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Tourism Sector **Competitiveness** in Central Portugal Following the 2017 **Forest and Rural Fires: Evaluating the Situation and its Future Implications**

A Competitividade do Setor do Turismo no Centro de Portugal Após os Fogos Florestais e Rurais de 2017: Avaliação da Situação e Implicações Futuras

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Abstract | With the tourism sector playing an extremely relevant role as a tool for competitiveness and a driver of regional development and with tourist destinations facing increasing numbers of events beyond their control and potentially compromising their competitive and comparative advantages, it thus becomes pertinent to examine the ways in which the forest and rural fires of 2017 impacted on the competitiveness of the Centro Tourism Region. To this end, we applied a quantitative methodology with secondary data that enabled us to ascertain the burned area in each council, the influence on tourist numbers in the region during and after the natural disaster as well as any losses in regional competitiveness. The conclusions returned enabled the affirmation of this region's strong comparative and competitive advantages that ensured the minimisation of the risk of losing tourism sector competitiveness.

Keywords | Tourism, Competitiveness, Natural Disasters, Forest and Rural Fires, Centro Region of Portugal

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Resumo | Sendo o turismo um setor que possui um papel extremamente relevante como ferramenta de competitividade e motor de desenvolvimento regional e existindo cada vez mais acontecimentos que ocorrem fora do controlo nos destinos turísticos comprometendo as suas vantagens competitivas e comparativas, torna-se pertinente examinar de que forma a competitividade da região do Turismo Centro Portugal foi afetada pelos fogos florestais de 2017. Para tal, foi utilizada uma metodologia quantitativa com dados secundários que nos permitiram averiguar a área ardida por concelho, a sua influência na afluência turística da região durante e após o desastre natural, bem como o grau de perda de competitividade do território. As conclusões encontradas permitem-nos afirmar que o facto de a região possuir fortes vantagens comparativas e competitivas, fez com que fosse minimizado o risco de perda de competitividade do território.

Palavra-chave | Turismo, Competitividade, Desastres Naturais, Fogos Florestais e Rurais

1. Introduction

Tourism is currently a sector experiencing major growth at the global level and a key driver of economic and socioeconomic growth in both developed and developing countries (Brandão, Breda, & Costa, 2019; Brita & Zapata, 2010; Crouch & Ritchie, 1999; Fu, Ridderstaat, & Jia, 2020; Kongprasert & Virutamasen, 2015; C. Tang & Tan, 2013; Wamboyea, Nyarongab, & Sergic, 2020). The accelerated growth of this sector over the last decade has derived from increases in the prevailing level of competitiveness (Assaf, 2012; Crouch, 2007), with this a determinant factor for tourist destination levels of performance (Pike & Page, 2014). However, according to Malakauskaite and Navickas (2010), tourism sector competitiveness, as indeed with any other economic sector, is not separable from the harmonious and sustainable development of tourist destinations. Tourism development should thus be sustainable not only economically but also in social, technological, natural, ecological and cultural terms (Crouch and Ritchie (1999); Malakauskaite and Navickas (2010). Crouch and Ritchie (1999) state that the development of the tourism potential of any country or region depends strongly on the capacity to maintain competitive advantage in the provision of goods and services to visitors as well as the capacity of the environmental conditions prevailing in the tourism market, tourism resources, the human resources and the tourism infrastructures of a country to generate added value and boost national income.

However, this needs to take into account how the contemporary world is subject to the inevitable threat of natural disasters such as extended droughts, fires, cyclones, floods, landslides, plagues of insects and so forth (Brown, 1989), with their seemingly random occurrence holding potentially devastating consequences and unpredictable effects with the tourism industry particularly susceptible (Cioccioa & Michaelb, 2007; Hall, 2010; Paraskevas & Altinay, 2013; Prideaux, Laws, & Faulkner, 2003). According to Clarke (2006), these disasters hold social and environmental implications for tourism that are going to become increasingly generalised and varied in the future and with Dahles and Susilowati (2015) even considering that natural disasters are now already a major challenge for local tourism in developing countries. This stems from how tourism, in addition to the main iconic attractions, represents an industry dominated by small and medium sized companies and with the nature of tourism environments frequently involving exposure to danger in keeping with the exotic, uncommon landscapes or especially volatile natural configurations sought after. In such contexts, whether in specific locations or throughout an en-

tire region, whenever natural events occur that are able to destroy the physical basis for the tourism activities ongoing, this threatens the very existence of these regional companies. In summary, at any moment, the unexpected might impact on the entire viability of the business through the damage caused to the surrounding tourism environment and resulting in long term consequences especially for rural areas where tourism has evolved as an important factor contributing towards local economic wellbeing (Cioccioa & Michaelb, 2007) and throwing into jeopardy the entire competitiveness of the region.

The Centro Region of Portugal, a region characterised by its mountainous terrain with rugged relied and large forested and rural areas, with extensive plantations of pine and eucalyptus trees, has always been a regional tourist destination highly susceptible to periodic natural catastrophes, especially forest fires (Almeida, 2002-2004). However, despite such blazes having long since been deemed a routine danger for the region, the 2017 forest and rural fires were an unprecedented natural disaster in terms of their scale, including consequences such as the loss of life, mass physical destruction of its botanical complexes and their respective fauna ranked as of great environmental, economic and tourist interest and with major socioeconomic impacts on persons that exposed them to vulnerable situations (CTI, 2017).

Despite the rising global interest in the impacts of these natural disasters on tourism (Becken & Hughey, 2013), there is a gap in this research field in relation to Portugal and hence the relevance of examining the ways in which the events of 2017 impacted on the competitiveness of the Centro Tourism Region. Within this framework, we approach the following research questions:

Q1 – Does the scale of the area burned influence the tourist numbers visiting the region?

Q2 – Did the 2017 forest and forest and rural fires compromise the competitiveness of the Centro Tourism Region?

