



Using data envelopment analysis to evaluate the efficiency of creative tourism in Portugal

Usando análise envoltória de dados para avaliar a eficiência do turismo criativo em Portugal

Mansour Ghanian

Centre of Studies in Geography and Spatial Planning – CEGOT, University of Coimbra, Portugal; mansour.ghanian@uc.pt

Paula Remoaldo

Landscape, Heritage and Territory Laboratory – Lab2PT, University of Minho, Portugal; premoaldo@geografia.uminho.pt

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Abstract

This paper presents an indicator system for evaluating Creative Tourism activities developed in four regions of Portugal through CREATOUR's pilot projects. It is a quantitative study based on primary and secondary sources. Data Envelopment Analysis (DEA) was used to evaluate the efficiency of those projects as decision-making units (DMUs). Data analysis was performed using Excel and EMS software. The results show that the overall level of tourism efficiency is relatively high, and most pilots in each region have full efficiency. However, there is still room for improvement in some of them. Based on the results of this study, Portuguese creative tourism professionals need to pay more attention to social capital and job creation as the factors that have the greatest impact on improving efficiency. This is the first study to assess the effectiveness of a pilot project in creative tourism. Therefore, the results of this study can pave the way for implementing Creative Tourism projects in other parts of the world.

Keywords: DEA, Creative Tourism, Efficiency, Tourism.

Resumo

Este artigo apresenta um sistema de indicadores para a avaliação das atividades de Turismo Criativo desenvolvidas em quatro regiões de Portugal através dos projetos piloto do CREATOUR. É um estudo quantitativo baseado em fontes primárias e secundárias. A Análise envoltória de dados foi utilizada para avaliar a eficiência desses projetos como unidades de tomada de decisão. A análise de dados foi realizada usando o Excel e o software EMS. Os resultados mostram que o nível geral de eficiência do turismo é relativamente alto e a maioria dos pilotos em cada região tem eficiência total. No entanto, ainda há espaço para melhorias em alguns deles. Com base nos resultados deste estudo, os profissionais portugueses do turismo criativo precisam prestar mais atenção ao capital social e à criação de empregos como os fatores que têm maior impacto na melhoria da eficiência. Este é o primeiro estudo a avaliar a eficácia de um projeto piloto em turismo criativo. Portanto, os resultados deste estudo podem abrir caminho para a implementação de projetos de Turismo Criativo noutras partes do mundo.

Palavras-chave: DEA, Turismo Criativo, Eficiência, Turismo.

1. Introduction

The international tourism market has experienced increasing competition in recent years (F. Blancas, Lozano-Oyola, González, Guerrero, & Caballero, 2011; Sharpley, 2020). Cultural tourism is one of the segments of the tourism sector that contributes significantly to the economic development of tourism destinations. In the era of 'the experience economy', tourists are becoming more active and looking for new experiences. They are looking for holiday experiences that change their lives, not just a variety of entertainment experiences (Chang, F. Backman, & Chih Huang, 2014; Remoaldo, Serra, et al., 2020). Destination marketers are finding it increasingly difficult to succeed due to increased competition and the development of undifferentiated cultural products (Ali, Ryu, & Hussain, 2016; De Bruin & Jelinčić, 2016). The concept of creativity, widely used in tourism literature today, is defined as how "(...) cities that harbour the entire range of cultural heritage events and actors can be re-designed and regenerated as creative cultural spaces using all their tangible and intangible cultural assets" (Remoaldo, Ghanian, & Alves, 2020; Salman, 2010). Creative tourism is thus linked to culture, and cultural expressions are expected to be unique and offer tourists an authentic engagement with the genuine cultural life of the place (Remoaldo & Cadima-Ribeiro, 2019).

Contemporary societies are moving towards an economy whose driving forces are cultural competence combined with

human and organisational creativity (Duff & Sumartojo, 2017). According to UNESCO (2006: 3), creative tourism is defined as "travel directed toward an engaged and authentic experience, with participative learning in the arts, heritage, or special character of a place, and it provides a connection with those who reside in this place and creates this living culture" (Network, 2006). Creative tourism was first defined by Richards and Raymond, in 2000, as an extension or response to cultural tourism (Duxbury, 2021). They defined creative tourism as "tourism which offers visitors the opportunity to develop their creative potential through active participation in learning experiences which are characteristic of the holiday destination where they are undertaken". Thus, the basic concepts of creative tourism refer to the experiences of tourists learning from the traditional and cultural context of the environment (Ferreira & Sousa, 2020). The concept of creative tourism refers primarily to the attitude of active tourists who seek to learn from new cultural experiences, especially their tangible aspects, such as handicraft production (Remoaldo et al., 2019). The need for learning can focus on various local activities and the use of local capacities (Serra, Marujo, & Duxbury, 2021). This type of tourism brings revenue to the local community and leads to a close relationship between host and guest (Remoaldo, Matos, et al., 2022; Richards & Wilson, 2006). Creative tourism, based on deep communication between guest and host, brings economic benefits to the host community, and guests also learn about local capacities that they can appreciate (Bastenegro &



