.

		PROFCREA	CORECREA	BOHECREA	TOTCREA
Emilia - Romagna	Bologna (U)	4908	4231	444	9583
	Bologna (PU)	5595	7875	636	14,106
	Carpi (U)	848	538	76	1462
	Carpi (PU)	176	98	7	281
	Ferrara (U)	1240	956	199	2395
	Ferrara (PU)	1826	495	170	2491
	Forlì (U)	1159	760	174	2093
	Forlì (PU)	1175	371	80	1572
	Modena (U)	2399	1919	242	4560
	Modena (PU)	2108	1709	327	4144
	Parma (U)	2175	1952	230	4357
	Parma (PU)	1539	3043	221	4803
	Piacenza (U)	1087	873	151	2111
	Piacenza (PU)	550	860	204	1614
	Ravenna (U)	1289	918	368	2575
	Ravenna (PU)	218	190	55	463
	Reggio Emilia (U)	1861	1645	278	3784
	Reggio Emilia (PU)	1357	986	359	2702
	Rimini (U)	1983	1127	422	3532
	Rimini (PU)	2687	2402	1618	6707
	Sassuolo (U)	551	386	33	970
	Sassuolo (PU)	944	523	48	1515
	Total (U)	**19,500**	**15,305**	**2617**	**37,422**
	Total (PU)	**18,175**	**18,552**	**3725**	**40,398**
	Gini Index (PU)	**0.58**	**0.66**	**0.75**	**0.59**
FVG	Pordenone (U)	608	586	74	1268
	Pordenone (PU)	1269	1094	115	2478
	Trieste (U)	1095	1211	202	2508
	Trieste (PU)	1164	355	67	1586
	Udine (U)	1241	1253	131	2625
	Udine (PU)	1705	1899	184	3788
	Total (U)	**2944**	**3050**	**407**	**6401**
	Total (PU)	**4138**	**3348**	**366**	**7852**
	Gini Index (PU)	**0.61**	**0.54**	**0.53**	**0.52**
Liguria	Genova (U)	5151	3934	597	9682
	Genova (PU)	1050	568	221	1839
	La Spezia (U)	643	523	91	1257
	La Spezia (PU)	1015	846	237	2098
	Savona (U)	491	385	107	983
	Savona (PU)	254	280	251	785
	Total (U)	**6285**	**4842**	**795**	**11,922**
	Total (PU)	**2319**	**1694**	**709**	**4722**
	Gini Index (PU)	**0.70**	**0.75**	**0.82**	**0.69**
Lombardy	Bergamo (U)	2852	2041	255	5148
	Bergamo (PU)	3302	3184	383	6869
	Brescia (U)	3482	2958	353	6793
	Brescia (PU)	5310	3530	499	9339
	Como (U)	1541	929	115	2585
	Como (PU)	1118	1030	112	2260
	Cremona (U)	631	491	119	1241
	Cremona (PU)	1588	206	113	1907
	Gallarate (U)	1052	460	69	1581
	Gallarate (PU)	520	364	40	924
	Lecco (U)	746	500	51	1297
	Lecco (PU)	1681	621	99	2401
	Milano (U)	53,171	48,822	4477	106,470
	Milano (PU)	14,903	11,654	1453	28,010
	Pavia (U)	825	554	93	1472
	Pavia (PU)	929	344	124	1397
	Varese (U)	1365	699	107	2171
	Varese (PU)	1460	960	251	2671
	Total (U)	**65,665**	**57,454**	**5639**	**128,758**
	Total (PU)	**30,811**	**21,893**	**3074**	**55,778**
	Gini Index (PU)	**0.70**	**0.73**	**0.74**	**0.68**
Piedmont	Alessandria (U)	926	502	108	1536
	Alessandria (PU)	614	153	25	792
	Asti (U)	779	443	81	1303
	Asti (PU)	329	103	56	488
	Novara (U)	1059	898	115	2072
	Novara (PU)	390	306	83	779
	Torino (U)	15,006	10,193	1209	26,408
	Torino (PU)	10,156	13,803	1243	25,202
	Total (U)	**17,770**	**12,036**	**1513**	**31,319**

(*continued on next page*)

Table 2 (*continued*)

		PROFCREA	CORECREA	BOHECREA	TOTCREA
	Total (PU)	**11,489**	**14,365**	**1407**	**27,261**
	Gini Index (PU)	**0.77**	**0.86**	**0.85**	**0.80**
TST	Bolzano (U)	1122	1278	131	2531
	Bolzano (PU)	1017	882	264	2163
	Trento (U)	1075	1274	112	2461
	Trento (PU)	1654	1869	145	3668
	Total (U)	**2197**	**2552**	**243**	**4992**
	Total (PU)	**2671**	**2751**	**409**	**5831**
	Gini Index (PU)	**0.78**	**0.73**	**0.80**	**0.72**
Veneto	Padova (U)	3446	2957	276	6679
	Padova (PU)	7289	6169	630	14,124
	Treviso (U)	1678	1086	131	2895
	Treviso (PU)	2138	3852	343	6333
	Venezia (U)	2244	1831	291	4366
	Venezia (PU)	10,749	3308	617	14,674
	Verona (U)	2900	2457	358	5715
	Verona (PU)	4753	3047	654	8454
	Vicenza (U)	1695	1254	127	3076
	Vicenza (PU)	2349	1476	329	4154
	Total (U)	**11,963**	**9585**	**1183**	**22,731**
	Total (PU)	**27,278**	**17,852**	**2573**	**47,739**
	Gini Index (PU)	**0.59**	**0.56**	**0.63**	**0.54**

Source: own elaboration based on several data, 2020.