The structure of this article is as follows: the next section presents a literature review on tourism competitiveness, its measurement, the impact of natural disasters on tourism in addition to setting out some empirical evidence applied to forest and rural fires; subsequently, we provide a brief introduction to the region under study; and before the fourth section details the methodology applied, the data analysed and alongside a discussion of the results returned; before we finally put forward the conclusions, limitations and future lines of research.

2. Theoretical Framework

2.1. Tourism Competitiveness

Competitiveness may at first appear simple to understand, however, its complexity becomes clear when seeking to define and analyse the concept based on various sources from the literature (Cooke & Morgan, 1998; Desrochers & Sautet, 2004; M. Porter, 1994). M. Porter (1990) argues that its ambiguity stems from the enormous variety of definitions and the various perspectives on competitiveness that renders any exhaustive or undebatable definition extremely difficult. Nevertheless, in this author's vision, national competitiveness results from the competitiveness of its companies with this level of competitiveness interrelated with the ways in which their business models interact with their surrounding environment to produce products and services that add value. According to Casadesus-Masanell and Ricart (2010), the majority of the literature on competitiveness concentrates on a geographic unit – whether region, country or even cluster and has served in various different ways to

foster the emergence of virtuous cycles that enable companies to develop strengths that they may subsequently deploy to maintain their international competitiveness.

The competitiveness of the tourism industry is an equally complex and multidimensional concept (Wong, 2011) and, from the perspective of Bălan, Balaure, and Veghes (2009), recent years have seen this become one of the concepts most commonly applied to describe approaches to the sustainable development of tourist destinations. Part of this complexity derives from the nature suggested by the definition applied to the tourist destination, correspondingly perceived as a place or a form of a real or perceived boundary, such as the physical borders of an island, political boundaries or even the limitations established by markets (Kotler, Bowen, & Markens, 2006). This multidimensional nature extends to the countless definitions put forward by many different researchers. Crouch and Ritchie (1999), Heath (2003) and Bahar and Kozak (2007) define tourism competitiveness as the capacity of any destination to provide a high standard of living to the residents in the destination. According to Hassan (2000), this involves the destination's capacity to create and integrate added value products that sustain its resources while maintaining its market position in relation to the competitors. In turn, (C. Kim, 2000) proposes a definition of tourism sector competitiveness that encapsulates the capacity of the tourism market environmental conditions, tourism resources, human resources and the tourism infrastructures of a country to generate added value and boost national wealth. Furthermore, a truly competitive tourist destination is that which holds the capacity to raise the amount spent on tourism while attracting and satisfying increasing numbers of visitors, providing memorable experiences and doing so in a profitable fashion while still improving the wellbeing of destination residents and preserving the natural capital for future generations (Ritchie & Crouch, 2010). However, Webster and Ivanov (2014) consider that this is not always any linear process as according to their research findings, there may not be any statistically significant relationship between the competitiveness of tourist destinations and the contribution made by the sector to economic growth.

Dwyer and Kim (2003) add that tourism competitiveness combines various facets whether or not they are susceptible to observation and that are on many occasions not easy to measure. In order to compete within the tourism sector, a destination cannot only deploy comparative advantages but rather also needs competitive advantages, thus, actually possessing a variety of tourism products and resources is not only necessary but these also require due management in an effective and efficient manner over the medium and long terms. According to Tsai, Song, and Wong (2009), a destination is only ever competitive when able to attract and satisfy the potential tourists.

The competitiveness of the tourism sector involves a range of different factors such as the natural environment (geographic location, landscapes, climate, etcetera), the surrounding built environment (tourism transport, infrastructures for the provision of leisure and entertainment, services, retail outlets, hotel and accommodation networks) and the globalisation of markets (Navickas & Malakauskaite, 2009). Ritchie and Crouch (2010) furthermore conclude that these resources and attractions also deserve recognition as the competitive factors' determinant to the success or otherwise of tourist destinations. According to Malakauskaite and Navickas (2010), tourism sector competitiveness significantly contributes to economic development and susceptible to description as resulting from the synergies among the natural and human factors created by the tourist destination resources and determined by the prevailing capacity of firms to attract new visitors and boost their expenditure through the supply of quality goods and services as well as valuable experiences.

There have been many studies oriented towards evaluating the competitiveness of tourist destina-

tions (Cores, 2011; Cracolici, Nijkamp, & Rietveld, 2006; Croes & Kubickova, 2013; Crouch, 2007; Mazanec, 1995) in addition to research based on developing general models and theories for destination competitiveness (Crouch & Ritchie, 1999; Dwyer & Kim, 2003; Estevão, Nunes, Ferreira, & Fernandes, 2018; Ferreira, 2009; Heath, 2003; Malakauskaite & Navickas, 2010; Nunes, Estevão, & Filipe, 2018; M. Porter, 1990; Vengesayi, 2005). Out of all these models, the Diamond Model proposed by M. Porter (1990) differs from the others in considering the role of chance as an extremely important attribute of tourist destinations, thus incorporating the occurrence of events beyond the control of any firm, such as natural disasters.

2.2. Measuring the Competitive of Tourist Destinations

Gooroochurn and Sugiyarto (2005) approach competitiveness as a multidimensional and relative phenomenon with its measurement varying in accordance with the choice of the variables for analysis and/or the base year and/or the geographic scope (countries or regions) selected for analysis. The definition of competitive models for tourist destinations associated with competitive indicators enables the identification of the relative strengths and weaknesses of each different destination and eligible for application whether directly by the sector or by the governing authorities so as to boost income from tourism and the socioeconomic impacts generated by growth in this sector (Dwyer & Kim, 2003). Taking the same perspective, Z. Breda (2004) affirms that any perfect analysis of competition fundamentally requires the identification of the current and potential future competitors; their objectives and strategies; the positions and performances of each competitor in the respective product market; their weaknesses and strengths. This should also take into account factors such as climate, location, the quality/price relationship, marketing activities, the quality of tourism accommodation and the respective governmental support structures.