Hassani, 2019; Blapp & Mitas, 2018). Richards and Wilson (2006) emphasise that for successful implementation in a region, it is important to determine the relationship between the resources of that area and tourists' needs. This highlights the link between supply and demand. Creativity and its corollary – innovation - require a suitable environment and sufficient resources (Chesbrough, Lettl, & Ritter, 2018).

Moreover, the ability to participate is a prerequisite for creativity (Lee et al., 2020). A creative organisation is characterised by a certain degree of informality, a good team spirit and management's confidence in the competencies of its employees (Mallett & Wapshott, 2014; Merkel, 2019). According to Håkansson & Snehota (1995), the mobilisation of a company's various stakeholders and the development of cooperative attitudes and mechanisms in this interaction with others seem to play a crucial role in the development of the destination (Cited in Lazzarotti & Petrillo, 2006). From a business perspective, it is clear that cultural tourism needs more interactivity and creativity to meet the needs and desires of today's consumers (Al-Ababneh & Masadeh, 2019; Triarchi & Karamanis, 2017). In response to the emergence of creativity in tourism development and marketing, destination organisations have begun to plan and act in line with creativity movements to develop unique cultural, social and physical features and gain competitive advantages (Al-Ababneh & Masadeh, 2019; Buchanan, 2015). Although creative tourism is presented as the latest development or extension of cultural tourism, it does not imply mass tours to cultural attractions. Creative tourism focuses on coming up with credible and creative experiences in tourism destinations, largely due to the active engagement of visitors and the local community (Chang et al., 2014; Dias, González-Rodríguez, & Patuleia, 2021). So far, elements of the creative industries have not been widely used in the local tourism offer. A large number of creative people living and working in the area (e.g., musicians, writers, actors, painters, sculptors) could play a role in the explicit visitor experience. In addition, creative elements could also be incorporated into destination development and management efforts to ensure success in the increasingly intense competition among destinations (Galvagno & Giaccone, 2019). Many countries, such as Singapore, New Zealand, and South Africa, are eager to develop creative tourism (MOND, 2007). Compared to other traditional forms of cultural tourism, creative tourism seems to meet the needs of tourists seeking a more active and longer-lasting form of experience (Richards & Wilson, 2006).

In Portugal, a project called CREATOUR was implemented between 2016 and 2020 to connect the cultural/creative and tourism sectors by developing an integrated research and application approach to acting as a catalyst for creative tourism in small cities and rural areas throughout Portugal. As a pioneering project in Portugal dealing with creative tourism and paying attention to less urbanised areas, it is worth evaluating the efficiency of the CREATOUR project among the pilot studies. So, that became the main purpose of this study. The secondary

objectives were to: i) Identify the efficiency indicators of creative tourism; ii) Measure the status of the indicators of the CREATOUR project through a questionnaire and checklists; iii) Assess the relative efficiency of the CREATOUR project's pilots; iv) Compare and prioritise the relative efficiency of creative tourism among the CREATOUR project's pilot studies.

Previous studies emphasise that it is difficult to determine true measurable benchmarks for tourism, such as banking services, and therefore other factors and variables should be used to evaluate its performance. In this context, several organisations use proxy variables to evaluate services. In order to evaluate tourism performance and avoid such problems, it is possible to use the efficiency evaluation method developed in Charnes, Cooper, and Rhodes (1978) (CCR) and promoted by Farrell's studies (1957) using data envelopment analysis (DEA) (Banker, Emrouznejad, Bal, Alp, & Cengiz, 2013). DEA is a multi-factor model that aims to evaluate the relative efficiency of a homogeneous set of decision-making units (DMUs) and uses inputs and outputs to evaluate efficiency. This technique has been used in recent studies to evaluate the efficiency of various types of tourism (e.g., (Martín, Mendoza, & Román, 2017; Nurmatov, Lopez, & Millan, 2021; Radovanov, Dudic, Gregus, Marcikic Horvat, & Karovic, 2020; Ruan, Li, Zhang, & Liu, 2019). Therefore, this study proposes a performance evaluation of the CREATOUR project in Portugal with DEA, using input and output constructs.