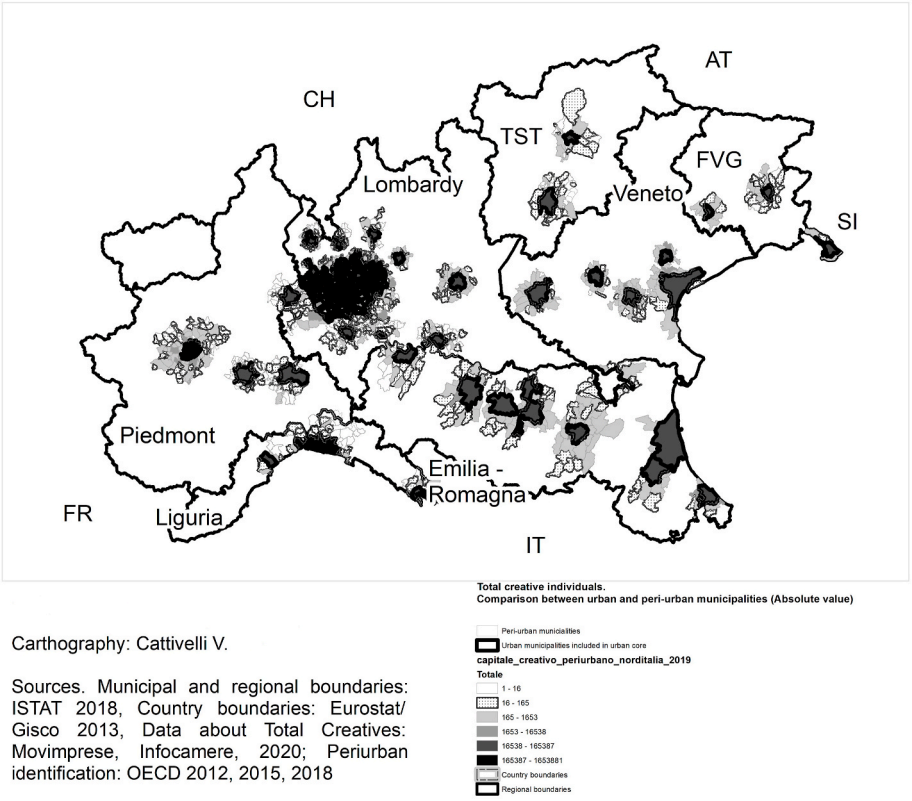

Fig. 3. Total creative individuals in urban and peri-urban municipalities.

attractiveness variables. In particular, for the T representing Tolerance, Emilia-Romagna peri-urban areas are the most tolerant, as the relative indicators for FORFIRM & CIVILUNION take the highest values. In Liguria and Lombardy, the peri-urban areas show the highest values of foreign-led active firms, while in Friuli Venezia Giulia these firms are less present in the regional peri-urban areas. Civil unions are less frequent in Lombardy and Trentino - South Tyrol peri-urban areas. Regarding the T which stands for Talent, all peri-urban municipalities have a strong vocation for volunteering, especially in Lombardy and Piedmont.

With regard to the T representing Technology, those employed in high-tech sectors are mainly represented in Friuli Venezia Giulia, Lombardy and Veneto, less in Liguria. Among the newly considered determinants, cultural amenities are mainly present in the peri-urban areas of Emilia-Romagna and Liguria, less in the peri-urban areas of Trentino - South Tyrol. The differences lie in the expenditure values, as the peri-urban municipalities in Friuli Venezia Giulia and Trentino- South Tyrol peri-urban municipalities spend more on average than in other regions. This is probably since these two regions have a special legislative and financial autonomy, which the other regions do not have.

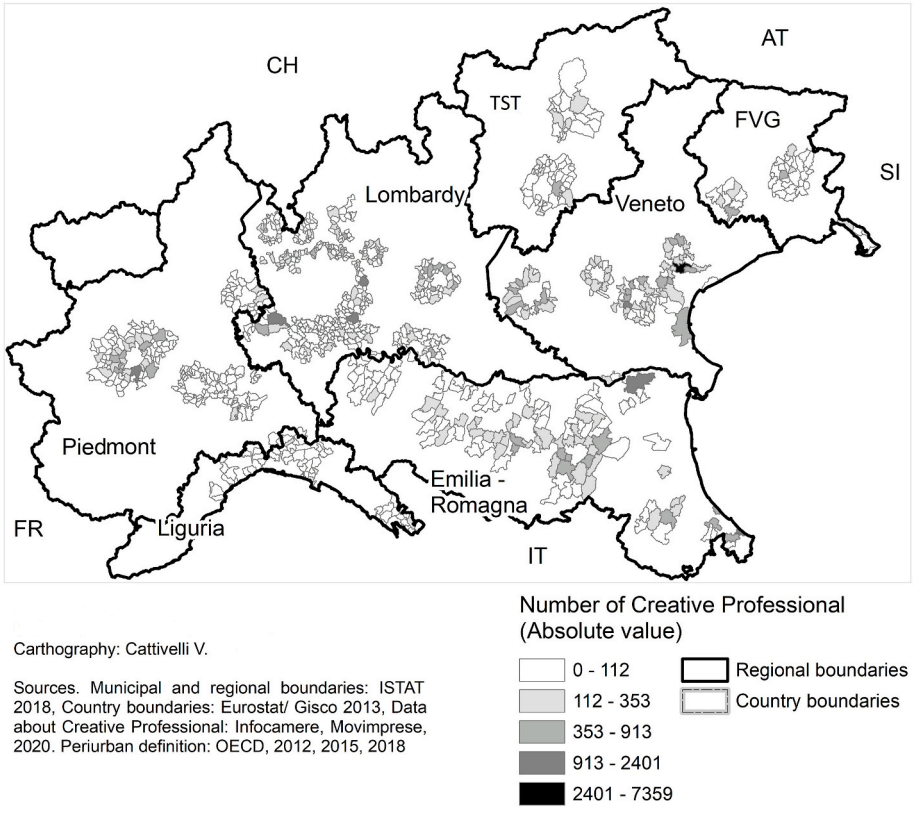

Fig. 4. The professional creatives in urban and peri-urban municipalities.

