Composite Index to Measure Cities' Creative Performance: An Empirical Study in the Portuguese Context

Margarida Rodrigues and Mário Franco *

CEFAGE-UBI Research Center, Department of Management and Economics, University of Beira Interior, Estrada do Sineiro, 6200-209 Covilhã, Portugal; mmmrodrigues@sapo.pt

* Correspondence: mfranco@ubi.pt

Abstract: This study aims to identify the indicators/indices for measuring current cities' creative performance and the individual weight of each in that performance. To do so, a review and compilation of theoretical and empirical indices already developed was undertaken, showing culture, the creative economy, and a favourable environment as inseparable sub-dimensions of creativity. This compilation allowed the construction of a Composite Index for Creativity, using a quantitative methodology, which revealed 17 factors determining cities' creative performance, for the evaluation of performance in the Portuguese context, which allows monitoring the degree of implementation of some of the targets of the 2020 Strategy. The results illustrate that Portugal follows the European tendency of including creativity in its strategies as an economic factor determining growth. With scientific rigour and quality, the weights of each sub-dimension studied in the Composite Index were determined, this being the study's main contribution. Other implications for theory and practice and an agenda for future research are also presented.

Keywords: cities; creativity; indicators; composite index and performance

1. Introduction

Increasing interest in cities' creativity has recently been shown by the academic community and by entities responsible for economic growth policies [1–4]. This interest accompanies the transition to a new economy [5] based on creativity, which includes culture, creative, and cultural industries, the creative class, and the city environment as fundamental conditions [6]. Currently, these conditions are part of cities' urban planning and are commonly associated with urban entrepreneurship [7]. This means that the tangible and intangible flows generated by creativity [8] promote urban economic growth, cities' competitiveness, and their regeneration and vitality [9]. Furthermore, these flows attract talents and their specific interests [10], as the human capital implicit in creativity.

In this context, major dynamics are found in terms of regional and local policies to promote cities' creativity and culture with benefits for the urban economy, aiming to achieve the longed-for regeneration of urban centres. These policies should, however, include various axes, namely culture, art, industry, and urban design, in order to create a comfortable city/urban environment that stimulates creativity [11]. In turn, city leaders must explore trade-offs between the potential benefits and costs of demographic changes in recent decades, considering the interests of the different agents involved in the growth process [12].

Creativity is a driver of cities' urban growth, leading necessarily to the paradigmatic change in strategies to be implemented in them [13], as tools to face the declining or stagnant economic growth caused by concentrating on traditional economic factors and policies directly only to firms [14].

This argument corroborates Florida [15], who argues that creative human capital (the creative class) has the capacity to stimulate employment and wealth creation in cities, and that the policies implemented should be the reflection of places, i.e., the cities [14]. Ratten [16] also claims that current cities have the capacity to construct the predictors to solve their problems based on creativity, on the networks this stimulates. For this author, networks are intangible spaces of creativity, entrepreneurship, and partnerships. On the other hand, the intangibility inherent in creativity and culture is a promoter of sustainable urban development [13].

Despite the vast literature on creative cities, there is a lack of studies showing the measurement of cities' performance, more precisely in the dimension of creativity. Indeed, it is important to understand how the creative economy contributes to sustainable urban development [17]; to study the contribution of industries, by typology, to entrepreneurship in cities in the current urban context [18]; and to show the relevance of cities' contextual characteristics in the formation of creative industry networks [19]. Another gap identified concerns the need to carry out studies measuring cities' performance with a high number of variables and for large samples [20]. In addition, it is essential to recognise the importance of the sub-dimensions included in the creativity dimension, such as culture, the creative industries that promote the creative economy, and the creation of a favourable environment (e.g., urban regeneration, amenities) [21]. Recently, Rodrigues and Franco [22] postulated that sustainability in cities must be mediated by culture, a creative economy, and a favorable environment, whose connection and integration is a vector for networking and urban entrepreneurship, as intangible assets that improve sustainability in cities. So, Rodrigues and Franco [22] also suggested that it is urgent to determine the scientific considerations of the inherent dimensions of cities through one of the methods suggested by the OECD (Organisation for Economic Co-operation and Development).

To these gaps is added the importance of this study for the institutional entities of Portugal, at the national and regional level, so that the public policies adopted are monitored and also to provide corrective measures to be implemented to overcome their weaknesses.

Based on these gaps, it is argued here that creativity, as one of the dimensions of current cities, is a pertinent and topical subject for research, and so the aims of this study are to: (1) Identify the indicators/indices and sub-dimensions inherent to cities' creative performance; and (2) determine the weight of each sub-dimension in the creativity dimension. Therefore, the study's main contribution lies in the construction of a Composite Index for the creativity dimension that can be generally applied. However, a composite indicator is an aggregate of all dimensions, objectives, individual indicators, and variables used [23]. Thus, in this study, the composite index is used as an auxiliary means for calculating the weights of each dimension/sub-dimension.

This introduction is followed by the Literature Review, the Methodology, and Discussion of the Results. Finally, the study's contributions to theory and practice are presented, together with suggestions for future research, the conclusions, and limitations.

2. Literature Review

2.1. Creativity in Cities

Current cities include creativity as a key element of their growth, where all interested parties are important in generating a creative, innovative environment that will determine their future competitiveness [24]. Therefore, the solution to cities' urban problems must include the development of an attractive and vibrant city through urban creativity [25].

However, creativity is consolidated by crucial determinants/sub-dimensions, which are culture (e.g., [26–28]), the creative economy (e.g., [29–33]), and a favourable environment (e.g., [26,27,29–39]).

Culture has been associated with cities' economic growth and included in urban policies and urban dynamics (urban entrepreneurship) [13,40]. Consequently, the new urban policies of creative cities stimulate sustainable urban regeneration, innovation, and improved quality of life [41]. Moreover, a city's creative sector promotes entrepreneurship in the urban context and network formation [24].

In this connection, Schaller and Guinand [42] explained that urban entrepreneurs are catalysts of new investment and allow the recuperation of abandoned buildings through regeneration. This emphasis on culture was discussed by Hall [43], concluding that the construction of a truly creative city should incorporate culture and creativity networks.

In addition, current debate on urban regeneration [43–47] has emphasized the growing role of culture in regional/local development [48], where this has become a trademark for cities [49], which highlights the weight of negative factors associated with creative cities, such as gentrification and social exclusion [50–52] caused by the elitism of the creative class, as argued by these authors. Nevertheless, Veal [53] considered that urban governance that stimulates culture aiming to provide urban well-being promotes the minimization of negative factors, i.e., the social inequalities caused by elitism. This means that cities' attractiveness depends on a sustainable structure supported by a relevant regional/local network [21,54], by their own resources and by an understanding of cultural strategies as an urban instrument [21]. Realising the potential of own resources includes the provision of regenerated areas for cultural and creative activities [55].

Regarding the creative economy, this includes economic activities that produce creative actions and generate intangible value, i.e., creative and cultural industries **[56]**. For these authors, these industries are divided into occupations linked to heritage, the arts, the media, and functional creations, which give rise to employment and wealth [57]. Howkins [58] also argued that the creative economy reflects exploitation of the economic value of creative activities by individuals who develop their imagination, i.e., the intellectual human capital that is the condition of the creative industries. Recently, Correa-Quezada et al. [59] clarified that these industries have a significant influence on local/regional development.

Concentrating on the creative industries, whose main actors are new entrepreneurs in the area of technology, media, and entertainment [60], is fundamental for a better understanding of the spatial dimension of creative work, as the existence of effective connectivity (partnerships/networks) is relevant for creative workers [61], namely social networks and open collaboration networks, to spread knowledge [62].

Similarly, Lazzeretti [63] argued that creative industries are a force of innovation and economic development, which, through sharing, sustains cities' social development. New forms of city governance prioritize cultural and social resources to improve their competitive advantage and sustainability, based on innovation and creativity [64]. Thus, culture and creativity are the path to development, urban entrepreneurship, and are part of the political agenda of leaders [65], who aim to conjugate culture, creativity, and urbanism in their cities [66].

A favourable environment is another essential factor for creativity, where Florida [67] claims that creative people (the creative class) are attracted by a tolerant urban environment, open to new ideas and new people. For this author, cities with a high density of this class will have better economic performance, as they present relevant levels of innovation, entrepreneurship, and creative business. This means that cities should be characterised by tolerance, talent, and technology (3Ts) and by cultural diversity, for new business formation, job creation, and economic growth [8,15]. However, there must be interaction between culture and the market, economy and leisure, and culture and creativity, as a crucial factor in this class's choice of location, for them to stimulate creative and cultural industries [68–71]. This environment is achieved by strategies that aim for economic growth based on partnerships/cooperation/networks [25,72] and by policies based on the creative class [8] [15], having as pillars the capacity to attract talented individuals (the creative class), urban amenities, and the quality of life offered by cities.