2. Theoretical framework

2.1 Tourism efficiency evaluation process

Important reasons for evaluating tourism efficiency include the fragile environmental and cultural sensitivity of tourist attraction sites (Phucharoen & Sangkaew, 2020). To prevent damage, it is necessary to continuously monitor and evaluate the impact of tourism (Jurigová & Lencséssová, 2015; McComb, Boyd, & Boluk, 2017). In addition, tourism's dynamic, unsustainable, and unpredictable nature requires evaluation and monitoring of its progress (Ko, 2005; H. Zhang, Ghoochani, Pan, & Crotts, 2016).

In 2019, tourism directly and indirectly accounted for about 10.4 % of the world's gross domestic product and became one of the most important sources of employment in the world (WTTC, 2019). However, despite its economic benefits, tourism must respond to its negative effects on society and the environment (Y. Huang & Coelho, 2017). When measuring the efficiency of the tourism sector – at the local, national, or global level, and even at the level of tourism sites - the focus has traditionally been on the economic and financial aspects (Choi & Sirakaya, 2006; Pulido-Fernández, Andrades-Caldito, & Sánchez-Rivero, 2015). However, tourism infrastructures and facilities, as well as the activities carried out by tourists, have a variety of positive and negative effects (Călina, Călina, & Tiberiu, 2017). Consequently, a new approach should be used to identify and assess all tourism's effects on a particular region or community.



2.2 Indicator-oriented system for evaluating tourism efficiency

In the field of tourism development, indicators are a set of information selected for a specific purpose and to measure changes in assets and issues selected for the development and management of tourism in a particular destination (J. Zhang, Ji, & Zhang, 2015). The indicators are known as desirable tools or measurement criteria for evaluating and monitoring progress (Francisco J Blancas, Lozano-Oyola, González, & Caballero, 2016). However, Ko (2005) has shown that it is very difficult to find a practical study that systematically evaluates the efficiency of tourism development. The results show that the studies are mainly descriptive and subjective, relying heavily on qualitative data. Although the prevailing opinion on each set of indicators differs, they become operational when used in policymaking. Also, Veenhoven (2001, cited by Ercsey, 2012) stated that the combination of objective and subjective indicators can balance the weaknesses of both types and provide better and more accurate information for the decision-making process.

It should be remembered that the final choice of indicators affects the primary goal (Torres-Delgado & Palomeque, 2014; White, McCrum, Blackstock, & Scott, 2006). Therefore, they should be selected depending on the region's characteristics where the indicators will be used. The presence of such indicators is very important because it allows to compare the current situation with the future situation (Francisco Javier Blancas, González, Lozano-Oyola, & Pérez, 2010). Nevertheless, in each destination, specific data and information can be used to indicate whether or not it is related to the research topic.

All systems must be aware of their ability to achieve their specific goals and future developments. This awareness informs them of their strengths and weaknesses and identifies strategies to improve their performance and progress. Once indicators have been selected, a method must be chosen to evaluate the multidimensional performance of tourism. Numerous methods have been developed to address different aspects of assessing sustainable tourism or its performance. Some of these methods summarise sustainability in terms of a general picture, while others consider specific dimensions such as the Ecological Footprint (Collins & Cooper, 2017; Gössling, Hansson, Hörstmeier, & Saggel, 2002), the Systemic Approach (Núñez-Ríos, Sánchez-García, & Tejeida-Padilla, 2020), or Data Envelopment Analysis (DEA) (C.-W. Huang, 2018; Karakitsiou, Kourgiantakis, Mavrommati, & Migdalas, 2020). What is more commonly used today in sustainable tourism development studies is the analysis of the performance of sustainable tourism due to its relative nature and the creation of a reference point for the evaluation of development actions. Based on this ability, this method was used in this study to evaluate the efficiency of creative tourism performance, which is explained in detail below.

2.3 Data Envelopment Analysis (DEA)

Efficiency can be defined as the best practical behaviour observed by each company in the industry. Therefore, companies are compared with each other in terms of their performance. This view of efficiency has paved the way for practical measurement methods and has given rise to the concept of frontier functions. One of the most recent methods that has received considerable attention in tourism studies is the measurement of the efficiency of tourism development performance.