Thus, efforts to analyse and measure the competitiveness of tourist destinations become important and pertinent to the development of national competitive indicators able to grasp the motivations of tourists (Dwyer & Kim, 2003). These indicators may interrelate with subjective attributes (natural or cultural resources, tourism infrastructures, entertainment, quality of service, destination accessibility, hospitality, innovation, security, political stability), objectively determined attributes (tourism market share, tourism revenues, etcetera), and alongside indicators for socioeconomic prosperity (levels of economic productivity, levels of employment, income per capita, economic growth rate, etcetera).

Webster and Ivanov (2014) propose the measuring of tourist destination competitiveness through the Travel & Tourism Competitiveness Index that spans a range of factors and policies that enable the sustainable development of this sector of the economy and thereby simultaneously contributing towards the development and competitiveness of a country and based on 14 pillars: (1) Business Environment; (2) Safety and Security; (3) Health and Hygiene; (4) Human Resources and the Employment Market (5) IT level; (6) Priority of Travel and Tourism; (7) International Openness; (8) Price Competitiveness; (9) Environmental Sustainability; (10). Air Transport Infrastructures; (11) Road and Port Infrastructures; (12) Tourist Service Infrastructures; (13) Natural Resources and (14) Cultural Resources and Business Travel.

There are also other indicators that enable the measuring of competitiveness in regional terms, specifically: business firm density, population density (inhabitants per km2), variations in GDP, the immigration rate, company size (employment), bankruptcies (Cameron, Proudman, & Redding 2005; Fagerberg, 1994; Keller, 2005).

2.3. Natural Disasters and Tourism

2.3.1. Impacts and Consequences

Peace, security and protection are the essential conditions for the normal tourism development of a country, region or destination (Cavlek, 2002). However, Z. Breda and Costa (2006) consider that in recent decades, the tourism industry has been gravely harmed by the rising lack of security caused whether by crime, terrorism, food security, health problems and natural disasters. Furthermore, tourism is one of the economic sectors most sensitive to the climate and the effects of any such changes and alterations is a rising concern across the sector (Michailidou, Vlachokostas, & Moussiopoulos, 2016).

According to Mikulić, Sprčić, Holiček, and Prebežac (2018), the natural disasters that most impact on tourism are forest fires, floods and earthquakes; events that are not susceptible to accurate forecasting. Indeed, while scientists are able to forecast the probability of a disaster, they remain unable to forecast either the place or the time (Rittichainuwat, Nelson, & Rahmafitria, 2018). In turn, Faulkner and Vikulov (2001) and Faulkner (2001) maintain natural disasters may occur randomly and rapidly, without advance warning and generating a domino effect for local industry (Cioccioa & Michaelb, 2007).

This type of disaster may cause major human suffering, widespread physical damage and substantial economic losses that may well extend beyond the immediate location of the disaster and compromising the rest of the country whether temporarily or even permanently in terms of the general prevailing economic development of the country (Loayza, Olaberria, Rigolini, & Christiaensen, 2012) and consequently its level of competitiveness. Sanders, Laing, and Frost (2015) add that effectively dealing with the consequences of natural disasters is crucial to the sustainability of many tourist destinations, particularly those located in rural contexts where the impacts of these disasters are frequently more severe. Given this scenario, it is vital that rural communities understand the importance of accelerating their post-natural disaster recoveries, deploying whatever tools they have available to this end.

Correspondingly, the study of the long term impacts of disasters has become increasingly frequent (P. Hystad & P. Keller, 2008b) and there are now a range of case studies that approach the tourism industry during and immediately after a disaster and furthermore providing valuable information of assistance and relevance to planning for and bringing about tourism sector recovery (Calgaro, Dominey-Howes, & Lloyd, 2014; Cioccioa & Michaelb, 2007; Cradock-Henry, Fountain, & Buelow, 2018; Faulkner & Vikulov, 2001; Hystad & Keller, 2006; P. Hystad & P. Keller, 2008b; J. S. Kim & Park, 2016; Orchiston & Higham, 2016; Prayag, Fieger, & Rice, 2018; Reddy, 2005; Sanders et al., 2015; Smith & Henderson, 2008; Stephenson, Handmer, & Betts, 2013; Svirchev, Li, Yan, Ma, & He, 2011; Y. Tang, 2016; Thapa, Cahyanto, Holland, & Absher, 2013; H. T. Tsai, Tseng, Tzeng, Wu, & Day, 2012; Walters & Clulow, 2010; Wu, Chiu, & Chen, 2018).

According to Prideaux et al. (2003), despite the vulnerabilities of tourism to natural disasters, the tourism industry tends to be only ever poorly prepared for this type of disaster and generally assuming fatalist and passive positions (Cioccioa & Michaelb, 2007). Evidence for such an observation comes, for example, from the results of a study of the long term impacts of a major forest fire in Canada where only 28% of tourism companies had implemented any recovery initiatives up to even three years after this major event (P. W. Hystad & P. C. Keller, 2008). Furthermore, there are clear shortcomings in the awareness and implementation of the attitudes in relation to the planning and lack of responsibility for dealing with this type of disaster coupled with the lack of financial resources and knowledge, risk adversity, lack of organisational scale as well as only limited perceptions of cohe-

sion due to such companies being privately owned (Wang & Ritchie, 2012). However, despite the increasingly negative impacts that disasters have on tourism, there are researchers that do identify progress in the proactive planning ongoing within the industry (Burnett, 1998; Drabek, 1995; Faulkner, 2001; Heath, 2003; P. Hystad & P. Keller, 2008a; Kash & Darling, 1998; B. Ritchie, 2004). B. Ritchie (2004) recognises how companies are both prepared and in possession of competitive positions and advantageously positioned to react to these events and that the decisions taken prior to a crisis or disaster enable swifter and better organised responses, providing a clearer sense of direction with this constituting a highly important factor considering the challenges faced when decision making amidst the chaos of a disaster or other crisis.