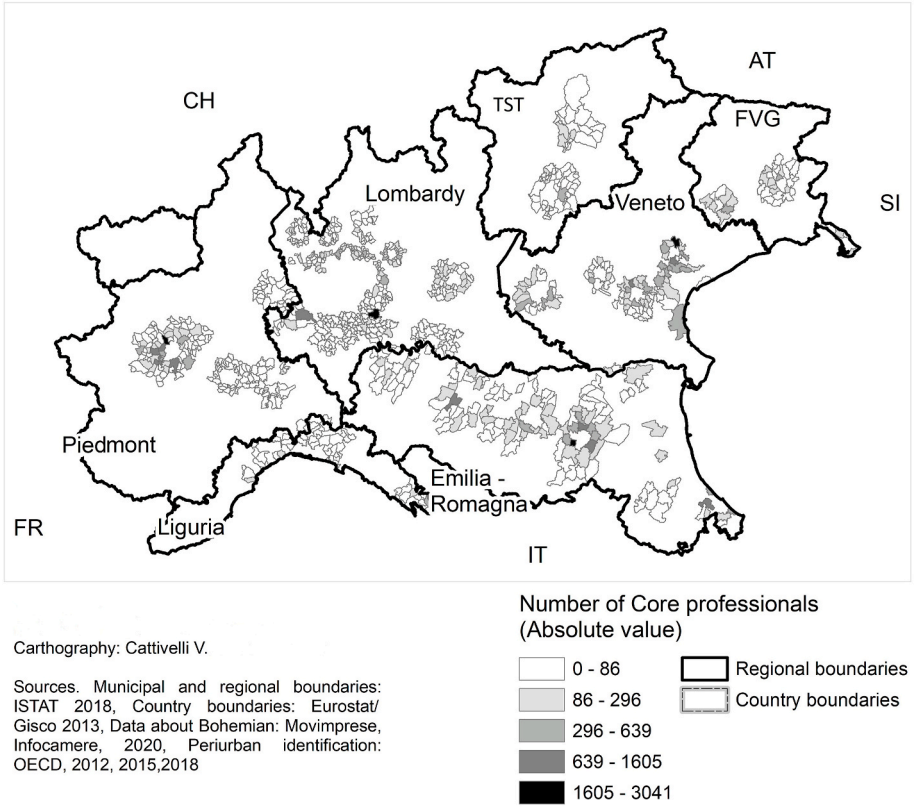

Fig. 5. The creative core individuals in urban and peri-urban municipalities.

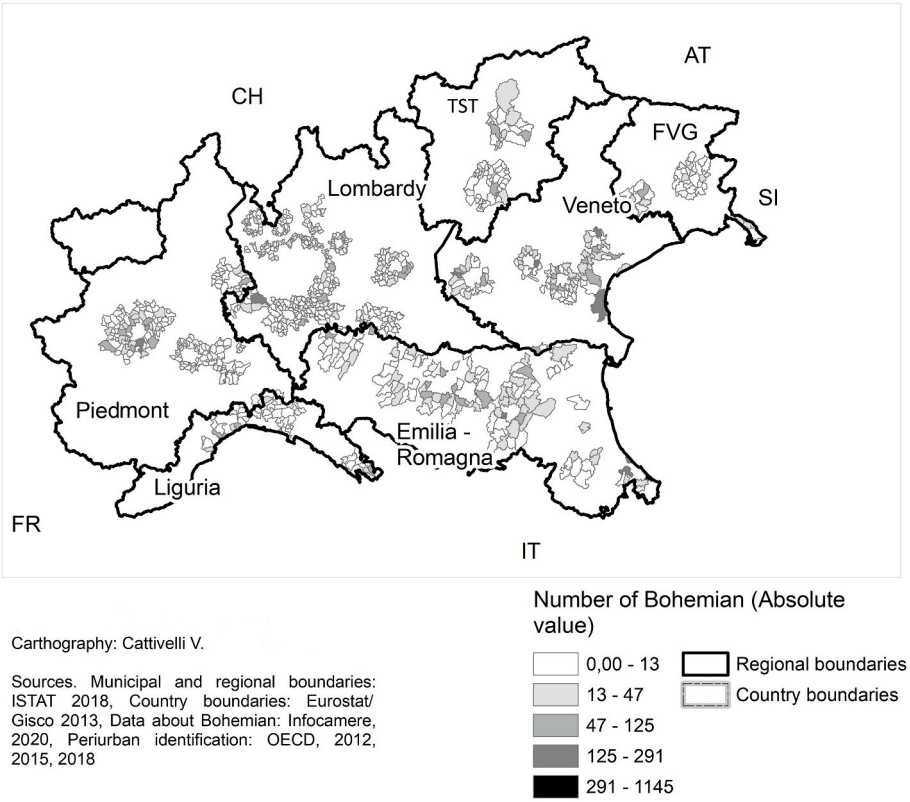

Fig. 6. The bohemians in urban and peri-urban municipalities.

Concerning attractiveness measures, data reveal that municipal productive systems include many non-creative firms in all regions, with more emphasises in Emilia-Romagna and Friuli Venezia Giulia. They also demonstrate that creative firms, professional and creative core firms are the most dispersed, especially in those municipalities with higher numbers of professional and creative core individuals. Bohemian firms are less widespread, except in Emilia-Romagna and Veneto. Regarding urban climate measures, data on population density demonstrate that values for peri-urban areas are similar in all regions considered. However, Lombardy and Trentino - South Tyrol are the two exceptions, showing the highest and lowest values, respectively. Finally, the distance values demonstrate that all peri-urban municipalities are connected to the nearby urban centres in less than 30 min.

The different dimensions that exist between these localisation determinants are outlined by a PCA. This analysis also makes it possible to reduce the number of predictors. On the one hand, it is carried out taking into account all localisation variables and, on the other hand, without the CIVILUNION. In the first round of PCA, CIVILUNION enters the first dimension, but we decided not to include this factor in the second round of PCA, as we wanted to test it separately in the regression models and point out its relevance, which is assumed to be controversial by Baez et al. (2014) and Vossen et al. (2019). We started by including all localisation factors as described above, except for PROFCREA, CORECREA, BOHECREA and TOTCREA, as they are the dependent variables.

We chose the criteria of cumulative percentage of 75% variance as a threshold for factors selection. Consequently, we identify 4 factors explaining 75.71% of variance. The first dimension (SOCIO-ECONOMIC CONTEXT) explains 48.76% of total variance and includes: NOPROFITIST, NOPROFITVOL, VOLUNTCREA, TOTALEXPE, TOTCREAFIRM, NFIRM. The next 3 dimensions include: NET_MIGRATION, HIGHTECH_EMP, POPDEN (dim 2, 9.88%), DISTANCE (dim 3, 8.77%), FORFIRM (dim 4, 8.30%).

4.3. The regression models result

We ran multiple regression models to test the effects of localisation factors on the presence of each category of creatives (Bohemians, Professionals, Core) and on the universe of creatives.

The dependent variables are TOTCREA, BOHECREA, PROFCREA and CORECREA respectively. In addition to the models for TOTCREA, we built separate models for three categories of creatives, as different explanations may be relevant for each type. We ran the regression models for the whole area of Northern Italy and separately for the regions considered.

The first predictor we tested was the dimension SOCIO-ECONOMIC CONTEXT dimension resulting from the PCA. It represents the role of the social and economic environment in attracting creatives. In particular, it takes into account the contribution of volunteering sector, public spending and thus the services provisions and their relevance in the quality of life, the job opportunities represented by the number of firms, creative and non-creative. The first PCA dimension is the only one we included in the regression models. The other variables are treated as separate predictors to thoroughly investigate their effect on the presence of the creative class.

The next predictors were CIVILUNION and FORFIRM to test the influence of tolerance, NET _MGRATION as a general indicator of the attractiveness of a municipality and HIGHTECH_EMP, which measures the importance of technology as the creative class localisation determinant.