With creativity being connected to a knowledge-based society, where the migratory flow of people has begun to be a problem in some cities, regional/local governments have turned to public-private partnerships (3Ps) to implement policies that improve people's satisfaction, productivity, people's active participation, the possibility of accessing a continuous educational supply, the cultural provision, and the promotion of diversity, tolerance, talent, and technology (the 3Ts of Florida), aiming to reverse the demographic decline seen in some places [73]. Therefore, creative cities seek to strengthen

competitiveness, find ways to promote the interaction between culture, urban regeneration, economic development, and social questions, besides allowing diversified lifestyles [74]. The same authors consider that the primary drivers of creativity, urban regeneration, and innovation are the active participation of citizens and the formation of public-private partnerships. These partnerships allow the formation of networks and the retention of individuals with different capacities, and so are important for the economic vitality of a creative city [75,76].

2.2. Indicators of Creative Performance

Cities' performance should be measured in economic, social, and cultural terms, and in relation to creativity, based on qualitative and/or quantitative indicators [77–82].

Cities' creative performance have been measured based on indices constructed for a specific geographical context (e.g., [68,81,83–85]). However, existing studies generally focus on cities of a significant size in various countries supported by a number of minimalist indicators, with it being essential to construct a Composite Index for Creativity that reflects the weight of culture, the creative economy, and cities' favourable environment with a larger body of indicators [20,86], reflecting improvements in urban policies [87] and city sustainability [88].

Given the massive development of indices to measure creativity and due to the complexity involved in the issue, Hartley et al. [39] identified and revised 23 indices of creativity, applied at the regional and national level in cities/countries, aiming to elaborate a mix of indicators and their proxies. However, the indices analysed by these researchers do not cover all existing indices, which reflects the underlying difficulty in joining all indicators and proxies in a single index with the required scientific robustness, as stated by the same authors.

In these circumstances, it is seen to be extremely complex to explain all indices of creativity. The Table 1 below shows the sub-dimensions, and the general and specific indicators most commonly used in the theoretical and empirical literature on this topic.

Table 1. Creativity Index.

Subdimension	General Indicator	Specific Indication	Source
Culture	Places of culture and facilities	1) Interest and brands 2) Museums 3) Cinemas 4) Concerts and shows 5) Theatres 6) Restaurants and Accommodation 7) Heritage	[26–28,30,31,37–39]
	Cultural participation and attractiveness	1) Tourist bed nights 2) Museum visitors 3) Cinema attendance 4) Satisfaction with cultural amenities	
Creative economy	Creativity and employment	1) Employment in the arts, culture and entertainment 2) Employment in media and communication 3) Employment in ICT and high technology 4) Research and Development (R&D) 5) Knowledge transfer 6) Impact of creative industries on GNP 7) Total employment in creative industries 8) Territorial analysis of creative industries	[26,28–34,37–39]
	Intellectual property and innovation	1) Applications for ICT patents 2) Innovation in creative industries 3) Application of design in the community	
Favourable environment	Human capital and education	1) Higher studies in arts and humanities 2) Higher studies in ICT 3) Creative class (talent) 4) Average university rankings	[26,28,34,35,37–39,89]
	Openness, tolerance and trust	1) Foreigners with higher studies 2) Foreign population 3) Tolerance of foreigners 4) Foreigners' integration 5) People's trust 6) General tolerance	
	Local and international connections	1) Passenger flights 2) Road access 3) Direct trains to other cities	
	Governance	1) Quality and management	

Source: Own elaboration.

Summarizing, it is urgent and pertinent to study the performance of creative cities, and so it is essential to compile these indices with economic (supply/demand), social, and cultural indicators, so that urban policies can be improved [87], to encourage cities' long-term sustainable growth [88], meaning economic growth at the micro and macro level [89], and also because more studies are important in cities with platforms/networks (micro level) that act as facilitators of growth (macro level) [90] and on partnerships between all parties involved (public, private, and citizens) [91].

3. Methodology

3.1. Sample

Portugal is divided in 7 regions—North, Centre, Metropolitan area of Lisbon, Alentejo, Algarve, Azores, and Madeira, with the coastal regions having a greater density of population. Consequently, this heterogeneous distribution of the population implies that policies associated with cities' creativity have different impacts and performances. The largest cities are Lisbon, Sintra, Vila Nova de Gaia, Porto, Cascais, Loures, Braga, Matosinhos, Amadora, Almada, Oeiras, Gondomar, Seixal, Guimarães, and Odivelas. However, in this study, the sample corresponds to the universe of all Portuguese cities and towns (N = 308). Given that in this study we chose not to present the results by city, we do not show the different values obtained in the index for them, which will be filled a posteriori by another future research.

In addition, the choice of this sample is relevant to the evolution of the Portuguese economy in relation to the objectives of the 2020 Strategy, specifically the increase in the employment rate, investment in research and development (R&D), and education.

3.2. Selection of Dimensions and Variables

To fulfil the objectives defined and based on the literature review carried out, the indicators and respective proxies were categorised, the process being guided by their clarity, simplicity, reproduction, scientific nature, salience, credibility, legitimacy, and comparability [92–94]. In addition, the construction of a composite index implies statistical proof of their relevance and significance, as well as the use of more than one indicator. This means that the indicators selected to determine the performance of cities' creative dimension provide multi-dimensional measurement of concepts that cannot be measured by a single indicator [23,95].

The final data obtained per variable reflect absolute values, but they were transformed into relative values (proxy/resident population per*1000 city inhabitants), to allow subsequent comparison between cities, irrespective of their size. This means that all variables are presented in relative values, without exception.

Table 2 shows the indicators and proxies used in this research, as well as the databases and their unit of measurement.

Table 2. Creativity index for Portuguese cities.

I) Culture						
General indicator: 1.1) Places of culture and facilities						
Specific indicator	**Variable**	**N**	**Proxies**	**Databases**	**Period of reference**	**Unit of measure**
A) Places of historical interest	LIC1	308	1) Places of historical, cultural and artistic interest, such as buildings, religious structures, monuments and statues, churches and cathedrals, bridges, towers and others	Tripadvisor [1]	2018	Number
B) Museums and similar	MA1	308	1) Art galleries: buildings			
	MA2	287	2) Art galleries: exhibitions			
	MA3	308	3) Number of museums open to the public	Pordata	2016	Number
C) Cinema	CIN1	308	1) Capacity			
	CIN2	308	2) Places			
D) Concerts and Shows	CE1	304	1) Number of cultural locations	Pordata	2015	Number
	CE2	179	2) Capacity of cultural locations			
E) Theatres	TEA1	308	1) Theatres	Meloteca.com	2018	Number
F) Restaurants and accommodation	RAL1	308	1) Number of hotel establishments	Pordata	2016	Number
	RAL2	266	2) Number of rooms in hotel establishments			
	RAL3	308	3) Restaurants	Tripadvisor	2018	Number
General indicator: 1.2) Cultural participation and attractiveness						
A) Tourist bednights	DORT1	247	1) Total bed nights in hotel establishments	Pordata	2015	Number
	DORT2	244	2) Proportion of foreign guests			%
	DORT3	268	3) Total income from hotel establishments		2016	M.€
B) Museum visitors	VISM1	264	1) Total visitors	Pordata	2016	Number
	VISM2	264	2) Total foreign visitors			
C) Cinema attendance	ATENC1	308	1) Nº of spectators	Pordata	2016	Number
	ATENC2	308	2) Ticket sales			M.€
D) concerts and shows	DCE1	147	1) Nº of spectators	Pordata	2016	Number
	DCE2	147	2) Ticket sales			M.€
E) Cultural supply	OCC1	308	1) Total cultural premises (local authority)	Annals by region—INE	2016	Number
F) Local authority/public expenditure	DM1	308	1) Expenditure on cultural activities and similar			
II) Creative Economy						
General indicator: 2.1) Creative Industries						
Specific indicator	**Variable**	**N**	**Proxies**	**Databases**	**Period of reference**	**Unit of measure**
A) Creative jobs	EC1	308	1) Jobs in creative and cultural activities	INE	2016	Number
B) Impact of creative industries on GDP	ICPIB1	308	1) Turnover of cultural and creative industries			€
	ICPIB2	308	2) % of creative industries in total economic activity			%
	ICPIB3	308	3) Expenses with staff in cultural and creative industries	INE	2016	
	ICPIB4	308	4) Production of cultural and creative industries			
	ICPIB5	308	5) Intermediate consumption of cultural and creative industries			€
	ICPIB6	308	6) Gross added value, at market prices, of cultural and creative industries			
	ICPIB7	308	7) Gross fixed capital formation of cultural and creative industries			
C) Territorial analysis of creative industries	ATIC1	308	1) Total number of cultural and creative industries	INE		Number
	ATIC2	308	2) Number of people employed in creative and cultural companies, divided by the total of people employed in all economic activities and multiplied by 100;		2016	
	ATIC3	308	3) Total number of industries by city over the total of all cities (concentration) multiplied by 100	Own calculation		%
	ATIC4	308	4) Density per capita of cultural and creative industries (Nº of industries/resident population multiplied by 100)			
	ATIC5	308	5) Weight of cultural and creative industries in the total industries in the city (relevance) multiplied by 100			