The tourism sector has long since operated in turbulent environments, in which episodes of global market recessions may generate devastating consequences for economic success and with results such as widespread harm to priceless reputations, business viability and even threatening the survival of the industry (Preble, 1997; Wall, 2006). The potential for these consequences should thus be at least partially offset by incentives for industry to take into consideration crisis planning, thereby helping to make their organisations pro-active as regards attempts to control and deal with such events effectively and efficiently (Preble, 1997).

Furthermore, crisis strategic management actions may also alleviate the scope for negative consequences and to the extent of having become a vital ingredient to the development of any tourist destination (Mikulić et al., 2018) and consequently to the sustainability of the host region's competitiveness.

2.4. Empirical Evidence – Forest and Rural Fires

Faulkner (2001) identifies a lack of case studies approaching the impacts of disasters and the crises then faced by the local tourism industry, the responses that emerge from the sector in conjunction with the solutions of various government agencies and therefore appealing for further research able to identify the varied impacts and the response strategies for tourist destinations both during and after disasters. Indeed, in this sense, this researcher sought to contribute to the research agenda through exploring the tourism industry in terms of its preparations, the impacts and the responses to major forest fire disasters and the ways in which they impacted on the summer holiday tourist season in association with the economic impacts on the industry. The study was of great importance in Canada in keeping with the frequency and scale of forest fires in the country and the rising risk of potential disaster.

Cioccioa and Michaelb (2007) analyse the ways in which the 2003 forest fires in the northeast of Victoria (Australia), which devastated over 1.1 million hectares, destroying the means of existence of various tourism operators and leaving over a thousand small scale tourism companies without their source of revenue; examining the level of preparation in effect and the means of recovering from the event. They also verify the vulnerabilities and prevailing lack of preparations to deal with a danger of such magnitude. Furthermore, they demonstrate the resilience of the operators as well as their trust in their accumulated experience as the means of managing their recovery. They conclude by detailing the various lessons that might be applicable in similar circumstances.

P. Hystad and P. Keller (2008b) looked at the relationship between a disastrous forest fire and the local tourism industry that occurred in 2003 near Kelowna (British Columbia - Canada) through a monitoring study that analysed how the tourism industry developed long term after the disaster, through identifying the recovery strategies deployed, the remaining after effects and just what changed in tourism disaster management.

Other research projects have attempted to evaluate the structure of the economic losses caused by five major fires in southeast Australia and that served as case studies to examine the utility of the aforementioned structure. The data gathered on the impacts and the costs within the framework of this structure provide valuable information that serves a variety of applications, including measuring the efficiency of the repair, response and recovery programs implemented by the government, the effectiveness of such policies and the provision to companies of disaster related information applicable in their decision making processes. These authors point to the need to develop consistent values for estimating the environmental impacts and establishing a standardised format for research evaluating a series of indirect economic and social impacts (Stephenson et al., 2013).

Thapa et al. (2013), in turn, analyse the impacts of forest fires from a demand based perspective, including the perceptions of risk and reactionary behaviours in relation to forest fires taking place in Florida that led to the identification of three clusters: Aware Visitors, Cautious Visitors and Courageous Visitors. Furthermore, they formulate standardised segments in relation to the perceived levels of risk, the level of threat of forest fire based on various types of risk and modifications in tourism behaviours in specific situations of fire risk and just what behaviours might influence future visitors to destinations prone to fires.

From another perspective, Sanders et al. (2015) applied an exploratory study to the implementation of 87 events held in the wake of the 2009 Black Saturday fires in Victoria, Australia. Their results convey how the recovery of rural communities following natural disasters encapsulates eight main types of events: fund raising events, mourning events, community information sessions, community rebuilding events, re-openings, VIP visits, commemorations and thanksgiving events and with these events performing different roles in recovering from disasters. Such a portfolio of events serves for application to the (re)building of the tourist destination image, stimulating economic recovery and encouraging visitors to return within tourism contexts. In Portugal, some researchers have studied the consequences for tourism in the wake of the 2017 forest fires in the Centro Tourism Region of Portugal (Amaro & Barroco, 2018; Estevão, Costa, & Peraboa, 2018; Santos, Moreira, Ferreira, & Silveira, 2018) through applying exploratory and descriptive methodologies that focused their studies on the impacts of forest fires on tourism sector activities; the implications of the fires in Vale do Alva in Portugal, evaluating the competitiveness of these territories and the impact of forest fires on rural tourism, respectively.

3. The Centro Tourism Region

The Centro Region of Portugal covers an area of 23,273 km^2, which accounts for 26,12% of the national territory and is geographically characterised by the presence of the largest mountain range of Portugal, which rises to peak in Serra da Estrela (1991m). It also hosts the hydrographic basins of some of the most important Iberian and national river systems (Tejo, Douro, Mondego, Vouga, Zêzere, Dão, Lis, Côa, Ocreza, Ponsul)) that together left an indelible mark on the way these lands were occupied and evolved over the course of time (DRAP, 2018). This is a region featuring high peaks and rugged terrain, with twisting rivers running down deep valleys offset by the immensity of the surrounding green forests, including extensive forestry plantations, especially of pine and eucalyptus and, prior to 2017, covering over one-third of the national forested area. The botanical and fauna complexes are deemed of great environment, economic and tourist interest[1].