The next group of predictors included POPDEN and DISTANCE, which measured how the accessibility of the urban climate influences the attractiveness of the peri-urban areas. Finally, the last predictor is CULTAMEN as a representation of municipal cultural heritage resources.

In the models with dependent variables such as PROFCREA and CORECREA, we included BOHECREA as a predictor to verify its influence in attracting the other two categories of creatives, following the thesis of Boschma and Fritsch (2009).

Table 3
Localisation determinants. Descriptive statistics.

	Mean	Standard deviation	Median	Minimum	Maximum
FORFIRM	0.67	3.18	0.07	0.00	45.50
Emilia-Romagna	0.76	2.49	0.08	0.00	22.58
Friuli-Venezia Giulia	0.21	0.60	0.02	0.00	3.00
Liguria	1.27	5.95	0.02	0.00	45.50
Lombardy	0.74	3.23	0.08	0.00	41.00
Piedmont	0.45	2.16	0.06	0.00	27.09
Trentino-South Tyrol	0.81	4.93	0.06	0.00	17.00
Veneto	0.32	1.23	0.04	0.00	9.83
CIVILUNION	**0.82**	**1.68**	**0.00**	**0.00**	**20.00**
Emilia-Romagna	1.39	1.97	1.00	0.00	13.00
Friuli-Venezia Giulia	0.90	2.50	0.00	0.00	15.00
Liguria	0.60	1.28	0.00	0.00	7.00
Lombardy	0.57	1.24	0.00	0.00	9.00
Piedmont	0.70	1.98	0.00	0.00	20.00
Trentino-South Tyrol	0.42	0.88	0.00	0.00	4.00
Veneto	1.72	1.87	1.50	0.00	10.00
NOPROFITIST	**34.66**	**40.20**	**22.00**	**0.00**	**485.00**
Emilia-Romagna	49.41	33.72	42.00	10.00	215.00
Friuli-Venezia Giulia	49.82	27.13	47.00	8.00	106.00
Liguria	26.81	28.81	17.00	0.00	192.00
Lombardy	25.08	36.86	16.00	0.00	485.00
Piedmont	26.31	42.41	10.00	0.00	300.00
Trentino-South Tyrol	36.17	35.52	24.00	2.00	190.00
Veneto	68.61	46.61	61.00	2.00	262.00
NOPROFITVOL	**513.5**	**580.24**	**333.00**	**0.00**	**5595.00**
Emilia-Romagna	732.23	487.84	632.00	144.00	3415.00
Friuli-Venezia Giulia	776.64	445.17	685.00	72.00	1830.00
Liguria	413.45	418.48	299.00	0.00	2173.00
Lombardy	373.27	524.38	232.00	0.00	5595.00
Piedmont	375.31	593.96	174.00	0.00	3481.00
Trentino-South Tyrol	680.20	678.31	495.00	19.00	3320.00
Veneto	905.93	650.77	752.00	62.00	3471.00
VOLUNTCREA	**5.04**	**6.63**	**3.00**	**0.00**	**68.00**
Emilia-Romagna	6.59	5.91	5.00	0.00	35.00
Friuli-Venezia Giulia	9.67	5.94	9.00	1.00	24.00
Liguria	4.07	5.44	3.00	0.00	33.00
Lombardy	3.28	5.81	2.00	0.00	68.00
Piedmont	4.09	6.61	2.00	0.00	36.00
Trentino-South Tyrol	6.86	7.32	5.00	0.00	41.00
Veneto	9.46	7.77	8.00	0.00	45.00
HIGHTECH_EMP	**2.49**	**4.13**	**1.33**	**0.00**	**40.94**
Emilia-Romagna	2.59	3.51	1.46	0.00	17.32
Friuli-Venezia Giulia	3.12	4.68	2.20	0.00	26.81
Liguria	1.34	2.22	0.63	0.00	11.96
Lombardy	2.78	4.51	1.48	0.00	40.94
Piedmont	2.42	4.98	0.84	0.00	39.24
Trentino-South Tyrol	1.21	1.33	0.77	0.00	7.04
Veneto	2.79	3.13	2.09	0.00	25.44
CULTAMEN	**16.41**	**30.03**	**7.00**	**0.00**	**452.00**
Emilia-Romagna	38.02	43.71	30.00	0.00	452.00
Friuli-Venezia Giulia	14.41	15.06	11.00	0.00	77.00
Liguria	33.70	28.59	29.00	2.00	158.00
Lombardy	6.96	13.48	4.00	0.00	165.00
Piedmont	8.22	14.06	4.00	0.00	118.00
Trentino-South Tyrol	4.83	6.02	3.00	0.00	28.00
Veneto	36.38	54.15	21.00	1.00	409.00
TOTALEXPE	**4,025,174.00**	**5386989.81**	**2,254,428.00**	**58,061.20**	**43,627,631.00**
Emilia-Romagna	6,036,416.13	5,168,266.57	5,170,197.36	956,656.69	39,167,663.57
Friuli-Venezia Giulia	9,812,372.73	6,986,778.57	8,893,890.14	1,313,310.59	31,449,391.42
Liguria	2,971,059.77	3,123,201.02	1,908,584.43	58,061.20	16,552,882.45
Lombardy	2,472,589.97	3,160,133.51	1,714,606.82	179,478.15	34,900,119.29
Piedmont	3,197,508.74	6,169,883.58	1,013,122.45	104,190.60	35,281,133.21
Trentino-South Tyrol	6,348,058.02	9,158,874.37	2,696,213.89	2,696,214.00	43,627,630.61
Veneto	5,860,029.95	4,808,075.18	4,569,984.38	448,569.80	34,693,532.78
NFIRM	**411.38**	**469.87**	**253.00**	**6.00**	**4315.00**
Emilia-Romagna	828.06	613.15	704.50	137.00	3104.00
Friuli-Venezia Giulia	414.69	232.90	389.00	83.00	1015.00
Liguria	255.76	290.22	169.00	6.00	1935.00
Lombardy	282.74	352.51	187.00	13.00	4315.00
Piedmont	330.29	541.20	128.00	10.00	3554.00
Trentino-South Tyrol	303.83	330.65	210.00	13.00	1693.00
Veneto	856.21	522.23	744.00	40.00	3.412,00
NET_MIGRATION	**26.92**	**12.84**	**25.43**	**0.82**	**94.12**
Emilia-Romagna	28.57	10.39	26.83	11.99	60.32

(*continued on next page*)

Table 3 (*continued*)