According to this, a unit is classified as efficient if it produces so much with its resources that, in the current situation, production beyond this level is impossible, and the output cannot be achieved with one less input unit. Data envelopment analysis is one of the non-parametric methods for evaluating the performance of decision-making units (DMUs) that can measure performance with multiple inputs and outputs. DEA uses all the information, which is called comprehensive or "envelopment" (Foo & Othman, 2011). It applies mathematical programming techniques to compare the efficiency of a set of decision-making units (DMU) (Dotoli, Epicoco, Falagario, & Sciancalepore, 2015). The efficiency score of each DMU is defined as the ratio of the weighted sum of its outputs to the weighted sum of its inputs. The DEA model generates the weights of the inputs and outputs and the relative efficiency scores. The values range from 0 (inefficient) to 1 (fully efficient) (Colbert, Levary, & Shaner, 2000; Liu & Peng, 2008; Visbal-Cadavid, Mendoza, & Hoyos, 2019). Therefore, decision-making units are divided into two categories - efficient and inefficient - depending on their efficiency score. Efficient units are units whose efficiency score equals one (Adler, 2002).

A. Data envelopment analysis assuming constant and variable returns to scale

The constant returns to scale (CRS) method assumes that when inputs increase by a certain ratio, outputs also increase by the same ratio. The variable returns to scale (VRS) method assumes that when inputs increase by a certain ratio, outputs increase by either a larger or a smaller proportion, in which case the returns to scale are classified as Increasing Returns to Scale (IRS) or Decreasing Returns to Scale (DRS) (Lo Storto, 2013).

B. Measuring efficiency with an input/output-oriented approach

Efficiency is defined as the relationship between inputs and outputs. Hence, the general DEA evaluates efficiency. Each data envelopment analysis model has two axes of investigation (the output and input). The term "output-oriented" refers to how much the output should be increased while the quantity of inputs remains constant for the unit to meet the efficiency limit. In other words, production can be increased to this extent without requiring more factors of production. The term "input-oriented" refers to how much inputs should be reduced while the quantity of outputs remains constant so that the unit



reaches the efficiency limit (Jacob, Onadeko, Nelson, & Shotuyo, 2020). In socio-economic studies, the input-oriented model is usually used because it is impossible to change the outputs.

3. Material and Methods

3.1 The study area

CREATOUR ("Creative Tourism Destination Development in Small Cities and Rural Areas") was an incubator/demonstration and multidisciplinary research initiative that supported collaborative research processes which began in late 2016 and ended in June 2020. This project aimed to connect the cultural/creative and tourism sectors through the development of an integrated research and application approach to act as a catalyst for creative tourism in small cities and rural areas throughout Portugal (<https://ces.uc.pt/en/investigacao/projetos-de-investigacao/projetos-financiados/creatour>). It included 40 pilot projects/partnerships in mainland Portugal that diversify the tourism offer and deepen the links between cultural/creative and tourism organisations in these areas. The project aimed to develop a sustainable creative tourism sector to boost tourism in small cities and rural areas and contribute significantly to local

cultural vibrancy and holistic development in pilot communities. Of the 40 CREATOUR pilots, 28 managers participated in this study. An attempt was made to distribute the pilots across all regions. Their names can be found in Table 2.

3.2 The methods used

This is a quantitative study based on primary and secondary sources. When using DEA to evaluate efficiency, DMUs should meet the criteria established by Golany and Roll. DMUs must have the same goals, perform similar work, and operate the same input and output items in the same market. In this context, CREATOUR's pilot projects were considered DMUs. Technical efficiency, which measures DMU performance, is used in this study to evaluate the efficiency of CREATOUR project performance based on the CCR model. A total of 39 organisations in the four regions of mainland Portugal (Norte, Centro, Alentejo and Algarve) were studied. The DEA model considered the following inputs: "Institutionalisation", "Job Creation", "Tourist Attraction", "Social Capital", "Marketing" and the "Number of Events" held by the pilots. On the other hand, the considered outputs were "Tourist Evaluation" and "Evaluation of Pilot Managers" (Table 1).