[1] http://www.drapc.min-agricultura.pt/base/regiao_centro.htm

The Centro Tourism Region of Portugal is the regional entity responsible for raising the value of tourism in the region, seeking to leverage the tourism resources present within the framework of the tourism sector strategies, guidelines and legislation defined by the government and the multi-annual plans of the central and the regional municipal authorities. This entity both manages and promotes the "brand" of the territory based on the slogan "1 day is good, 2 are wonderful, 3 are never too much" within the scope of conveying an understanding of the centrality, the diversity, the history and the nationality coupled with sensations of dynamism and contemporaneity (Machado, 2018). This also derives from how the region hosts a great diversity of attractions, displaying great contrasts ranging from the sea to mountain peaks, home to a greatly appreciated gastronomic tradition, wines with national and international reputations and a cultural heritage of great value. Furthermore, there are also many sites amply bestowed with their own histories, legends, customs and traditions.

4. Methodology

4.1. Describing the Data

To achieve the study objective and answer the research questions, the methodology adopted for the implementation of this current study incorporated secondary data analysis: area burned (Hectares), number of guests in accommodation establishments, number of nights spent in accommodation establishments, total revenues (€) of accommodation establishments, revenue per room (€) of accommodation establishments, unemployment, population density, ATM withdrawals by national account holders (€) and retail card payment purchases (€). The source of these data was the National Institute of Statistics (INE) and the SGIF - Forest Fire Management System from 2010 to 2018. For the methods used, a descriptive analysis and hypothesis testing for the Comparison of Averages was performed using the SPSS version 22.0 software.

In summary form, Table 1 sets out the technical file for the fieldwork undertaken:

Table 1 | Fieldwork Technical File

Geographic Area	NUTS II – Centro
Data	Area Burned (Hectares) Guests (No.) in accommodation establishments Nights spent (No.) in accommodation establishments Total revenues (€) of accommodation establishments Revenue per room (€) of accommodation establishments Unemployment Population density ATM withdrawals by national account holders (€) Retail card payment purchases (€)
Data Sources	SGIF – Forest Fire Management System INE – National Institute of Statistics
Period under Study	2010 to 2018
Statistical Analysis	Descriptive Analysis and Hypothesis Testing for the Comparison of Averages
Statistical Software	SPSS 22.0

4.2. Analysis and Discussion of the Results

4.2.1 Analysis of the Area Burned

As detailed in figure 1, the Centro Region has continually been devastated by forest and rural fires with peaks taking place in the years of 2010, 2012, 2013, 2015, 2016 and especially 2017.

As set out in figure 2, in the period between May and October 2017, in terms of the areas burned, and in descending order, the worst months were October, August, June, July, September and May. These months were fell within the scope of the final fortnight of Alfa Phase, all of the Bravo, Charlie and Delta Phases and part of Eco Phase as defined by the Civil Protection authority according to 2017 Operational Directive no. 2 – DECIF.

Observation of the figure below details how the districts reporting the largest areas lost to forest and rural fires were Castelo Branco and Coimbra accounting for 54% of the total area burned.

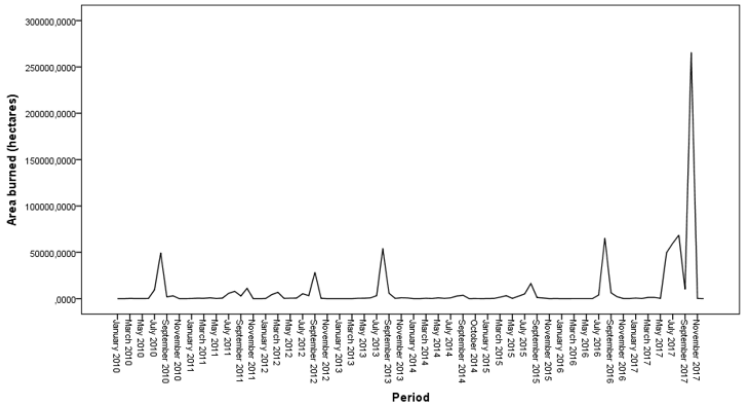


Figure 1 | Area burned between January 2010 and December 2017 in the Centro Region
Source: SGIF (2017)

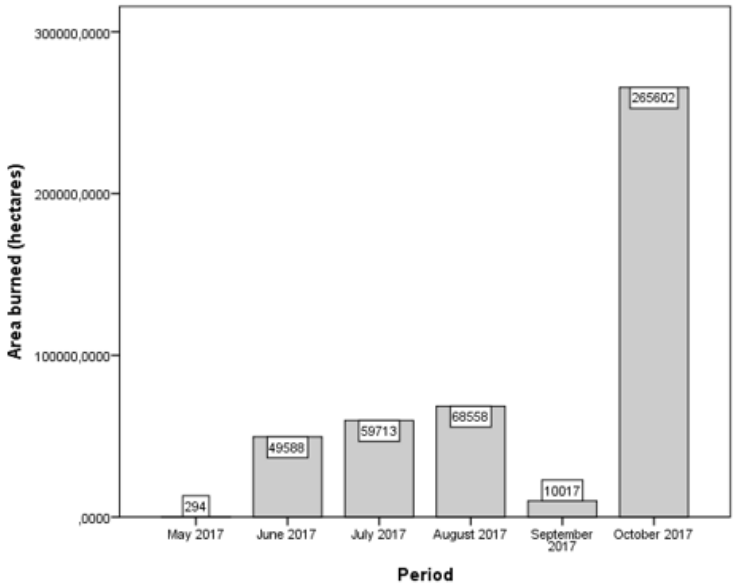
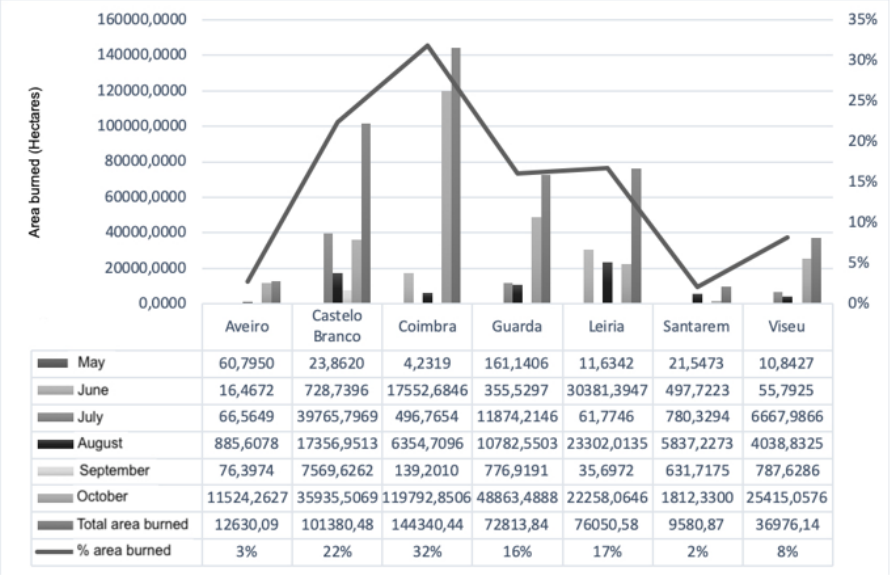