Table 2. *Cont.*

Specific indicator	Variable	N	Proxies	Databases	Period of reference	Unit of measure
General indicator: 2.2) Research & Development						
	ID1	308	1) Firms with most expenditure on R&D activities			Number
A) Firms	ID2	308	2) R&D expenditure of those firms	Dgeec.mec	2016	M.€
	ID3	308	3) Total resources allocated by firms to R&D areas			Number
	TC1	308	1) R&D units in higher education institutions	Dgeec.mec	2016	
B) Knowledge transfer	TC2	308	2) Total researchers in those units financed by FCT			Number
	TC3	308	3) Higher education establishments	Pordata	2017	
	TC4	308	4) Lecturers in higher education	Pordata	2015	Number
General indicator: 2.3) Intellectual property and innovation						
	PP1	308	1) Applications for patents and similar			
A) Patent applications	PP2	308	2) Applications for patents from higher education institutions	INPI	2017	Number
	PP3	308	3) Applications for patents from other entities			
III) Favourable Environment						
General indicator: 3.1) Human capital and education						
	CC1	308	1) Number of higher education students enrolled in arts and humanities courses			
	CC2	308	2) Higher education graduates in arts and humanities	Pordata	2016	Number
	CC3	308	3) Number of higher education students enrolled in ICT courses			
A) Creative class (talent)	CC4	308	4) Higher education graduates in ICT	Annals by region—INE	2016	Number
	CC5	308	5) Higher education graduates		2016	
	CC6	308	6) Number of students in higher education	Pordata		Number
	CC7	308	7)) Number of higher education institutions			
	CC8	308	8) Employed population with average/high qualifications (secondary, post-secondary and higher)		2013	
B) HEIs' presence in rankings	PR1	308	1) HEIs in rankings	Webometrics	2018	Number
General indicator: 3.2) Openness and diversity						
	TOL1	308	1) Legally resident foreign population: total		2016	Number
A) Tolerance, social classes and young people	TOL2	308	2) Socio-cultural heterogeneity (social classes)— employees' basic average monthly salary	Pordata	2013	
	TOL3	308	3) Young population (resident population, estimated at 31 December: 0-25 years)		2016	%
	TOL4	308	4) Marriages solemnized between nationals and foreigners		2017	Number
General indicator: 3.3) Local and international connections						
A) International connections	LI1	308	1) Airports	INE	2017	Number
	LI2	308	2) Passenger arrivals by airport			
B) Local connections	LL1	308	1) Transport and storage companies	INE	2012	Number
General indicator: 3.4) Governance						
	FE1	308	1) Concluded building redevelopment (urban regeneration)	Annals by region—INE	2016	Number
A) Endogenous factors	FE2	308	2) Licensed building redevelopment (urban regeneration)			
	FE3	308	3) Annual population variation (global attractiveness for new residents)			%

Note: [1] Used by European Union [28] (p. 110). Source: Own elaboration.

3.3. Data Analysis

Data analysis was in three main stages, with statistical treatment being carried out using IBM SPSS (version 25.0) software.

The first stage was to determine the validity of the observations (308 observations representing around five times the variables analysed: 65), considering the mean value (zero) for missing data (imputation of missing data) so as not to eliminate/lose important information. Normalization of data due to the multiple units of measurement and periods of reference [23,96–101] was also performed.

The second stage involved descriptive analysis (mean, standard deviation, variation coefficient, and minimum and maximum values), but data normalization transformed the mean in zero and the standard deviation in one, and so it is not presented, according to Marôco [97] and OECD [23], in this study.

The third stage consisted of applying exploratory factor analysis (EFA) and principal component analysis (PCA), as the method to construct the Composite Index. This multivariate statistical technique allows the grouping of data that can have a similar interpretation in the sample, as well as determination of the main components that should be retained and robust data treatment [23,96–100]. This method aims to determine the weights representing the importance of the variables measured by maximum variance [101]. It is therefore possible to "summarise a set of individual indicators while preserving the maximum possible proportion of the total variation in the original data set.", as well as "largest factor loadings are assigned to the individual indicators that have the largest variation across countries, a desirable property for cross-country comparisons, as individual indicators that are similar across countries are of little interest and cannot possibly explain differences in performance" [23] (p. 26). However, in this study, the units of analysis are cities rather than countries.

Finally, to check the acceptability of this technique, we applied the Kaiser–Meyer–Olkin (KMO) [102], sample suitability measure, and the Bartlett sphericity test. To verify the internal consistency of the (sub)dimensions used, it is usual to calculate the Cronbach alpha, but in this study, the Cronbach Coefficient Alpha was not considered because the "correlations do not necessarily represent the real influence of the individual indicators on the phenomenon expressed by the composite indicator" [23] (p. 27).

4. Results

Tables 3–5 show the results obtained in the stages described above. As observed, the KMO test [102] presents values of an average quality to apply EFA [97] in the sub-dimensions of culture and favourable environment. However, for the sub-dimension of creative economy, linear dependence was found between some of the variables studied, with a Pearson correlation coefficient of 1 [97]. Therefore, from the values obtained from analysis of the correlation between the variables of this sub-dimension, the variables, ATIC3, ATIC4, ICPIB4, ICPIB5, ICPIB6, TC2, and PP3, were withdrawn.

Table 3. Culture.

Variable	h^2	Results of Exploratory Factor Analysis							Squared Factor Loading (Scaled to Unit Sum) [1]						
		Factor							Factor						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
LIC1	0.795					0.775							0.448		
MA1	0.722						0.828							0.591	
MA2	0.587						0.747							0.481	
MA3	0.579						0.600							0.310	
CIN1	0.908			0.893							0.290				
CIN2	0.849			0.904							0.297				
CE1	0.584							0.681							0.407
CE2	0.713					0.719							0.386		
TEA1	0.402		0.593							0.104					
RAL1	0.552	0.625							0.085						
RAL2	0.945	0.970							0.205						
RAL3	0.741	0.723							0.114						
DORT1	0.913	0.943							0.194						
DORT2	0.485	0.393							0.034						
DORT3	0.920	0.950							0.197						
VISM1	0.899				0.935							0.382			
VISM 2	0.882				0.921							0.370			
ATENC 1	0.891		0.859							0.218					
ATENC2	0.885		0.873							0.225					
DCE1	0.553							0.659							0.381
DCE2	0.567		0.612							0.111					
OCC1	0.664					0.785							0.460		
DM1	0.606							0.528						0.240	
Eigenvalue		4.59	3.38	2.75	2.29	1.34	1.16	1.14							
% Explained variance		17.21	11.53	9.87	9.39	9.32	9.01	6.03							
Total explained variance		72.35							0.276 [2]	0.203	0.165	0.138	0.080	0.070	0.068

	Weights—coefficients of variables [3]						
Variable	Factor						
	1	2	3	4	5	6	7
LIC1					3.61		
MA1						4.12	
MA2						3.35	
MA3						2.16	
CIN1			4.79				
CIN2			4.91				
CE1						2.79	
CE2					3.11		
TEA1		2.11					
RAL1	2.35						
RAL2	5.65						
RAL3	3.14						
DORT1	5.34						
DORT2	0.93						
DORT3	5.42						
VISM1					5.25		
VISM 2					5.10		
ATENC 1		4.43					

Table 3. *Cont.*

Variable	h²	Results of Exploratory Factor Analysis — Factor							Squared Factor Loading (Scaled to Unit Sum) [1] — Factor						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
ATENC2			4.58												
DCE1								2.61							
DCE2			2.25												
OCC1						3.70									
DM1							1.67								
		Hotels and restaurants (22.83)	Theatres and similar (13.37)	Cinema (9.70)	Museum visitors (10.35)	Cultural supply(10.41)	Art and museums (11.31)	Cultural premises (5.39)							

[1] Example of calculation for RAL1: 0.625^2/4.59 = 0.085; [2] Example of calculation: 4.59/∑ 4.59+3.38+2.75+2.29+1.34+1.16+1.14 = 0.276; [3] Example of calculation for RAL1: (0.276*0.085) * 100 = 2.346; Source: Adapted from outputs of SPSS. Varimax rotation; N = 308; KMO = 0.711; Bartlett Sphericity Test = 2335.137; gl = 253; $p < 0.000$.