	Mean	Standard deviation	Median	Minimum	Maximum
Friuli-Venezia Giulia	32.95	11.79	30.51	11.16	61.26
Liguria	22.01	10.14	20.38	4.76	54.26
Lombardy	27.12	12.82	25.38	0.82	81.01
Piedmont	25.18	12.66	23.35	3.40	75.40
Trentino-South Tyrol	25.23	21.11	20.02	6.42	94.12
Veneto	29.48	9.28	28.41	9.19	57.40
PROFFIRM	**41.08**	**63.14**	**20.00**	**0.00**	**615.00**
Emilia-Romagna	65.87	76.28	41.00	4.00	591.00
Friuli-Venezia Giulia	31.41	27.49	24.00	4.00	127.00
Liguria	20.06	37.14	9.00	0.00	273.00
Lombardy	32.21	54.65	18.00	0.00	615.00
Piedmont	34.12	70.63	9.00	0.00	574.00
Trentino-South Tyrol	14.73	22.35	6.00	0.00	111.00
Veneto	94.33	66.08	79.00	3.00	275.00
COREFIRM	**28.08**	**42.58**	**13.00**	**0.00**	**370.00**
Emilia-Romagna	41.64	43.85	27.00	1.00	249.00
Friuli-Venezia Giulia	28.54	26.36	23.00	1.00	140.00
Liguria	11.12	21.03	5.00	0.00	159.00
Lombardy	20.93	36.08	10.00	0.00	370.00
Piedmont	24.10	50.04	5.00	0.00	336.00
Trentino-South Tyrol	14.31	20.94	7.00	0.00	105.00
Veneto	68.32	49.18	54.00	4.00	194.00
BOHEFIRM	**5.36**	**10.47**	**3.00**	**0.00**	**208.00**
Emilia-Romagna	10.15	20.84	6.00	0.00	208.00
Friuli-Venezia Giulia	5.08	3.67	4.00	0.00	19.00
Liguria	4.36	8.07	1.00	0.00	46.00
Lombardy	3.95	6.02	2.00	0.00	58.00
Piedmont	3.87	7.82	1.00	0.00	49.00
Trentino-South Tyrol	2.03	3.04	1.00	0.00	16.00
Veneto	10.47	10.61	8.00	0.00	78.00
TOTCREAFIRM	**74.52**	**112.79**	**36.00**	**0.00**	**1032.00**
Emilia-Romagna	117.65	134.00	73.00	150.00	4202.00
Friuli-Venezia Giulia	65.03	55.11	59.00	7.00	286.00
Liguria	35.54	65.12	15.00	0.00	478.00
Lombardy	57.09	95.39	31.00	0.00	1032.00
Piedmont	62.09	127.36	14.00	0.00	950.00
Trentino-South Tyrol	31.07	45.22	17.00	0.00	220.00
Veneto	173.13	122.39	142.00	0.00	3900.00
POPDEN	**445.11**	**492.05**	**251.72**	**4.68**	**2870.78**
Emilia-Romagna	257.45	289.01	183.45	15.25	2103.20
Friuli-Venezia Giulia	259.54	206.18	201.54	52.47	974.95
Liguria	252.35	296.48	144.95	4.68	1659.68
Lombardy	641.91	577.27	442.91	8.78	2801.58
Piedmont	314.24	483.22	122.47	33.81	2870.78
Trentino-South Tyrol	174.35	168.81	111.37	9.91	744.71
Veneto	594.49	336.93	573.67	82.48	1865.69
DISTANCE	**206.3**	**25.54**	**73.00**	**0.00**	**7828.00**
Emilia-Romagna	20.93	11.29	17.70	5.53	88.71
Friuli-Venezia Giulia	21.05	23.61	13.14	6.84	101.70
Liguria	23.21	11.18	21.75	6.23	53.18
Lombardy	26.38	33.10	22.43	3.50	577.82
Piedmont	36.83	24.22	26.00	8.63	85.21
Trentino-South Tyrol	20.53	10.01	18.85	8.82	50.15
Veneto	15.62	7.10	14.22	6.56	41.84

Source: own elaboration based on several data, 2020.

For the whole dataset and each region separately, we performed a regression analysis. In our study, the municipalities are dependent on one another when we considered a peri-urban area in a region, but otherwise they can be considered independent. We accounted for this spatial autocorrelation by using the Durbin spatial models. After evaluating the goodness of the model, the results of the best solution are presented in the tables. Table 4 shows the results of the regression analysis for both total creative individuals and three creative categories for the entire Northern Italy.

A key finding, and one that we expected is that there is a strong positive statistical correlation between the share of total creatives and the socio-economic context in the whole data set. Detailing this dimension reveals that creatives are attracted to peri-urban areas, which are characterised by a strong propensity for volunteering and a high level of quality of life. Furthermore, creatives tend to settle in peri-urban areas that have a favourable entrepreneurial context, with a high presence of creative and not creative firms.

This confirms the preference of the creative class for places where clusters of creative firms are already present (as described by Boix et al., 2014), but at the same time it also reveals a desire for places where predominantly non-creative firms are located. This means that they are looking for employment opportunities also in non-creative sectors. The socio-economic context is also important for each of the creative categories considered.

Civil unions have a strong positive effect on the presence of individual creatives. In other words, the creative class is attracted to tolerant peri-urban places. This is true for all creatives and for each creative's category. The number of firms run by foreigners is positive for Bohemians. This result confirms that Bohemians are attracted to tolerant places. The results of the attractiveness index are positive only in the

Table 4
Regressions Explaining the Creative Class for all considered peri-urban areas.

	TOTAL							
	TOTCREA		BOHECREA		PROFCREA		CORECREA	
	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)
Constant	118.150***	17.823	12.369***	1.637	70.413***	14.222	48.996***	3.995
SOCIO-ECONOMIC CONTEXT	119.290***	3.012	6.632***	0.327	54.638***	2.347	43.779***	1.962
CIVILUNION	18.823***	3.421	1.282***	0.364	8.953***	2.145	6.228***	1.751
DISTANCE	0.336	0.567	−0.025	0.028	0.473	0.327	0.154	0.161
HIGHTECH_EMP	−2.035.	1.172	−0.157	0.124	−1.621*	0.732	0.100	0.598
NET_MIGRATION	0.454	0.484	−0.098*	0.042	0.316	0.267	0.677**	0.209
CULTAMEN	−0.662**	0.196	0.003	0.020	−0.500***	0.121	−0.605***	0.116
FORFIRM	0.136	0.934	0.343*	0.158	−0.563	0.891	0.259	0.747
POPDEN	0.006	0.013	0.0004	0.001	−0.002	0.006	0.007	0.006
BOHECREA					0.491**	0.155	0.382**	0.134
	Value	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**
SEM Lambda λ							0.213***	−29.936
SDM Rho ρ	0.194***	24.441			0.151***	15.485		
N	910		914		914		907	
DF	11		10		12		12	
LogLikelihood	−5792.812		−3775.72		−5394.239		−5169.793	
AIC	11624		7571.4		10830		10364	

Statistically significant levels: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'.

case of core creative people and slightly negative for Bohemians. It is not significant for the other categories. The determinant high-tech employees is negative and significant only for the professional creatives, while it is insignificant for the other categories. This suggests that the role of technology in attracting creatives in peri-urban areas is more controversial than assumed in Florida. The determinants of distance and population density have no effect. This means that the accessibility of the close urban centre is not considered a relevant determinant of attraction.