Figure 2 | Area Burned between May and October 2017
Source: SGIF (2017)



	Aveiro	Castelo Branco	Coimbra	Guarda	Leiria	Santarem	Viseu
May	60,7950	23,8620	4,2319	161,1406	11,6342	21,5473	10,8427
June	16,4672	728,7396	17552,6846	355,5297	30381,3947	497,7223	55,7925
July	66,5649	39765,7969	496,7654	11874,2146	61,7746	780,3294	6667,9866
August	885,6078	17356,9513	6354,7096	10782,5503	23302,0135	5837,2273	4038,8325
September	76,3974	7569,6262	139,2010	776,9191	35,6972	631,7175	787,6286
October	11524,2627	35935,5069	119792,8506	48863,4888	22258,0646	1812,3300	25415,0576
Total area burned	12630,09	101380,48	144340,44	72813,84	76050,58	9580,87	36976,14
% area burned	3%	22%	32%	16%	17%	2%	8%

Figure 3 | Area Burned by Month and by District
Source: SGIF

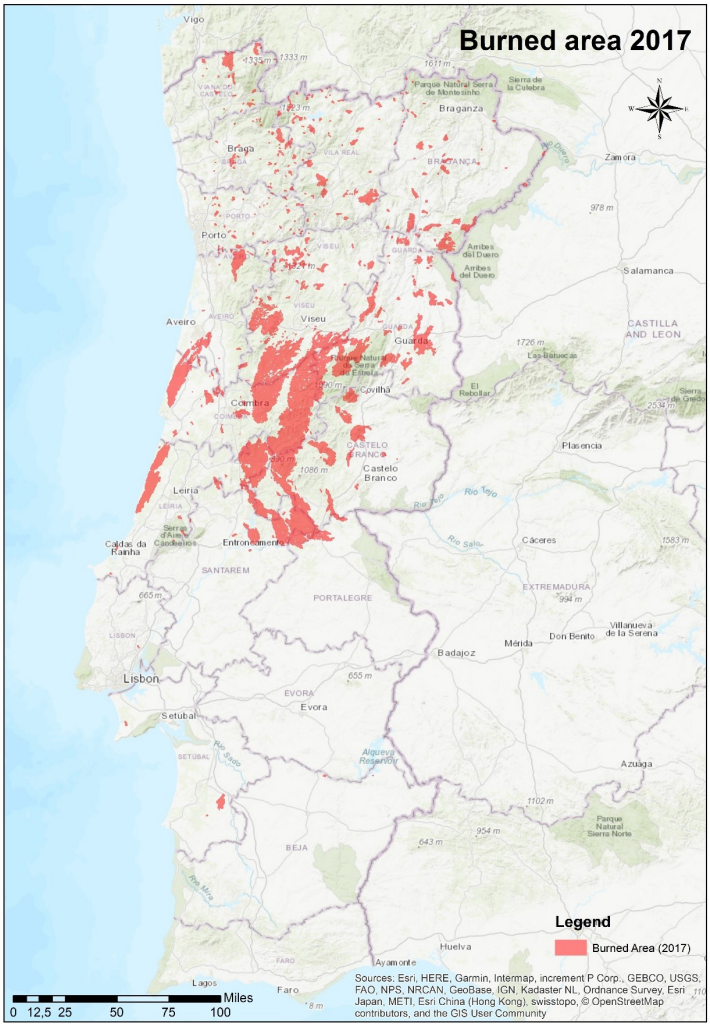
This highlights the month of October when the total area burned rose to a peak of 265,602 hectares, a total far in excess of any other period under study and representing 58.53% of the total burned area.

In order to provide a better geographic understanding of the area burned by district, Map 1 provides greater territorial precision as to which districts were worst hit by the fires of 2017.

With the exception of the cross-border Tejo Internacional and Serra da Malcata areas, we may identify how the worst afflicted districts by this natural disaster were in the Centro Interior region.

According to the provisional reports of the ICNF – the Institute for the Conservation of Nature and Forestry, in terms of the areas included in the national network of protected areas within the region, the Serra da Estrela Natural Park incurred the largest expanse of burned area thus far (19,337 hectares around 21.7% of the total park area) with the Natural Portas de Ródão Monument experiencing fire damage to almost 72% of its protected area. As regards those areas subject to the forestation regime, the most severely affected were: 100% of the Cambarinho Botanical Reserve (Vouzela), 99.4% of the Forest Perimeter of Castelo Novo (Serra da Gardunha), 93.8% of the Forest Perimeter of Louriçal do Campo (Serra da Gardunha), 89.6% of the National Forest of Pedrogão and 86% of the expanse of the National Forest of Leiria (Pinhal d'El Rei) with 9,476.3 hectares of burned area. There were also other focal points with natural and touristic interest of devastation caused by the forest fires, including Serra da Lousã, Penacova (Serra da Atalhada), Pampilhosa da Serra (Serra do Açor), Predogão Grande, Arganil (National Forest of Margaraça, classified as a Biogenetic Reserve by the Council of Europe), Castanheira de Pera, Penela, Figueiró dos Vinhos, Sertã, Quiaios-Mira and the Schist Villages of São João, Casal de São Simão, Mosteiro and Pedrógão Pequeno.