Table 1 - Criteria Characteristics

Criteria	Definition	Role in DEA Model	Source of Data
Networking	A form of partnership involving different interacting elements, which include enterprises, institutions and the host community (Tinsley and Lynch, 2007).	Input	Interview with managers
Job creation	Number of direct and indirect jobs created by the pilots in the CREATOUR project	Input	Interview with managers
Tourist attraction	Facilities that principally provide recreation, amusement, or leisure activities to the general public, with the majority of its visitors not residing in the immediate area of the attraction (Law Insider).	Input	Interview with managers
Social capital	Social capital improves human relations and people's adherence to social norms by creating mutual trust and involving people in human networks. Communities with higher social capital have lower crime and social crime as a result of increased trust and moral behaviour. Also, with the increase of social capital, the security of society has improved, which provides the ground for attracting more and more tourists (Sabatini, 2009).	Input	Interview with managers
Marketing	Travel and tourism marketing is the systematic and coordinated execution of business policies by both private or public and public sector tourism organisations operating at the local, regional, national, or international level to achieve the optimal satisfaction of the needs of identifiable tourist groups and individuals (Dai et al., 2019).	Input	Interview with managers
Number of events	Number of events held by pilots such as: Festivals, Fairs, etc.	Input	Interview with managers
Overall tourists evaluation	Tribe and Snaith (1998) defined tourists' satisfaction with a destination as the degree to which a tourist's assessment of the attributes of that destination exceeds his or her expectations for those attributes (Sukiman et al., 2013).	Output	Survey
Overall managers evaluation	Pilot managers evaluate the performance of their association with the CREATOUR project, which is measured through a direct question with a quantitative scoring between 0-10.	Output	Interview with managers

Source: Authors' elaboration, taking into consideration several authors.

The data for this study were collected through semi-structured interviews with pilot managers, conducted mainly via Skype due to the pandemic period in 2020 and 2021. The interviews were conducted to evaluate the performance of each of the study pilots. The 13 questions focused on their view and evaluation of their activities in the form of a creativity project.

A checklist of initial questions was created to conduct the interview. Then, during the interview, the managers of the

pilots were asked about the questions on the checklist. In this way, the authors sought to obtain not only the necessary statistics and information but also the views of the managers of the pilots to understand in detail the strengths and weaknesses of each factor. All managers were invited to participate in the survey. Due to COVID-19 restrictions and the suspension of some of the activities, some of the managers were unable to participate in the interview, and others were unavailable. Finally, 28 pilot managers were interviewed (Table 2).

**Table 2 - Pilot projects studied**

Region	Pilot name	Code
NORTE	ADERE - Peneda-Gerês	N1
	LRB - Investimentos e Consultoria, Lda.	N2
	Motivos e Memórias Unipessoal, Lda. (brand: VERde NOVO)	N3
	Municipality of Amares	N4
	Municipality of São João da Madeira	N5
	Galandum Galundaina - Associação Cultural	N6
	ADRAT – Alto Tâmega Region Development Association	N7
	Municipality of Bragança	N8
	Municipality of Esposende	N9
	Desteque –Terra Quente Transmontana Development Association	N10
CENTRO	Associação Luzlinar	C1
	Mosaico – Conimbriga e Sicó	C2
	Associação Destino Caldas	C3
	Tecitex (New Hand Lab) + Museu Lanifícios UBI	C4
	Municipality of Abrantes	C5
ALENTEJO	Municipality of Mértola	ALE1
	Centro de Estudos de Cultura, História, Artes e Patrimónios (CECHAP)	ALE2
	LOOM New.Tradition	ALE3
	Municipality of Beja	ALE4
	Municipality of Reguengos de Monsaraz	ALE5
	Genuine Alentejo – Portugal’s Remarkable Tourist Experiences	ALE6
	Trilhos e Petiscos, Animação Turística, Lda (Vagar Walking Tour)	ALE7
	Marca – Local Development Association	ALE8
ALGARVE	Odiana – Baixo Guadiana Development Association	ALG1
	Municipality of Loulé	ALG2
	Proactivetur	ALG3
	Tertúlia Algarvia	ALG4
	Centro Ciência Viva do Algarve	ALG5

Source: Authors' elaboration, considering the data from the CREATOUR Project.

The data on tourist evaluation were taken from the survey conducted in 2018 and 2019 as part of the CREATOUR Project. Data were collected from 815 tourists in all pilot projects of the study. Data analysis was performed using Excel and EMS software.

4. Results and discussion

The results of the collected data were analysed and are presented in this item along with the input factors of the data envelopment analysis model (Table 3).