The positive effect of bohemians in explaining professional and core creatives confirms that creatives go to places where other creatives are already present. Unexpectedly, the results regarding the effect of the determinant cultural institutions are negative for all creatives, professional and core creatives. This means that for these types of creatives, cultural heritage resources have a negative impact on their choice of location. This is contrary to Grodach and Loukaitou-Sideris (2007).

Subsequently, Table 5 and Table 6 represent the evaluation for the same creative categories, but for the regions of Lombardy and Emilia-Romagna. We decided to focus on these two regions and examine the corresponding data directly in the text, as Lombardy is the most creative region in Italy and Emilia-Romagna has the highest scores overall for the tolerance/integration indicators in the peri-urban areas.

Specifically, in Lombardy, the socio-economic context has a strong positive effect in explaining both the totality of creatives and the three types of creatives. The civil union presents a small negative effect on bohemians and, in contrast, a positive effect on core creatives. When explaining the professional creatives, there is no effect. This means that the core creatives here are more likely to be attracted to tolerant peri-urban areas.

The presence of foreign-led active firms does not affect the presence of creatives, except in the case of bohemians. Employment in the high-tech sector across the employment sector has a negative impact on the total number of creatives and creatives, suggesting that technology is not a positive factor in location choice. Population density has a small negative impact on the total number of creatives, professional and core creatives. This implies that access to the urban climate is not considered a relevant factor for localisation. Surprisingly, cultural amenities have a negative effect in explaining total creatives, professionals and core creatives. This is probably related to the low concentration of cultural amenities in some Lombardy peri-urban municipalities. Finally,

Table 5
Regressions explaining the creative class in Lombardy.

	LOMBARDY							
	TOTCREA		BOHECREA		PROFCREA		CORECREA	
	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)
Constant	268.773***	20.539	10.756***	1.912	189.793***	13.671	80.411***	9.679
SOCIO-ECONOMIC CONTEXT	141.534***	5.684	6.003***	0.523	85.423***	3.987	48.705***	2.846
CIVILUNION	3.878	4.483	−0.872*	0.400	0.969	2.854	7.166***	2.046
DISTANCE	0.159	0.312	0.052.	0.029	−0.185	0.202	0.145	0.146
HIGHTECH_EMP	−2.166*	1.067	−0.106	0.098	−1.777*	0.690	−0.490	0.487
NET_MIGRATION	0.084	0.049	0.009	0.037	−0.565*	0.262	0.239	0.188
CULTAMEN	−3.029***	0.084	−0.007	0.071	−0.860.	0.498	−1.149**	0.381
FORFIRM	2.180	1.469	0.081	0.135	1.271	0.946	1.012	0.666
POPDEN	−0.048***	0.011	−0.002	0.001	−0.052***	0.007	−0.001*	0.005
BOHECREA					−0.182	0.250	−0.121	0.176
	Value	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**
SEM Lambda λ								
N	355		351		354		353	
DF	10		10		11		11	
LogLikelihood	−2091.504		−1231.12		−1929.662		−1799.772	
AIC	4203		2482.2		3881.3		3621.5	
Adj. R^2	0.796		0.664		0.825		0.719	

Statistically significant levels: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'.

Table 6
Regressions explaining the creative class in Emilia-Romagna.

	EMILIA ROMAGNA							
	TOTCREA		BOHECREA		PROFCREA		CORECREA	
	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)
Constant	96.210	66.489	29.666**	9.468	−3.227	40.632	68.659.	36.580
SOCIO-ECONOMIC CONTEXT	112.50***	14.260	11.557***	1.918	38.706***	9.123	46.301***	8.517
CIVILUNION	26.352**	8.071	−0.317	1.102	15.892**	4.868	7.047	4.721
DISTANCE	−0.914	1.273	−0.159	0.177	−0.497	0.749	−0.241	0.692
HIGHTECH_EMP	−1.284	4.063	0.080	0.522	1.083	2.329	−3.646	2.258
NET_MIGRATION	1.030	1.416	−0.8743***	0.193	1.449.	0.866	0.685	0.834
CULTAMEN	−1.730*	0.765	−0.307**	0.108	−0.469	0.465	−0.544	0.420
FORFIRM	3.545	9.322	0.742	1.158	1.359	5.341	−0.881	5.006
POPDEN	0.377***	0.018	0.065**	0.015	0.200**	0.071	0.033	0.070
BOHECREA					−0.201	0.374	0.646.	0.333
	Value	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**
SEM Lambda λ	0.267**	6.994	0.463***	30.745	0.394***	18.593		
N	122		123		121		122	
DF	11		11		12		11	
LogLikelihood	−776.837		−541.921		−706.307		−700.435	
AIC	1575.7		1105.8		1436.6		1422.9	
Adj. R^2							0.658	

Statistically significant levels: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'.

bohemians are not statistically significant for professional and core creatives. In other words, the high presence of bohemians is not a localising factor in the choice of core and professional creatives. In Emilia-Romagna, the socio-economic context has a strong positive effect on explaining all types of creatives. Civil unions indicate a significant positive result only for the totality of creatives, confirming the tolerant vocation of this region. Instead, net migration as a representation of Attractiveness/Attraction index is negatively significant for bohemians and positive for professional creatives. In contrast to Lombardy, the results for population density are positive, especially when explaining total creatives and bohemians. This suggests that creative people in Emilia-Romagna tend to move to towards peri-urban municipalities closer to the urban areas. Cultural amenities here also have a negative impact on the total of creatives and bohemians. The results show that Bohemians have a positive effect on professional creatives, while this effect is not significant for core creatives. This means that the professional creatives are attracted to the bohemian-oriented peri-urban areas.

As in the other regions, the socio-economic context is the most important determinant in modelling the presence of the creative class, and always with positive effects. The strength of the other determinants depends on the socio-economic and spatial characteristics of each region (Tables 7–11).