Table 4. Creative economy.

Variable	h²	Results of Exploratory Factor Analysis — Factor					Squared Factor Loading (Scaled to unit sum) — Factor					Weights—Coefficients of Variables — Factor				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
EC1	0.964		0.797					0.241					4.66			
ICPIB1	0.960		0.938					0.333					6.45			
ICPIB2	0.971				0.977					0.697					7.00	
ICPIB3	0.930		0.889					0.299					5.79			
ICPIB7	0.806		0.866					0.284					5.50			
ATIC1	0.705		0.710					0.191					3.70			
ATIC2	0.979				0.981					0.702					7.06	
ATIC5	0.956					0.958					0.987					6.73
ID1	0.639			0.791					0.297					4.59		
ID2	0.905			0.937					0.416					6.44		
ID3	0.774			0.792					0.297					4.60		
TC1	0.887	0.877					0.117					5.64				
TC3	0.615	0.721					0.079					3.81				
TC4	0.945	0.917					0.128					6.17				
PP1	0.809	0.867					0.114					5.51				
PP2	0.795	0.889					0.120					5.79				
Eigenvalue		6.59	2.64	2.11	1.37	0.93						R&D in higher education institutions (26.92)	Creative industries' contribution to GDP (26.10)	R&D in firms(15.62)	Proportion of creative industries (14.05)	Weight of creative industries (6.73)
%Explained variance		25.42	25.12	14.49	13.69	6.52										
Total explained variance		85.25					0.483	0.194	0.155	0.100	0.068					

Note: Varimax Rotation; N = 308; KMO = 0.723; Bartlett Sphericity Test: = 6244.488; gl = 120; $p < 0.000$; Source: Adapted from outputs of SPSS.

Table 5. Favourable Environment.

Variable	h²	Results of Exploratory Factor Analysis — Factor 1	2	3	4	5	Squared Factor Loading (Scaled to Unit Sum) — Factor 1	2	3	4	5	Weights—Coefficients of Variables — Factor 1	2	3	4	5
CC1	0.832	0.907					0.115					5.72				
CC2	0.821	0.901					0.113					5.65				
CC3	0.866	0.924					0.119					5.94				
CC4	0.802	0.890					0.110					5.60				
CC5	0.934	0.961					0.129					6.42				
CC6	0.947	0.967					0.130					6.50				
CC7	0.638	0.778					0.084					4.21				
CC8	0.562	0.529					0.039					1.95				
PR1	0.546	0.702					0.069					3.43				
TOL1	0.714				0.842					0.496					4.93	
TOL2	0.802		0.877					0.306					5.35			
TOL3	0.619		0.759					0.230					4.01			
TOL4	0.695				0.805					0.453					4.51	
LI1	0.560			0.690					0.222					3.31		
LI2	0.618					0.565					0.285					2.22
LL1	0.794					0.861					0.662					5.16
FE1	0.925			0.950					0.422					6.28		
FE2	0.859			0.910					0.387					5.76		
FE3	0.836		0.896					0.320					5.58			
Eigenvalue		7.18	2.51	2.14	1.43	1.12						Higher education (45.32)	Population(14.94)	Redevelopment of buildings and airports (15.35	Foreigners (9.44)	Transport (7.38)
% Explained variance		35.93	12.37	12.01	9.08	6.25										
Total explained variance	75.64						0.499	0.175	0.149	0.099	0.078					

Varimax Rotation; N = 308; KMO = 0.750; Bartlett Sphericity Test: = 6577.490; gl = 171; *p* < 0.000; Source: Adapted from outputs of SPSS.

In addition, the communalities h^2 extracted (Tables 3–5) are above the required minimum of 0.32 [103,104], where in the culture sub-dimension, these explain 16% of the variance, and 38% and 30%, respectively, of the variance in creative economy and favourable environment. The variable loadings are also always equal to or above the required minimum of 0.40 [97]. This was followed by calculation of the "weights from the matrix of factor loadings after rotation, given that the square of factor loadings represents the proportion of the total unit variance of the indicator which is explained by the factor" [23] (p. 90); [101].

Finally, we determined the weights of the sub-dimensions of culture, creative economy, and favourable environment in the Composite Index to measure cities' creative performance. More precisely, the factors' associations with the variables per sub-dimension were calculated. As observed in Tables 3–5, the weights for each variable were obtained by the product between the normalized squared loadings and the value of the variance explained for each factor.

Finally, based on the analysis presented and for greater robustness of the results. EFA was applied to the creativity dimension. as well as determining the weight of each sub-dimension analysed in that dimension. with the results appearing in Table 6.

Table 6. Exploratory factor analysis of the creativity dimension and weights.

Subdimensions	h^2	Factor—Creativity	Weights1
Culture	0.446	0.668	0.220
Creative Economy	0.772	0.878	0.380
Favourable Environment	0.810	0.900	0.399
Eigenvalue		2.03	
% Explained variance		67.59	
Total explained variance		67.59	

Varimax Rotation; N = 308; KMO = 0.607; Bartlett Sphericity Test = 299.642; gl = 3; $p < 0.000$; $h^2 > 0.67$; loadings > 0.40. Source: Adapted from outputs of SPSS. [1] Example of calculation: Culture = (0.668ˆ2/2.03) * 100 = 21.9875.

5. Discussion of the Results

According to the results obtained. Tables 3–5 show 17 crucial factors that can have an impact on the creative performance of Portuguese cities. These factors present different weights for each sub-dimension analysed per se. but the total explained variance for each of them is considerably relevant (c.f., Tables 3–5). which means that the factors obtained are explanatory and pertinent [97] in measuring creative performance. It is also noted that the communalities obtained for the variables forming the factors are high. demonstrating that the factors retained are appropriate to describe the latent correlational structure between all the variables [100].

In view of the above (see Tables 1 and 2). it is perceptible that creativity involves several axes of action. so in this discussion of results. it is postulated that "the characteristics of creativity in different areas of human endeavor can at least be articulated. For example, it can be suggested that: (1) Artistic creativity involves imagination and a capacity to generate original ideas and novel ways of interpreting the world. expressed in text. sound. and image; (2) scientific creativity involves curiosity and a willingness to experiment and make new connections in problem solving; and (3) economic creativity is a dynamic process leading towards innovation in technology. business practices. marketing. etc., and is closely linked to gaining competitive advantages in the economy" [105] (p. 42).

This. furthermore. directs this study towards the adoption of the definition of creative industries of UNCTAD [106]. that is. " . . . makes a distinction between 'upstream activities' (traditional cultural activities. such as performing arts or visual arts) and 'downstream activities' (much closer to the market. such as advertising. publishing. or media-related activities) and argues that the second group derives its commercial value from low reproduction costs and is easy transfer to other economic domains. From this perspective. cultural industries make up a subset of the creative industries."

So. the analysis of culture revealed that the variables implicit in cultural premises and facilities (provision of amenities) which stand out most are hotel capacity (RAL2) with a weight of 5.65 and

restaurant provision (RAL3) with a weight of 3.14 cinema provision is also very positive (CIN1 = 4.79) compared to theatre provision (TEA1) with a coefficient of only 2.11. since the latter is found mainly in Lisbon and Porto. In addition, the variety of premises to hold concerts and shows (CE2) presents a weight of 3.11. contrasting with reasonable public attendance (DCE1 = 2.61). Finally, cities' cultural and historical identity only shows a coefficient of 3.70. reflecting an incipient effect of local cultural policies. These results show some urban dynamics in Portuguese cities to promote existing resources to improve their creative performance. corroborating d'Ovidio and Cossu. and Oyekunle [13]. [40]. who concluded that when culture is taken to be a factor stimulating economic growth. these dynamics are generated. However, local cultural strategy should include vectors aiming for the creation of cultural spaces. such as theatres. and promote the organisation of more local shows. thereby avoiding the elitism of some cities and the consequent gentrification [53].

As for cultural participation and cities' attractiveness. hotel income stands out (DORT3 = 5.42). despite a proportion of foreign guests under 1 (DORT2). Concerning museums and similar. significant total visitor numbers are found (VISM1. MA1. MA2. and MA3). with foreign visitors representing a weight of 5.10 (VISM2). The coefficients referring to attractiveness show that conservation of local heritage and its promotion. and forming various partnerships to do so. make cities more attractive for current and potential residents and visitors. since this strategic orientation enhances the city's brand image [49].