Table 3 - The score values of the input factors

Region	Code	Score					
		Institutionalisation	Job creation	Tourist attraction	Social capital	Marketing	Number of events
NORTE	N1	0	20	50	56	8	5
	N2	0	0	15	24	5	4
	N3	0	0	20	22	8	5
	N4	0	20	150	557	14	6
	N5	1	0	80	25	3	10
	N6	0	0	200	46	4	3
	N7	0	0	60	140	10	4
	N8	0	5	82	37	7	2
	N9	0	5	82	69	8	5
	N10	0	0	82	44	7	2
CENTRO	C1	0	0	50	54	10	8
	C2	1	3	15	13	9	5
	C3	0	1	8	16	6	3
	C4	0	5	40	32	12	3
	C5	1	0	100	109	13	7
ALENTEJO	ALE1	1	0	80	25	3	10
	ALE2	1	0	100	7	10	10
	ALE3	0	0	0	105	7	4
	ALE4	0	1	15	27	7	7
	ALE5	0	5	148	9	7	9
	ALE6	5	0	6	38	7	9
	ALE7	0	0	77	31	7	10
	ALE8	0	0	190	24	7	10
ALGARVE	ALG1	0	0	7	20	6	5
	ALG2	2	18	3	8	16	5
	ALG3	0	5	4	32	5	5
	ALG4	0	0	0	110	7	4
	ALG5	0	5	0	13	5	3

Source: Authors' elaboration.



As can be seen in Table 3, a limited number of the pilots studied have proved successful at the institutionalisation factor. In other words, all of the pilots had significant shortcomings in institutionalisation and were unable to create appropriate institutions to develop their activities. The results show that institutionalisation is most prevalent in the Alentejo region, with three pilots. These pilots are the “Municipality of Mértola”, “Centro de Estudos de Cultura, História, Artes e Patrimónios (CECHAP)” and “Genuine Alentejo – Portugal’s Remarkable Tourist Experiences”. Thus, in a research conducted to identify the factors that influence sustainable tourism, Esmailzadeh and Esmailzadeh (2018) concluded that institutionalisation is a positive influencing factor. Hjalager (2009) examined the relationships between innovations in travel medicine and the progress of tourism. The author found that there is limited insight into the relationship between innovations and developments in medicine on the one hand and tourism economics and institutionalisation on the other. It was also noted that innovations in the medical field and institutionalisation of the use of medicine can influence the development of tourism and tourism economics. Regarding job creation, the results show that the pilots, “ADERE - Peneda-Gerês” and “Municipality of Amares”, were able to create a total of 20 jobs in their area. Accordingly, Mirzaie, Salimi, and Rahimi Sarshabadrani (2022) studied the role of sports tourism development in job creation and found that sports tourism had a positive and significant effect on indirect job creation and all its dimensions. They found that the development of sports tourism may help increase direct and indirect jobs and permanent, seasonal, and part-time

employment. Also, Leonard (2016) examined job creation in coal exploration activities and tourism development in Southern Africa. This research showed that besides the short-term jobs that mining provides, the precautionary principle should apply to mining given the added risk of serious or irreversible environmental degradation that does not support sustainable tourism development and long-term jobs. The results show that the highest-rated tourist attractions are related to the pilots, “Galandum Galundaina - Cultural Association” and “Marca - Local Development Association”. The most social capital is found in the Municipality of Amares pilot. In this way, McGehee, Lee, O’Bannon, and Perdue (2010) researched the view of tourism stakeholders in a four-county region in Virginia. They found a relationship between length of residence and tourism-related social capital, as well as between tourism-related social capital and cultural capital, political capital, human capital, private built capital, and financial capital. Also, Claiborne (2010) researched the role and value of social capital in community tourism development and found that communities with high social capital and capable stakeholders have better conditions for development. According to the results, the pilot “Municipality of Loulé” made more efforts in marketing than the other pilots. The pilots “Municipality of São João da Madeira”, “Municipality of Mértola”, “Centro de Estudos de Cultura, História, Artes e Patrimónios (CECHAP)”, “Trilhos e Petiscos, Animação Turística, Lda (Vagar Walking Tour)” and “Marca - Local Development Association” have carried out the most events. The results of the output part of the data envelopment analysis model can be seen in Table 4.

Table 4 - The score values of output factors

Region	Code	Score		
		Overall tourists’ evaluation (Range: 9-45)	Tourists’ loyalty (Range: 3-15)	Overall managers’ evaluation (Range: 0-10)
NORTE	N1	34	13	8
	N2	38	14	7
	N3	35	14	7
	N4	33	13	7
	N5	36	14	7
	N6	37	14	8
	N7	41	14	9
	N8	41	14	8
	N9	39	14	7
	N10	37	15	8
CENTRO	C1	33	14	10
	C2	37	14	10
	C3	32	13	5
	C4	35	14	7
	C5	37	14	10
ALENTEJO	ALE1	33	14	7
	ALE2	32	14	9
	ALE3	22	12	1
	ALE4	32	14	3
	ALE5	35	14	10
	ALE6	32	14	8
	ALE7	32	14	6
	ALE8	39	14	6
ALGARVE	ALG1	35	14	7
	ALG2	43	15	7
	ALG3	40	14	7
	ALG4	41	15	1
	ALG5	40	14	7

Source: Authors’ elaboration.