5. Discussion

Our study illustrates strong empirical evidence that the creative class is present and unevenly distributed across peri-urban areas in Northern Italian regions.

This class is concentrated above all in the largest peri-urban municipalities and in those closest to urban centres. Compared to the relative urban centre, in Emilia-Romagna, Friuli Venezia Giulia, Trentino – South Tyrol and Veneto, they are located more in the peri-urban areas than in the relative urban centres of reference; contrarily, the proportion is inverted in the remaining regions. The numerical analysis of each category within it demonstrates a clear prevalence of professional creatives over other types, followed by the creative core. As far as

Table 7
Regressions explaining the creative class in Friuli Venezia Giulia.

	Friuli Venezia Giulia							
	TOTCREA		BOHECREA		PROFCREA		CORECREA	
	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)
Constant	40.351	54.158	−5.265	3.010	−23.218	49.928	−26.849	45.507
SOCIO-ECONOMIC CONTEXT	59.866	10.899	0.682	0.681	11.406*	4.812	17.612.	8.832
CIVILUNION	12.121	11.613	0.177	0.993	−1.858	4.891	−3.472	11.445
DISTANCE	0.149	1.998	0.021	0.040	−0.399	0.353	0.674	1.489
HIGHTECH_EMP	4.661	4.197	0.780**	0.277	3.332	2.252	−0.794	4.204
NET_MIGRATION	1.585	0.959	0.137*	0.053	0.628*	0.300	1.634*	0.697
CULTAMEN	−0.897	1.765	0.096	0.073	1.096.	0.601	1.149	1.115
FORFIRM	−33.570	178.268	1.791	2.112	44.111**	13.687	−105.535	131.562
POPDEN	0.016	0.128	0.019*	0.008	0.183**	0.056	0.095	0.108
BOHECREA					−2.089*	1.200	−0.776	1.871
	Value	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**
SEM Lambda λ	0.459**	7.86	−0.819***	11.426				
SDM Rho ρ					−0.497*	4.859		
N	32		33		30		31	
DF	11		11		12		11	
LogLikelihood	−177.253		−94.029		−125.119		−155.325	
AIC	376.51		210.06		292.24		332.65	
Adj. R^2							0.417	

Statistically significant levels: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'.

Table 8
Regressions explaining the creative class in Liguria.

	LIGURIA							
	TOTCREA		BOHECREA		PROFCREA		CORECREA	
	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)
Constant	138.202***	26.877	−12.431	9.217	36.11*2	14.234	18.678.	10.689
SOCIO-ECONOMIC CONTEXT	82.214***	7.442	6.009***	1.275	27.472***	5.013	12.293**	3.574
CIVILUNION	−9.400.	4.970	−2.284**	0.760	4.964*	2.376	−2.946	1.961
DISTANCE	0.841	0.535	0.356**	0.135	0.566*	0.238	0.204	0.197
HIGHTECH_EMP	−0.617	2.198	−0.558.	0.293	−3.275**	1.060	−0.376	0.832
NET_MIGRATION	0.915.	0.537	−0.005	0.075	0.379	0.247	0.124	0.212
CULTAMEN	−0.897**	0.272	−0.015.	0.041	−0.231.	0.128	−0.155	0.102
FORFIRM	−2.518	1.991	−0.550.	0.299	−1.686.	0.896	−0.253	0.741
POPDEN	−0.087***	0.023	0.024***	0.004	0.002	0.015	0.011	0.012
BOHECREA					−0.097	0.181	0.591***	0.152
	Value	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**
SEM Lambda λ								
SDM Rho ρ			−0.046	0.197				
N	63		62		62		62	
DF	10		11		11		11	
LogLikelihood	−309.372		−182.244		−254.111		−242.320	
AIC	638.74		402.49		530.22		506.64	
Adj. R^2	0.816				0.779		0.718	

Statistically significant levels: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'.

Table 9
Regressions explaining the creative class in Piedmont.

	PIEDMONT							
	TOTCREA		BOHECREA		PROFCREA		CORECREA	
	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)
Constant	134.648***	20.162	14.738***	1.541	91.275***	9.749	34.458*	15.993
SOCIO-ECONOMIC CONTEXT	72.471***	4.915	5.802***	0.418	42.317***	2.778	24.909***	4.517
CIVILUNION	6.471	4.841	0.553	0.441	−0.316	2.482	−0.904	3.471
DISTANCE	−0.006	0.271	−0.027	0.017	0.205.	0.108	−0.065	0.192
HIGHTECH_EMP	−2.191*	0.932	−0.083	0.089	−0.967*	0.471	−0.646	0.699
NET_MIGRATION	−0.146	0.385	−0.123***	0.035	−0.214	0.194	0.126	0.281
CULTAMEN	1.221*	0.533	−0.002	0.051	−0.225	0.339	0.786*	0.394
FORFIRM	−3.231	5.238	−0.252	0.512	−2.832	2.683	−0.234	3.914
POPDEN	0.068***	0.019	−0.003.	0.002	−0.034**	0.012	0.063***	0.014
BOHECREA					−0.075	0.236	1.212**	0.417
	Value	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**
SEM Lambda λ			−0.324**	9.238			0.230**	6.849
N	175		174		173		175	
DF	11		11		11		12	
LogLikelihood	−961.145		−551.427		−825.090		−908.755	
AIC	1944.3		1124.9		1672.2		1841.5	
Adj. R^2					0.853			

Statistically significant levels: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'.

their distribution is concerned, high values of the Gini indices show the willingness of the creative class to concentrate territorially, at least at the regional level. However, each creative category demonstrates different values (professionals creatives are more concentrated, but less concentrated than the core creatives, for example). This implies different spatial distribution of all creatives and requires the formulation of specific planning projects for each category, as well as the different opportunities to agglomerate and benefit from the agglomeration economies or connect each other's also geographically. Localisation determinants demonstrate different values in each peri-urban area. The data relating to tolerance confirms a focus on this group of determinants almost everywhere, except for civil unions, where there is little information about localisation and probably influences its evaluation. Employees in technology and cultural amenities are unevenly distributed in peri-urban areas and this can influence further evaluations. Regarding the urban climate measures, few differences emerge among territories, and this depends on the spatial distribution of peri-urban municipalities.

With respect to modelling aspects, the most important determinant, with a positive effect in attracting creatives, are the factors related to the socio-economic dimension. Here, creatives are attracted by municipalities with a high public expenditure for services, a high commitment in volunteering and wide employment opportunities in the creative and non-creative sectors. This is true for all types of creatives. This implies more attention towards these determinants by planners and policymakers to attract creatives in their territories, and the necessity for further research to explore in more detail the influence of other determinants in attracting these people, in line with those theorised by Van Oort et al. or Boschma & Fritsch.