It is also noted that Portuguese cities' cultural heritage reaches 3.70 (OCC1). despite public expenditure on culture falling far short of the desirable level (DM1 = 1.67). This lack of investment in culture highlights the need to understand networks/partnerships with other public. private. and civil institutions in large cities (e.g., Lisbon. Porto). as an instrument to enable improved performance of culture associated with creativity [21].

Summarizing. the variables implicit in this sub-dimension are divided into seven main factors/components as shown in Table 3. which corroborates the importance also attributed to them by various authors (e.g., [26,27,30,31,37–39]). These authors concluded that it is necessary to continue to recreate the crucial role played by culture in cities' attractiveness and their economy. valuing their competences and resources in this area. as well as conserving their cultural heritage. which increases effective synergies.

A city that wants to be recognised as creative should also include the creative and cultural sector—creative economy—in its economic strategies. In Portugal. creative and cultural industries have been gaining importance as contributors to micro and macro-economic growth. as argued by Tukiainen et al. [93]. These industries have tended to concentrate in the large cities. but this homogeneity of concentration has recently undergone a change stimulated by local and regional policies to encourage the growth of isolated or small towns.

Analysing the empirical evidence. there is clear relevance of the weight coefficients of the variables measuring the creative economy. Specifically, creative and cultural industries contribute to increased employment in cities by 4.66 (EC1). with the benefits for these individuals being reflected in those firms' expenditure on salaries (ICPIB3 = 5.79); presenting a turnover (ICPIB1) of 6.45 and gross capital formation of 5.50. Their weight in total economic activity (ICPIB2) is around 7 and the proportion of total employment is 7.06 (ATIC2). No less importantly. this sector presents relevance by city of 6.73. Therefore. these industries generate employment and begin to have some impact on their regions' GDP. since they reflect the exploitation of economic and intangible value by creative individuals. whose imagination takes the form of creative industries [56.58]. These industries provide cities with new jobs and greater wealth [57].

Included in these industries is R&D activity. both in firms and higher education institutions (HEI). Here. it is found that HEIs have been creating R&D units (TC1 = 5.64). although these remain in cities with HEIs (TC3 = 3.81). and so in these the weight of teaching staff is 6.17 (TC4). Another important variable in this domain is patents (PP1. PP2). where HEIs stand out with a weight of 5.79. Currently. Portuguese firms recognise the importance of R&D. and so they attribute around 6.44 to that area (ID2)

in a universe of around 100 firms (ID1 = 4.59) and allocate around 6 of human capital to this (ID3). In other words, both contribute to the spread and transfer of knowledge concerning technology and innovative ideas. with the actors being the new entrepreneurs attracted by cities' amenities [61].

Moreover. this type of creative industry forms various connections inside and outside the city. which stimulate creative individuals and facilitate the spread of knowledge [61.62]. In total. the creative economy is influenced by five factors/components. highlighting the contribution of creative industries and the area of R&D—R&D in HEIs (26.92); creative industries' contribution to GDP (26.10); R&D in firms (15.62)—where cities should use their competences and resources so that talented individuals can develop their capacities. given their important role for innovation and increased economic growth in the places they carry out their activity [28.63.64].

The third sub-dimension included in creativity is a favourable environment. A city can employ numerous tangible and intangible resources. but if it does not generate an appropriate climate for creativity. the synergies obtained will be considerably limited. Recognising the essence of this climate. Portuguese cities have introduced strategies and policies to improve the quality of life provided by openness. tolerance. capturing new talents. and valuing existing ones. by encouraging residents' participation. knowledge. and technology to increase their economic growth.

In this context. the results show five factors/components. with higher education having a total weight of 45.32. These factors allow the creation of that environment. highlighting the place of higher education with significant weight coefficients. which corroborates Lombardi et al. [31]. These authors emphasized the fundamental nature of this variable. The other factors show that the profile of residents (population. foreigners) in cities is important. as is cultural and historic buildings.

These results confirm the importance of HEIs. due to their capacity to attract talents with different training. their cultural dynamism. and innovative capacity stimulating the city's economy [28]. They also show the importance of openness and tolerance. as mentioned by Florida [8.67] Analysing these results. it was found that the weights of the number of graduates distributed over the 308 Portuguese cities and towns (CC5 = 6.42) and students attending HEIs (CC6 = 6.50) are significant. highlighting the individuals with higher education in areas considered creative (CC1/CC2 = 5.72/5.65; CC3/CC4 = 5.94/5.60). However, these results do not cover the qualified employed qualified population (CC8 = 1.95).

The spatial distribution of HEIs was also found to represent their importance for cities (CC7 = 4.21). An aspect causing these results is the openness and tolerance that should co-exist in cities (TOL2/TOL3 = 5.35/4.01), which was reflected in a positive population variation (FE3 = 5.58). As well as the significance of foreign residents (TOL1/TOL4 = 4.93/4.51). These results lead to the conclusion that cities' openness to diversify their local community stimulates the creation of an appropriate climate for creative industries (e.g., related to the amenities provided by HEIs) to be able to develop and consequently attract new residents who will stimulate the local economy [8.15]. as long as it is associated with the cultural supply as a market factor [68].

In addition, cities have been revitalized through the urban regeneration incentive (FE1/FE2 = 6.28/5.76). Although differences remain between cities regarding mobility by air (LI1/LI2 = 3.31/2.22). On the other hand, mobility on land (LL1 = 5.16) presents a high value. In other words, it is noticeable that cities have adopted policies to promote urban regeneration by locating creative industries in rehabilitated buildings. and naturally promoting urban entrepreneurship as a bonus in cities' development [44.45.47]. Mobility policies require more territorial development strategies. which could involve more strategies conceived in networks/partnerships [21.25.91]. as a way to increase the flow of people between cities and contribute to raising local economies' performance.

After this analysis of the results for cities in Portugal. the weight of each sub-dimension in a city's creative performance was shown. where culture has a weight of 0.220. creative economy 0.380. and favourable environment 0.399 (cf., Table 6). Paraphrasing Scott [5]. these weights mean we have a paradigmatic and holistic economy. which concentrates on creativity as a requirement to improve cities'

performance. besides traditional factors. as argued by Lawton et al. [6]. In this regard. the economic and political decision-makers in Portuguese cities have been implementing policies that combine culture and the creative economy based on creative and cultural industries [63] and stimulating a city environment that favours the growth of this economy. in terms of both people and firms. and in this way. combating negative aspects that have occurred in recent years [73].

Finally, the similar weights of the creative economy and the favourable environment means that creative and cultural industries' contributions to wealth and employment generation have a positive impact on the performance of Portuguese cities [15]. revealing the great importance this sector has acquired for the country's decision-makers. where cities' endogenous and exogenous resources have been used to build unique. inimitable spaces [14]. Here. networks are also beginning to play a dominant role as predictors of economic performance [16].

6. Contributions and Implications

Creativity is a complex and multi-dimensional concept. and so measuring its performance is a process that should be approached in an integrated and composite way. so that results obtained will be valid and scientifically robust. We have seen the development of a number of indicators. most of them presenting indicator weights with weak scientific robustness and applicable to large urban areas. by both public and private entities.

Concerning the global results. a Creativity Index for Portuguese cities was presented. which was seen to be apt for statistical analysis. giving it the scientific robustness this type of research demands. Besides the sub-dimensions. the variables allowed the conclusion that creative performance can be measured in economic. social. and cultural terms [77,81], specifically at a micro and not only a macro geographical level. To understand how creativity contributes to economic development [17]. A representative sample and a significant number of indicators were used [20]. Therefore. one of the main contributions of this study was the construction of a Composite Index for Creativity.

Based on the literature review carried out on the topic of research. and on the objectives proposed for this empirical study. 14 indices of creativity applied in diverse geographical contexts were compiled. allowing the identification of three sub-dimensions indissociable from creativity. these being: (1) Culture; (2) creative economy; and (3) favourable environment. Holistic grouping of the indicators and proxies. distributed over those indices. allowed their scientific measurement. leading to firm conclusions about the performance of creativity. this being another contribution of the study.

Another contribution lies in adapting these indicators to the situation of all Portuguese towns and cities. considering the availability. credibility. and comparability of the data to be used. Such a study has never been made simultaneously and inclusively for those towns and cities and with such a high number of indicators (17) and proxies (58). determining the weight coefficient for each proxy.

Yet another contribution was to give the results validity and scientific quality by using exploratory factor analysis. which allowed identification of the main indicators for each sub-dimension analysed. Therefore. the first research objective was achieved. which was to identify the most relevant sub-dimensions to measure cities' creativity.

Overall. those contributions meant the second aim could be fulfilled objectively and scientifically. as it was determined which sub-dimension had the greatest weight in creativity's performance. This represents the construction of a relevant and up-to-date Composite Index to assess and monitor that performance continuously and consistently and to reach a comparable level between cities in any geographical context.