The lowest tourist score is for LOOM New.Tradition, a pilot in the Alentejo region. The results also show that tourists' satisfaction with all the studied pilots was higher than their mean satisfaction level (mean=18). Additionally, it showed a high degree of loyalty of tourists who would revisit the destination or introduce the pilots to their friends and acquaintances. The results also showed that the pilots LOOM

New.Tradition and Tertúlia Algarvia were rated as the most unsuitable by the managers.

The data envelopment analysis method and EMS software were used to evaluate the performance of the study pilots in different parts of Portugal based on the information obtained from the field survey. The performance results of creative tourism in the studied pilots are presented in Table 5.

Table 5 - Evaluation of the relative efficiency of creative tourism in the pilot projects studied

Region	DMUs Pilot	Performance rating	Rank
Norte	ADERE - Peneda-Gerês	0.71	6
	LRB - Investimentos e Consultoria, Lda.	1.00	1
	Motivos e Memórias Unipessoal, Lda. (marca VERde NOVO)	0.98	2
	Municipality of Amares	0.40	11
	Municipality of São João da Madeira	1.00	1
	Galandum Galundaina – Cultural Association	1.00	1
	ADRAT – Alto Tâmega Region Development Association	1.00	1
	Municipality of Bragança	1.00	1
	Municipality of Esposende	0.59	10
Centro	Desteque – Terra Quente Transmontana Development Association	1.00	1
	Associação Luzlinar	0.70	7
	Mosaico – Conimbriga e Sicó	1.00	1
	Associação Destino Caldas	0.92	3
	Tecitex (New Hand Lab) + Museu Lanifícios UBI	0.84	5
Alentejo	Municipality of Abrantes	0.62	9
	Municipality of Mértola	1.00	1
	Centro de Estudos de Cultura, História, Artes e Patrimónios (CECHAP)	1.00	1
	LOOM New.Tradition	1.00	1
	Municipality of Beja	0.33	12
	Municipality of Reguengos de Monsaraz	1.00	1
	Genuine Alentejo – Portugal's Remarkable Tourist Experiences	1.00	3
	Trilhos e Petiscos, Animação Turística, Lda (Vagar Walking Tour)	0.64	8
Marca – Local Development Association	0.88	4	
Algarve	Odiana – Baixo Guadiana Development Association	1.00	1
	Municipality of Loulé	1.00	1
	Proactivetur	1.00	1
	Tertúlia Algarvia	1.00	1
	Centro Ciência Viva do Algarve	1.00	1

Source: Author's own elaboration.

The above-mentioned performance results show that the pilots of LRB - Investimentos e Consultoria, Lda, the Municipality of São João da Madeira, Galandum Galundaina - Cultural Association, ADRAT - Alto Tâmega Region Development Association, and AMTQT - Terra Quente Transmontana Development Association, all located in the Norte region; the pilot of Mosaico - Conimbriga e Sicó in the Centro region; the pilots of the Municipality of Mértola, CECHAP, LOOM New.Tradition, the Municipality of Reguengos de Monsaraz, Portugal Experiences, in the Alentejo region; and all the pilots of the Algarve have performed efficiently.

Among the studied pilots, the ones from the Municipality of Amares, Municipality of Esposende and Municipality of Beja were identified as the most inefficient pilots, based on the performance evaluation indicators of creative tourism. In the case of the Municipality of Beja, the reason was that the project was evaluated as unsuccessful by its manager. The manager believed that there had been difficulties, especially in the promotion of the product:

"Until today, it was practically impossible to get any feedback from the tour promoters/organisers. Apart from the interest of the company Spira, which will integrate this offer into its itineraries, no other promoter has shown any interest. We think that maybe we have not insisted enough. We do not believe that the offer is badly made. Perhaps the reasons for this lie in the type of visitors who come to Beja, mostly passing through, and the relatively small number of tourists. As an example, we can cite the Cooking Workshops that had to be booked in advance and had a minimum number of participants. The consultation to be carried out only a few hours in advance made it logistically impossible to implement the initiative. This delay in the perception of the offer, which was only felt once the visitors were on site, was an important factor in the failure of the programme so far."

In the case of the Municipality of Amares, the low satisfaction of tourists with the activities offered and attended was the



main factor for the poor evaluation of this pilot project. On the other hand, for the Municipality of Esposende, the shortcomings in institutionalisation, use of social capital and job creation were major factors in its low evaluation.