Map 1 | Territorial Area destroyed by the 2017 Forest and Rural Fires



Source: By the Authors

4.2.2. Descriptive Analysis of the Competitiveness Indicators

Based upon the figures available, we started out by analysing the number of nights spent and the number of guests at accommodation establishments in the Centro Region. Figure 4 displays a rising trend over the period under analysis (2010 to 2018), before peaking in August 2017 (837,408 nights spent and 403,095 guests).

The total revenues and the revenues at accommodation establishments see the aforementioned trend peak in August 2018 (€41,048,000 in total revenues and €30,965,000 in accommodation establishments) as set out in Figure 5.

Purchases made through Multibanco Payment Terminals and withdrawals from ATMs by national cardholders between January 2010 and October 2018 in the Centro Region (Fig.6) accompany the rising trend identified above and also peaking in 2018.

Figure 7 depicts the unemployment rate for the period under study with a downwards trend taking place from 2012 onwards.

The population density also undergoes a downward trend throughout the period under analysis (Fig.8).

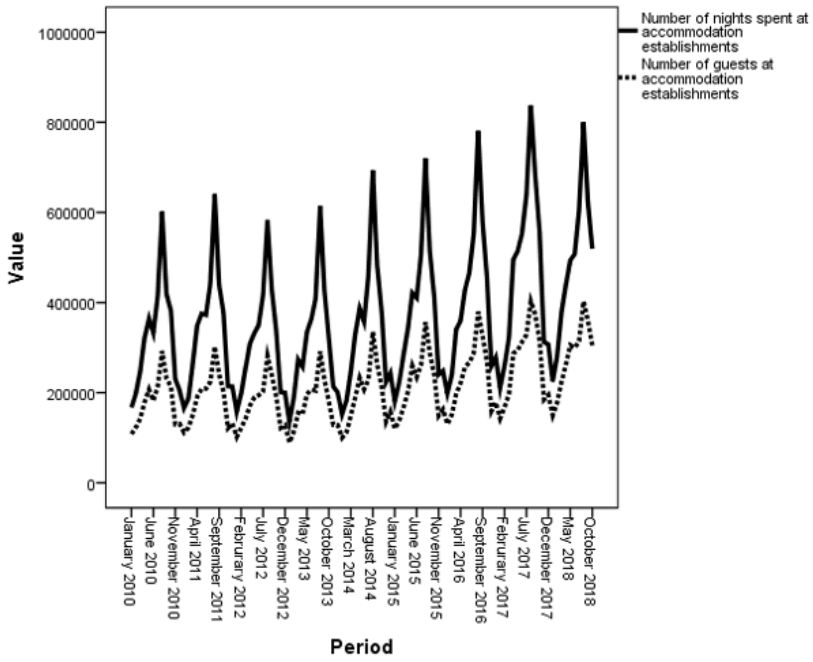


Figure 4 | Number of nights spent and number of guests at accommodation establishments in the Centro Region between January 2010 and October 2018
Source: INE

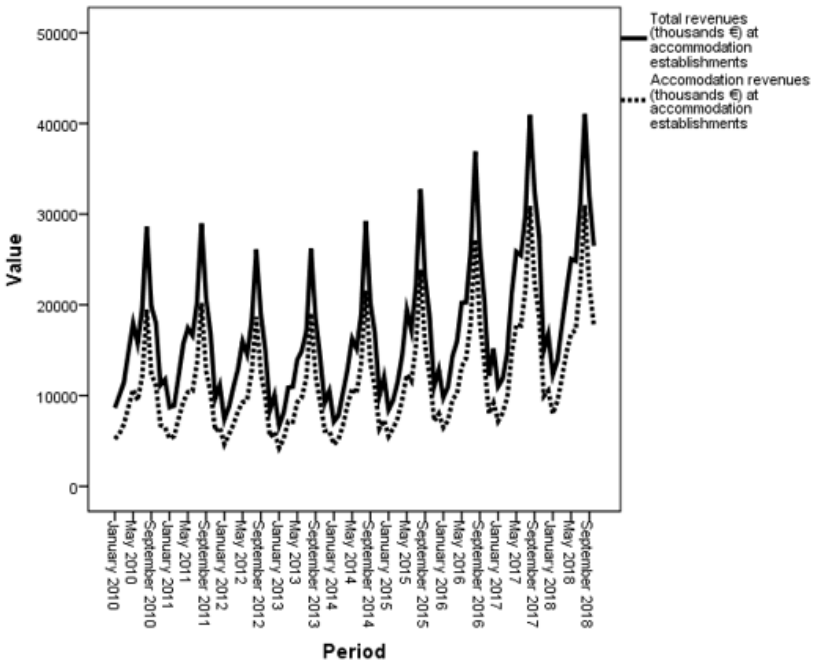


Figure 5 | Total revenues and accommodation revenues at accommodation establishments in the Centro Region between January 2010 and October 2018
Source: INE