Regarding practical implications. the results obtained show that the weights of the proxies tested on Portuguese cities vary between 0.9 and 7. expressing their positive impacts on the respective sub-dimensions. and also that Portuguese cities have the necessary competences to change their traditional view of how to improve their performance. explicitly accepting the challenge to become creative. This challenge has been expressed by these cities. by creating the essential conditions to stimulate and develop creative and cultural industries. by improving and investing in intra

and inter-collaboration networks. and encouraging closer connections between people. cultural establishments. and institutions. Furthermore. this new vision local political decision-makers have for their cities involves them being micro-platforms with creative and participative leadership. besides concentrating increasingly on investment that allows benefiting synergetically from talented. creative people. who in turn are looking for dynamic cultural spaces. revitalized through the urban regeneration associated with urban entrepreneurship.

It should be noted that the culture sub-dimension, however, presents a coefficient lower than expected. given the promotion of the understanding of this as a driver of economic growth in current creative cities. and so more local strategies are still needed. allying places' development with their current and potential cultural and human resources. recuperating and benefiting from their historical heritage stimulated by urban entrepreneurship [7,9,10,64–66].

Moreover. the results obtained provide crucial information for political decision-makers to make a solid assessment of the outputs of policies implemented in cities. Indeed. this empirical study makes a relevant contribution to city authorities and political decision-makers. by constructing and testing an instrument and tool to manage the results of their creativity strategies. and one that can be applied in any territorial context.

Concerning theory. this research advanced scientific knowledge about the complexity of the topic studied. which has been subject to great debate in the academic and political spheres. Also. in theoretical terms. it demonstrated it is possible to build a composite index whose weights are determined based on scientific methods. Testing it allows its application in any territorial and geographical context. the final result being presentation of a scientific taxonomy for creativity.

7. Limitations and Future Research Agenda

This study is not without limitations. The first concerns the subjectivity implicit in the selection of indicators and their proxies. which was imposed and limited by the availability of credible data. Therefore. the unavailability of data about the creativity dimension in Portugal gives rise to a future suggestion. This suggestion consists of proposing a challenge to make those data public and possibly reconsidering how existing data are structured. It means there are several indicators regarding the urban environment (i.e., urban facilities and environmental factors must include elements. like market prices. building age. and/or year of restructuring. presence of park and green areas in the surroundings. etc.), however, we did not include these indicators due to the unavailability of data in Portugal for all cities.

Cities and their performance are not only determined by the creativity dimension as shown in this study. which represents another limitation. It is therefore suggested that future research should investigate how governance and ICT—the intelligence dimension—can also be considered as sub-dimensions determining cities' economic growth. as well as other related ones. such as urban sustainability. Indeed. current cities should be understood holistically. and so construction of a Composite Index of Intelligence is recommended for all Portuguese towns and cities for generalized application in any geographical context.

Another limitation is the fact of the study being carried out only in Portugal. Therefore. it is also suggested this Composite Index of Creativity should be applied in other countries to enable a comparative study among countries. These future lines of research could be complemented with multiple case studies in diverse cities in Portugal and elsewhere.

Finally, we did not consider the effect that the geographical proximity between cities could have on their creative performance. since the externalities between cities is an important control variable. which is another limitation. Thus, it is suggested that in future investigations this proximity be considered and that the results obtained be compared with those presented in this study. So that implications for practice and theory can be woven from a management perspective.

8. Conclusions

In recent years, most Portuguese cities have suffered the effects of a falling population. a high rate of unemployment. And especially a lack of motivation for their reconstruction in terms of attractiveness and innovative initiatives. Therefore, official Portuguese entities. In accordance with strategic options adopted by the European Union (Strategy 2020). Have taken up the challenge to revitalize cities. This means that the emphasis and strategy includes attracting new investment and new talents. Stressing cultural identity and urban regeneration. and aiming to improve the quality of life provided irrespective of the city's geographical location—creativity. Evidently. this required cities' tangible, intangible, endogenous, and exogenous resources to be appropriately recognised and valued. As well as being assimilated as an integral part of this challenge. However, it is still necessary for Portuguese cities to become actively involved in internal and external collaboration processes (networks/partnerships).

This altered vision of current cities' role in worldwide economic development has led to the need to assess and monitor their performance through other factors besides traditional economic ones. such as GDP. employment. and others. In the academic and political domains. new factors and dimensions. such as creativity. have emerged to respond to this new innovative vision. However, the multitude of indices developed to measure creativity's effect on cities' performance do not reflect the supply and demand sides in parallel. In this line of thought. a Composite Index for Creativity was presented here. including culture. creative economy. and favourable environment as predictors of the positive performance of cities as urban platforms to raise a country's economic growth.

This index was applied to all Portuguese cities and towns. through a quantitative methodology. to determine the weight of culture. the creative economy. and a favourable environment on the Composite Index of Creativity presented. This study also revealed the need to continue to define and implement strategies that stimulate culture as an essential determinant for Portuguese cities to be increasingly creative. while the creative economy and a favourable environment reflect a change in decision-makers' visionary paradigm.

It is also argued that cities should concentrate increasingly on networks/partnerships as open collaboration processes between all the actors involved to absorb the synergies they provide to maximize their performance.

References

1. Peck, J. Struggling with the creative class. *Int. J. Urban Reg. Res.* **2005**, *29*, 740–770. [CrossRef]
2. Zimmerman, J. From brew town to cool town: Neoliberalism and the creative city development strategy in Milwaukee. *Cities* **2008**, *25*, 230–242. [CrossRef]
3. Murphy, E.; Redmond, D. The role of 'hard' and 'soft' factors for accommodating creative knowledge: Insights from Dublin's 'creative class'. *Ir. Geogr.* **2009**, *42*, 69–84. [CrossRef]
4. Ponzini, D.; Rossi, U. Becoming a creative city: The entrepreneurial mayor, network politics and the promise of an urban renaissance. *Urban Stud.* **2010**, *47*, 1037–1057. [CrossRef]
5. Scott, A.J. Creative cities: Conceptual issues and policy questions. *J. Urban Aff.* **2006**, *28*, 1–17. [CrossRef]
6. Lawton, P.; Murphy, E.; Redmond, D. Examining the role of 'creative class' ideas in urban and economic policy formation: The case of Dublin, Ireland. *Int. J. Knowl. Based Dev.* **2010**, *1*, 267–286. [CrossRef]

7. Hall, T.; Hubbard, P. The entrepreneurial city: New urban politics, new urban geographies? *Prog. Hum. Geogr.* **1996**, *20*, 153–171. [CrossRef]

8. Florida, R. *The Rise of the Creative Class (and How It's 'Transforming Work, Leisure. Community and Everyday Life)*; Brilliance Audio: New York, NY, USA, 2002.

9. Kipfer, S.; Keil, R. Toronto Inc? Planning the Competitive City in the New Toronto. *Antipode* **2002**, *34*, 227–264. [CrossRef]

10. Peck, J.; Tickell, A. *Neoliberalizing Space*; Blackwell Publishers: Oxford, UK, 2002.

11. Nohara, T.; Okamura, Y.; Kawahara, S. Research for a comprehensive and active planning method in an industrial-residential mixed area- focused on ota creative town vision in ota ward, Tokyo. *J. Malays. Inst. Plan.* **2016**, *4*, 369–382.

12. Nathan, M. After Florida: Towards an economics of diversity. *Eur. Urban Reg. Stud.* **2012**, *22*, 3–19. [CrossRef]

13. d'Ovidio, M.; Cossu, A. Culture is reclaiming the creative city: The case of Macao in Milan, Italy. *City Cult. Soc.* **2017**, *8*, 7–12. [CrossRef]

14. Audretsch, D.B. *Managing Knowledge Spillovers: The Role of Geographic Proximity*; Emerald Publishing Limited: Bingley, UK, 2003; Volume 20.