The results of explaining the optimisation status of each input of the data envelopment analysis model showed that, of all the pilots studied, the social capital and job creation components will have the greatest impact on the performance of creative tourism. After these two components, tourism attractiveness is the third component that influences the development of creative tourism in the studied regions. Accordingly, in the case

of appropriate planning to manage the development of creative tourism in the pilots studied, particular attention should be paid to these three components.

The results of the optimisation situation in the studied regions show that in the Norte region, the job creation component has the greatest impact on the development of creative tourism. In the Centro region, the institutionalisation component has the greatest impact on the performance of creative tourism. Table 6 highlights that the tourist attraction component has the greatest impact on the performance of creative tourism in the Alentejo and Algarve regions.

Table 6 - The optimisation status of each input of the data envelopment analysis model

Region	Institutionalisation	Social Capital	Job Creation	Marketing	Tourist attraction	Events
Norte	0%	59.5%	71.6%	22.04%	18.04%	16.18%
Centro	49.8%	40.3%	22.34%	33.08%	28.20%	21.98%
Alentejo	0%	12%	11.1%	17.3%	41.05%	26.29%
Algarve	0%	10.38%	0%	0%	29.09%	9%
Total	8.3%	44.2%	41.3%	19.4%	27.9%	20.4%

Source: Authors' elaboration.

5. Conclusions

Based on the above analyses and following the DEA model, this research measured and evaluated the tourism efficiency of 28 pilots of the CREATOUR project. The results show that the overall level of tourism efficiency is relatively high, with most pilots in each region achieving full efficiency. However, there is still room for improvement in some pilots. CREATOUR's efficiency varies greatly among the different coastal areas. The efficiency scores of the 'Municipality of Amares', 'Municipality of Esposende' and 'Municipality of Beja' are relatively low.

The study results show that the pilots are the most efficient in terms of institutionalisation, which means that several aspects should be taken into account to effectively improve the overall level of tourism efficiency and the quality and efficiency of the tourism industry under the CREATOUR project. This was highlighted in another study (Simpson, 2008). In tourism, there are various interconnected sectors with efficient formal and informal organisations that communicate and cooperate well. It brings us back to the question of networking (Waligo, Clarke, & Hawkins, 2013). Networking and networks are very important for the tourism sector and allow for more inclusive, informed, participatory and democratic tourism planning by various stakeholders.

Based on the findings of this study, creative tourism stakeholders in Portugal should pay more attention to social capital and job creation as the most influential factors for improving efficiency, i.e., a creative tourism activity must not only focus on providing tourists with the opportunity to engage in creative activities but also be able to secure the support, trust and participation of the local community and successfully create jobs there. In addition, creative tourism should be able

to play a role in improving lifestyles by providing channels for dialogue and negotiation among stakeholders and strengthening the social capital of local communities. This was highlighted as one of the study's findings conducted in rural areas of China (Zhou, Tang & Zou, 2019).

The regional analysis of the projects studied showed that the main weakness of the pilots in the Norte region was in the use of social capital and job creation. The study's results also showed that the institutionalisation factor has the greatest impact on the efficiency of creative tourism activities in the Centro region. Meanwhile, the Alentejo region has the lowest performance in terms of tourist attraction and event factors.

The coordinators and managers of the pilots should also consider making more efforts not only in conducting marketing activities and introducing pre-existing capabilities but also in developing them to attract more promoters in the future.

This study has some limitations. In particular, the results of this study must be recognised as the outcome of a case study and can only be extended to the territory of four studied regions in Portugal. Further extensions to other regions are needed to make generalisations about creative tourism. The main limitation we faced was the outbreak of the COVID-19 pandemic during the period of data collection. Another limitation was the pilot managers' concern about being evaluated by an external element, although they were assured during the interview that the study would focus on evaluating CREATOUR activities rather than all pilot activities.

This study examined aspects of the performance of the participating pilots in the CREATOUR Project, but undoubtedly needs more time to conduct related activities and determine the long-term impact of CREATOUR interventions, especially



after the end of the COVID-19 pandemic. However, the study suggests the use of other performance evaluation methods in addition to the Data Envelopment Analysis (DEA). Also, it would be helpful for future studies to compare different techniques.

Authorship Contribution Statement

M.G.: Conceptualisation of DEA technique for evaluation the efficiency of CREATOUR pilots, writing the original draft, editing. **P.R.:** Conceptualisation of the Creative Tourism, coordination with pilot's coordinators, editing, supervision of research process. All authors have read and agreed to the published version of the manuscript.

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