As Baez et al. (2014) and Vossen et al. (2019) found, tolerance also has a controversial effect in attracting creatives in our regions. Considering all peri-urban municipalities, civil unions positively influence the existence of various creative individuals. The situation changes at the regional level. It is worth noting that the coverage of this indicator in Italy only started in 2018 and to our knowledge this is the first study to use this important data to explain the creative class. Conversely, foreign-led active firms do not influence the existence of the creative

Table 10
Regressions explaining the creative class in Trentino-South Tyrol.

	TRENTINO-SOUTH TYROL							
	TOTCREA		BOHECREA		PROFCREA		CORECREA	
	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)
Constant	14.792	19.515	9.436**	3.398	20.974	20.542	−1.402	12.060
SOCIO-ECONOMIC CONTEXT	48.434***	5.390	3.847***	0.693	33.142***	5.488	18.604***	2.823
CIVILUNION	−16.700*	7.973	4.941***	1.269	−18.503*	9.105	1.295	5.159
DISTANCE	2.231***	0.534	−0.071	0.100	1.243*	0.554	0.909**	0.327
HIGHTECH_EMP	5.279	3.828	−0.897	0.608	2.102	3.713	4.175.	2.187
NET_MIGRATION	−0.721***	0.199	−0101*	0.041	−0.416.	0.222	−0.105	0.121
CULTAMEN	−3.005.	1.622	0.581*	0.246	−3.317*	1.608	−1.863*	0.871
FORFIRM	10.731	15.545	0.842	2.577	7.283	15.057	4.055	8.876
POPDEN	0.325***	0.036	−0.013*	0.006	0.159***	0.033	0.147***	0.026
BOHECREA					−0.111	0.536	−0.099	0.310
	Value	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**
SEM Lambda λ	−0.459*	5.625	0.315*	4.785				
N	55		56		55		55	
DF	11		11		11		11	
LogLikelihood	−273.545		−175.956		−263.246		−234.279	
AIC	569.09		373.91		548.49		490.56	
Adj. R^2					0.710		0.850	

Statistically significant levels: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'.

Table 11
Regressions explaining the creative class in Veneto.

	VENETO							
	TOTCREA		BOHECREA		PROFCREA		CORECREA	
	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)	Beta	SE(Beta)
Constant	−275.287.	153.057	−7.182	9.867	−47.442	96.542	−158.052.	80.964
SOCIO-ECONOMIC CONTEXT	106.572***	18.430	5.915***	1.146	51.661***	12.146	34.590***	10.065
CIVILUNION	5.334	19.601	0.631	1.361	7.888	12.427	−12.541	10.131
DISTANCE	−0.801	4.580	−0.088	0.278	0.635	2.876	−0.304	2.413
HIGHTECH_EMP	43.532**	16.117	2.536*	1.084	15.287	10.451	12.931	8.771
NET_MIGRATION	16.264***	3.674	0.486*	0.240	4.316.	2.362	8.875***	1.971
CULTAMEN	−1.692.	0.978	−0.071	0.057	−0.396	0.618	−0.920.	0.514
FORFIRM	95.770*	40.612	8.474**	2.605	−2.362	26.296	−5.298	25.401
POPDEN	−0.018	0.101	−0.001	0.006	0.026	0.064	0.016	0.054
BOHECREA					−0.132	0.763	1.262.	0.711
	Value	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**	**Value**	**Wald test**
SEM Lambda λ			−0.545***	13.164				
N	82		81		81		81	
DF	10		11		11		11	
LogLikelihood	−565.063		−345.965		−519.811		−505.517	
AIC	1150.1		713.93		1061.6		1033.00	
Adj. R2	0.685		–		0.468		0.555	

Statistically significant levels: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'.

class anywhere.

Creatives are less attracted to cultural amenities, technology and are not influenced by the urban climate. This leads us to reflect on the role of the two Ts and the possibility of investing in infrastructural connections or other aspatial ones (such as professional networks and the internet). Lombardy and Emilia-Romagna partially confirm these findings. However, these conclusions may depend on the specificities of the individual regions considered and of northern Italy as a whole.

6. Conclusion

In this paper, we have examined the determinants and localisation of the Creative Class in peri-urban areas. After a thorough review of the literature, we have attempted to adopt and examine Florida's theory by modelling the presence of the Creative Class in northern Italy. This theory remains an important theoretical framework to explain the determinants and location of this class; however, its application to our study reveals some critical issues. Tolerance is a controversial determinant as it attracts this class only in certain cases. Talent and technology have no influence on its presence, while socio-economic factors play an important role. The adopted methodological solutions based on the economic sectors to which creatives belong are a unique way of defining the creative class in Italy. However, this might require further changes as they do not make a clear distinction with other, less creative workers who operate in the same sector.

To have a complete overview of creativity in Northern Italy, we would integrate the present study with the analysis of the contribution of creative individuals in local economic performance. Indeed, explanations for regional economic growth in peri-urban areas and its determinants are still lacking. Another possible extension of the research could be related to the distribution of creatives in other hitherto under-researched areas such as the mountains or other remote areas in Italy and other European countries.

Additionally, further research could focus on the differences between different peri-urban areas. Considering that the spatial, economic, and social characteristics of peri-urban areas vary considerably from region to region, it would be appropriate to analyse whether the presence of creatives depends on these local characteristics. One of the additional

aspects that could be investigated are the cultural differences between the creative groups considered, as well as the characteristics, location, and relationship of the creative class to some capitals (e.g., social capital, human capital).

The issue of 'tolerance' requires further consideration. Methodologically, the gay or melting pot index are not efficient representations, as they are based on too generic assumptions. In contrast, the number of civil unions, used in this study, is a better indicator as it includes same-sex couples and could be considered an acceptable representation of openness in the future. Our use of other indicators, such as those on the integration of foreigners, is a good starting point as they give an idea of the extent to which a community is open to newcomers and how they are integrated into the community.

The policy proposals that emerge from this analysis indicate the need to adopt territorially oriented policies that also take into account this type of professionals and offer the possibility of designing a peri-urban blank canvas with relevance to its design. They also encourage thinking about the relationships between urban and peri-urban areas and taking action to stimulate the further location of firms operating in the creative sectors and promote vertical and horizontal relationships, as already explained by Felton et al. (2010).

CRediT authorship contribution statement

Valentina Cattivelli: Conceptualization, Data curation, Investigation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing. **Agnieszka Elzbieta Stawinoga:** Data curation, Investigation, Methodology, Validation, Formal analysis, Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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