15. Florida, R. *Cities and the Creative Class*; Routledge: Abingdon, UK, 2005.

16. Ratten, V. *Entrepreneurship, Innovation and Smart Cities*; Routledge: London, UK; New York, NY, USA, 2017.

17. Cabrita, M.D.R.; Cruz-Machado, V.; Cabrita, C. Managing creative industries in the context of knowledge-based urban development. *Int. J. Knowl. Based Dev.* **2013**, *4*, 318–337. [CrossRef]

18. Audretsch, D.B.; Belitski, M.; Desai, S. Entrepreneurship and economic development in cities. *Ann. Reg. Sci.* **2015**, *55*, 33–60. [CrossRef]

19. Virta, S.; Lowe, G.F. Integrating media clusters and value networks: Insights for management theory and research from a case study of Mediapolis in Finland. *J. Manag. Organ.* **2017**, *23*, 2–21. [CrossRef]

20. Çetindamar, D.; Günsel, A. Measuring the Creativity of a City: A Proposal and an Application. *Eur. Plan. Stud.* **2012**, *20*, 1301–1318. [CrossRef]

21. Grodach, C. Urban cultural policy and creative city making. *Cities* **2017**, *68*, 82–91. [CrossRef]

22. Rodrigues, M.; Franco, M. Measuring the Performance in Creative Cities: Proposal of a Multidimensional Model. *Sustainability* **2018**, *10*, 4023. [CrossRef]

23. OECD. *Handbook on Constructing Composite Indicators: Methodology and Userguide*; OECD: Paris, France, 2008.

24. Stryjakiewicz, T.; Męczyński, M.; Stachowiak, K. Role of Creative Industries in the Post-Socialist Urban Transformation. *Quaest. Geogr.* **2014**, *33*, 19–35. [CrossRef]

25. Landry, C. *The Creative City: A Toolkit for Urban Innovators*; Earthscan: London, UK, 2000.

26. Bosch, P.; Jongeneel, S.; Rovers, V.; Neumann, H.-M.; Airaksinen, M.; Huovila, A. *CITYkeys CITYkeys List of City Indicators*; 2017.

27. Durmaz, B.; Platt, S.; Yigitcanlar, T. Creative, culture tourism and place-making: Istanbul and London film industries. *Int. J. Cult. Tour. Hosp. Res.* **2010**, *4*, 198–213. [CrossRef]

28. European Union. *The Cultural and Creative Cities Monitor*; European Union: Brussels, Belgium, 2017.

29. Joss, S.; Cowley, R.; Tomozeiu, D. Towards the 'ubiquitous eco-city': An analysis of the internationalisation of eco-city policy and practice. *Urban Res. Pract.* **2013**, *6*, 54–74. [CrossRef]

30. Kakiuchi, E. Culturally creative cities in Japan: Reality and prospects. *City Cult. Soc.* **2016**, *7*, 101–108. [CrossRef]

31. Lombardi, P.; Giordano, S.; Farouh, H.; Yousef, W. Modelling the smart city performance. *Innovation* **2012**, *25*, 137–149. [CrossRef]

32. Panal, G.; Yáñez, C. Industrias culturales en ciudades españolas, Un primer acercamiento, Cultural industries in Spanish cities. A first approach. *Rev. Estud.* **2012**, *94*, 71–103.

33. Skavronska, I. Creative industries in ukraine: Analysis and prospects of the development. *Econ. Sociol.* **2017**, *10*, 87–106. [CrossRef]

34. Caragliu, A.; del Bo, C.; Nijkamp, P. Smart cities in Europe. *J. Urban Technol.* **2011**, *18*, 65–82. [CrossRef]

35. Dhingra, M.; Chattopadhyay, S. Advancing smartness of traditional settlements-case analysis of Indian and Arab old cities. *Int. J. Sustain. Built Environ.* **2016**, *5*, 549–563. [CrossRef]

36. United States Environment Protection Agency. *Framework for Creating a Smart Growth Economic Development Strategy: A Tool for Small Cities and Towns*; United States Environment Protection Agency: Washington, DC, USA, 2016.

37. Suárez, J.A.G.; Fernández, J.I.P. Creacity, una propuesta de índice para medir la creatividad turística. Aplicación en tres destinos urbano- culturales españoles. *Rev. Estud. Reg.* **2015**, *103*, 69–108.

38. Giffinger, R.; Fertner, C.; Kramar, H.; Kalasek, R.; Pichler-Milanovic, N.; Meijers, E. *Smart Cities Ranking of European Medium-Sized Cities*; Final Report; 2007.

39. Hartley, J.; Potts, J.D.; McDonald, T.; Erkunt, C.; Kufleitner, C. CCI-CCI Creative City Index 2012. *Cult. Sci. J.* **2012**, *5*, 1–38. [CrossRef]

40. Oyekunle, O.A. The contribution of creative industries to sustainable urban development in South Africa. *Afr. J. Sci. Technol. Innov. Dev.* **2017**, *9*, 607–616. [CrossRef]

41. Martone, A.; Pennella, G.; Sepe, M. Improving quality of life through cultural regeneration and urban development: The marseille euroméditerranée renewal project. *J. Urban Regen. Renew.* **2014**, *7*, 351–362.

42. Schaller, S.; Guinand, S. Pop-up landscapes: A new trigger to push up land value? *Urban Geogr.* **2018**, *39*, 54–74. [CrossRef]

43. Hall, P. *Cities in Civilization*; Pantheon Books: New York, NY, USA, 1998; pp. 803–841.

44. Hesse, M.; Lange, B. Paradoxes of the Creative City. Contested Territories and Creative Upgrading—The Case of Berlin, Germany. *Erde* **2012**, *143*, 351–371.

45. Martí-Costa, M.; Miquel, M.P.i. The knowledge city against urban creativity? Artists' workshops and urban regeneration in Barcelona. *Eur. Urban Reg. Stud.* **2012**, *19*, 92–108. [CrossRef]

46. Krueger, R.; Buckingham, S. Towards a 'Consensual' Urban Politics? Creative Planning, Urban Sustainability and Regional Development. *Int. J. Urban Reg. Res.* **2012**, *36*, 486–503. [CrossRef]

47. Sabaté, J.; Tironi, M. Rankings. creatividad y urbanismo. *EURE* **2008**, *34*, 5–23. [CrossRef]

48. Rahbarianyazd, R.; Doratli, N. Assessing the contribution of cultural agglomeration in urban regeneration through developing cultural strategies. *Eur. Plan. Stud.* **2017**, *25*, 1714–1733. [CrossRef]

49. Okano, H.; Samson, D. Cultural urban branding and creative cities: A theoretical framework for promoting creativity in the public spaces. *Cities* **2010**, *27* (Suppl. 1), S10–S15. [CrossRef]

50. Gainza, X. Culture-led neighbourhood transformations beyond the revitalisation/gentrification dichotomy. *Urban Stud.* **2017**, *54*, 953–970. [CrossRef]

51. Catungal, J.P.; Leslie, D.; Hii, Y. Geographies of Displacement in the Creative City: The Case of Liberty Village, Toronto. *Urban Stud.* **2009**, *46*, 1095–1114. [CrossRef]

52. Barnes, K.; Waitt, G.; Gill, N.; Gibson, C. Community and Nostalgia in Urban Revitalisation: A critique of urban village and creative class strategies as remedies for social 'problems'. *Aust. Geogr.* **2006**, *37*, 335–354. [CrossRef]

53. Veal, C. Dance and wellbeing in Vancouver's 'A Healthy City for All'. *Geoforum* **2017**, *81*, 11–21. [CrossRef]

54. Liu, H.; Silva, E. Examining the dynamics of the interaction between the development of creative industries and urban spatial structure by agent-based modelling: A case study of Nanjing, China. *Urban Stud.* **2018**, *55*, 1013–1032. [CrossRef]

55. Charrieras, D.; Darchen, S.; Sigler, T. The shifting spaces of creativity in Hong Kong. *Cities* **2018**, *74*, 134–141. [CrossRef]

56. Associados, A.M. *O Setor Cultural e Criativo em Portugal*; GPEARI-Ministério da Cultura: Lisboa, Portugal, 2010.

57. Silva, F.A.; Araújo, H.E.C. *Indicador de Desenvolvimento da Economia da Cultura*; Ipea: Brasília, Brazil, 2010.

58. Howkins, J. *The Creative Economy: How People Make from Ideas*; Allen Lane: London, UK, 2001.

59. Correa-Quezada, R.; Álvarez-García, J.; De la Cruz Del Río-Rama, M.; Maldonado-Erazo, C.P. Role of Creative Industries as a Regional Growth Factor. *Sustainability* **2018**, *10*, 1649. [CrossRef]

60. Scott, A. *The Cultural Economy of Cities: Essays on the Geography of Image-Producing Industries*; Sage: New York, NY, USA, 2000.

61. Brennan-Horley, C. Multiple Work Sites and City-wide Networks: A topological approach to understanding creative work. *Aust. Geogr.* **2010**, *41*, 39–56. [CrossRef]

62. Przygodzki, Z.; Kina, E. Virtual Community for A Creative City. *Quaest. Geogr.* **2015**, *34*, 65–73. [CrossRef]

63. Lazzeretti, L. *Creative Industries and Innovation in Europe: Concepts. Measures and Comparative Case Studies*; Routledge: Abingdon, UK, 2012.

64. Lederman, J. Urban fads and consensual fictions: Creative, sustainable, and competitive city policies in buenos aires. *City Community* **2015**, *14*, 47–67. [CrossRef]

65.   Bayliss, D. The Rise of the Creative City: Culture and Creativity in Copenhagen. *Eur. Plan. Stud.* **2007**, *15*, 889–903. [CrossRef]

66.   Yde, N.C. De qué está hecha una ciudad creativa, Una propuesta para abordar la cultura, el ocio y la creatividad en la urbe contemporánea What is a Creative City made up from. An approach to culture, leisure and creativity in the contemporary city. *Athen. Digit. Rev. Pensam. Investig. Soc.* **2012**, *12*, 169–190.

67.   Florida, R. The rise of the creative class. *Wash. Mon.* **2002**, *34*, 15–25.

68.   Mommaas, H. Cultural clusters and the post-industrial city: Towards the remapping of urban cultural policy. *Urban Stud.* **2004**, *41*, 507–532. [CrossRef]

69.   He, J.; Huang, X.; Xi, G. Urban amenities for creativity: An analysis of location drivers for photography studios in Nanjing, China. *Cities* **2018**, *74*, 310–319. [CrossRef]

70.   Esmaeilpoorarabi, N.; Yigitcanlar, T.; Guaralda, M. Place quality in innovation clusters: An empirical analysis of global best practices from Singapore, Helsinki, New York, and Sydney. *Cities* **2018**, *74*, 156–168. [CrossRef]

71.   He, J.; Huang, X. Agglomeration, Differentiation and Creative Milieux: A Socioeconomic Analysis of Location Behaviour of Creative Enterprises in Shanghai. *Urban Policy Res.* **2018**, *36*, 79–96. [CrossRef]

72.   Landry, C.; Bianchini, F. The creative city. *Demos* **1995**, *12*, 7–59.

73.   Suciu, M.C.; Florea, C. An empirical study on the migration among young skilled and creative people. *Amfiteatru Econ.* **2017**, *19*, 727–741.

74.   Martone, A.; Sepe, M. Creativity, urban regeneration and sustainability: The bordeaux case study. *J. Urban Regen. Renew.* **2012**, *5*, 164–183.

75.   Friedrichs, J. Cologne—A creative city. *Eur. Plan. Stud.* **1995**, *3*, 441–463. [CrossRef]

76.   Lin, C.Y. Emerging challenges of an urban creative economy: Reflections on the governance of creative clusters in Taipei City. *Eur. Plan. Stud.* **2018**, *26*, 421–437. [CrossRef]

77.   Donegan, M.; Lowe, N. Inequality in the Creative City: Is There Still a Place for 'Old-Fashioned' Institutions? *Econ. Dev. Q.* **2008**, *22*, 46–62. [CrossRef]

78.   Lorenzen, M.; Andersen, K.V. Different creative cities: Exploring Danish data to adapt the creative class argument to small welfare economies. *Creat. Ind. J.* **2011**, *4*, 123–136. [CrossRef]

79.   Thite, M. Smart cities: Implications of urban planning for human resource development. *Hum. Resour. Dev. Int.* **2011**, *14*, 623–631. [CrossRef]

80.   Yigitcanlar, T.; Lönnqvist, A. Benchmarking knowledge-based urban development performance: Results from the international comparison of Helsinki. *Cities* **2013**, *31*, 357–369. [CrossRef]

81.   Miškovičová, A.; Vaňová, A.; Vitálišová, K.; Borseková, K. Strategies of Creative Potential Development in the Cities. In Proceedings of the 9th Annual Conference of the EuroMed-Academy-of-Business, Warsaw, Poland, 14–16 September 2016; pp. 1293–1312.

82.   Long, J. Constructing the narrative of the sustainability fix: Sustainability, social justice and representation in Austin, TX. *Urban Stud.* **2016**, *53*, 149–172. [CrossRef]

83.   Andersson, Å.E.; Andersson, D.E. Creative Cities and the New Global Hierarchy. *Appl. Spat. Anal. Policy* **2015**, *8*, 181–198. [CrossRef]

84.   Caset, F.; Derudder, B. Measurement and interpretation of 'global cultural cities' in a world of cities. *Area* **2017**, *49*, 238–248. [CrossRef]

85.   Kourtit, K.; Nijkamp, P.; Arribas, D. Smart cities in perspective—A comparative European study by means of self-organizing maps, Innovation. *Eur. J. Soc. Sci. Res.* **2012**, *25*, 229–246. [CrossRef]

86.   Flores, B.; Teixeira, C. Cidades Sustentáveis e Cidades Inteligentes: Uma Análise Dos Rankings Arcadis e European smart cities. In *2° Congresso Nacional de Inovação e Tecnologia*; São Bento do Sul: São Paulo, Brazil, 2017.

87.   Borén, T.; Young, C. Getting creative with the 'creative city'? Towards new perspectives on creativity in urban policy. *Int. J. Urban Reg. Res.* **2013**, *37*, 1799–1815. [CrossRef]

88.   Comunian, R. Rethinking the Creative City: The Role of Complexity, Networks and Interactions in the Urban Creative Economy. *Urban Stud.* **2011**, *48*, 1157–1179. [CrossRef]

89.   Suciu, C.; Suciu, N.; Schawlowski, D. Creative Entrepreneurship and Urban Vitality as Key Determinants for a Smart, Sustainable and Inclusive Development. In Proceedings of the 21st International-Business-Information-Management-Association Conference on Vision 2020: Innovation, Development Sustainability, and Economic Growth, Vienna, Austria, 27–28 June 2013; pp. 1595–1611.

90. Tukiainen, T.; Leminen, S.; Westerlund, M. Cities as Collaborative Innovation Platforms. *Technol. Innov. Manag. Rev.* **2015**, *5*, 16–23. [CrossRef]

91. Trip, J.J.; Romein, A. Creative City Policy and the Gap with Theory. *Eur. Plan. Stud.* **2014**, *22*, 2490–2509. [CrossRef]

92. Mega, V.; Pedersen, J. *Urban Sustainability Indicators*; Office for Official Publications of the European Communities: Brussels, Belgium, 1998.

93. Atabek, A.; Cosar, E.E.; Şahinöz, S. A new composite leading indicator for Turkish economic activity. *Emerg. Mark. Financ. Trade* **2005**, *41*, 45–64. [CrossRef]

94. Nardo, M.; Saisana, M.; Saltelli, A.; Tarantola, S. Tools for composite indicators building. *Analysis* **2005**, *134*, 21682.

95. Kľúčik, M.; Haluška, J. Construction of Composite Leading Indicator for the Slovak Economy. *Stiin Ńe Econ.* **2008**, *55*, 362–370.

96. Guimarães, J.A.; e Sarsfield Cabral, R.C. *Estatística*, 2nd ed.; Verlag Dashöfer: Hamburg, Germany, 2010.

97. Marôco, J. *Análise Estatística Com o SPSS Statistics*; ReportNumber, Lda: Pêro Pinheiro, Portugal, 2014.

98. Pestana, M.H.; Gageiro, J.N. *Análise de Dados Para Ciências Sociais: A Complementaridade do SPSS*; Edições Sílabo: Lisbon, Spain, 2014.

99. Hair, J.F., Jr.; Anderson, R.E.; Tatham, R.L.; William, C. *Multivariate Data Analysis with Readings*; Pearson College Div: Upper Saddle River, NJ, USA, 1995.

100. Stevens, J. Chapter 11—Exploratory and Confirmatory Factor Analysis. In *Applied Multivariate Statistics for the Social Sciences*; Associates, L.E., Ed.; Routledge: Hoboken, NJ, USA, 1986.

101. Kubrusly, L.S. Um procedimento para calcular índices a partir de uma base de dados multivariados. *Pesqui. Operacional* **2001**, *21*, 107–117. [CrossRef]

102. Kaiser, H.F. An index of factorial simplicity. *Psychometrika* **1974**, *39*, 31–36. [CrossRef]

103. Costello, A.B.; Osborne, J.W. Best Practices in Exploratory Factor Analysis: Four Recommendations for Getting the Most from Your Analysis. *Pract. Assess. Res. Educ.* **2005**, *10*, 1–9.

104. Tabachnick, B.G.; Fidell, L.S. *Sing Multivariate Statistics*; Harper Collins: Northridge, CA, USA, 1996.

105. KEA European Affairs. *The Economy of Culture in Europe, Brussels*; KEA European Affairs: Brussels, Belgium, 2006; p. 42.

106. UNCTAD. *Special Unit for South-South Cooperation—Creative Economy Report 2010, Creative Economy: A Feasible Development Option*; UNCTAD: Geneva, Switzerland, 2010; p. 7.