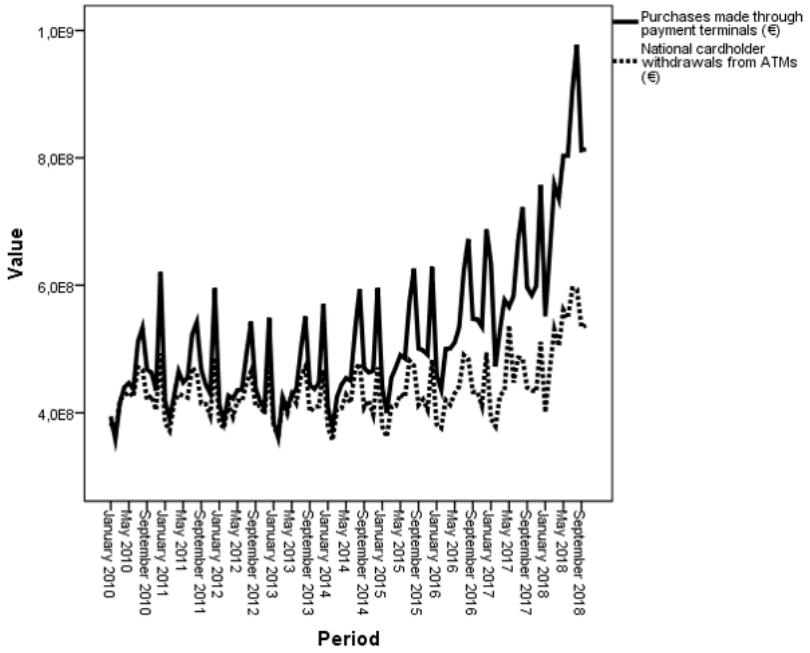


Figure 6 | Purchases made through payment terminals and national cardholder withdrawals from ATMs in the Centro Region between January 2010 and October 2018
Source: INE

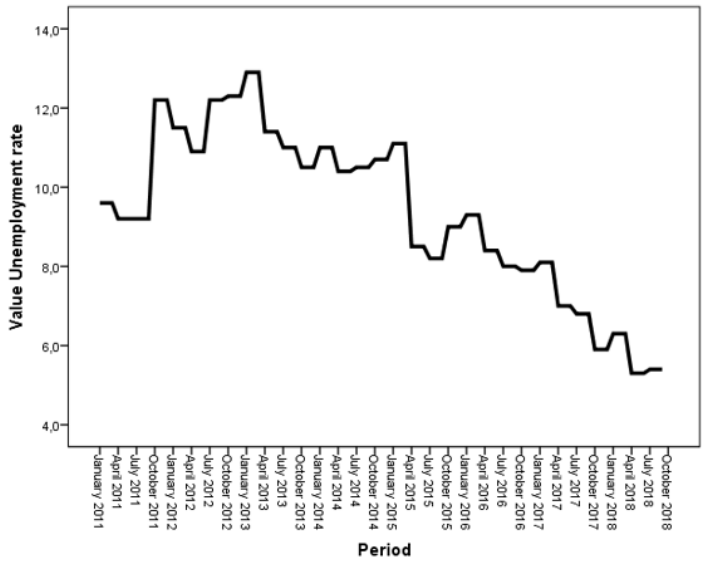


Figure 7 | Unemployment rate in the Centro Region between January 2010 and October 2018
Source: INE

According to Shapiro (2006), the population density reflects how a region or a place provides a better quality of life to its residents and hence this variable has long since negatively impacted on the competitiveness of this region due to the majority of the councils therein belonging to inland areas of the country with all of the consequences that this landlocked positioning brings to the regional development of this territory.

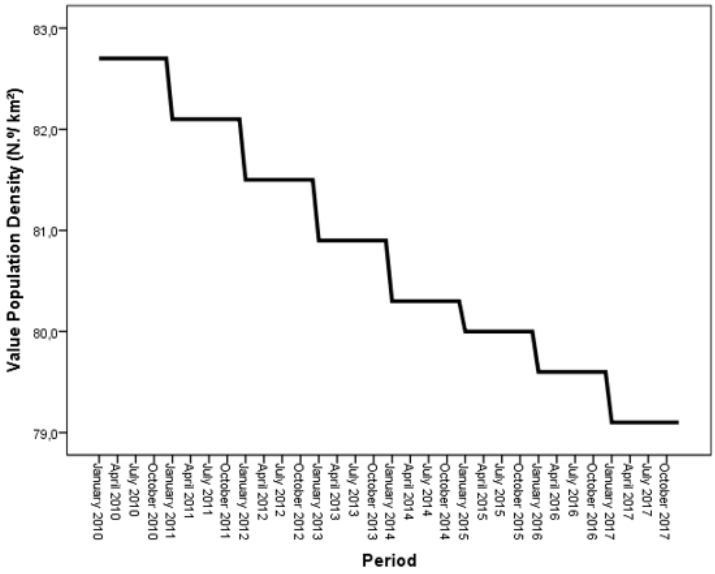


Figure 8 | Population Density in the Centro Region between January 2010 and October 2018
Source: INE

4.2.3. Comparison of the Competitiveness Indicators

For the following analysis, we took into account two different periods of the year:

- May to October (high season);
- November to April (low season).

We then proceeded with the comparison of the averages of the indicators under analysis for the high season and the low season months throughout the period prior to 2017 and for the period between 2017 and 2018.

As regards the number of nights and the number of guests at accommodation establishments, there were higher median values recorded for the 2017 and 2018 period and again both in the low season (Fig.9) and in the high season (Fig. 10), clearly reflecting a rise in tourism numbers in this period when compared with the previous period as duly confirmed by the Mann-Whitney Test ($p<0.001$).

Analysis of total revenues and at accommodation establishment revenues aligns with the conclusions set out above and correspondingly observing higher average values in the period between 2017 and 2018 and again in both the low season (Fig.11) and in the high season (Fig.12) as the Mann-Whitney Test then confirmed ($p<0.001$).

The amounts purchased through card payment terminal and ATM withdrawals by national cardholders also attain higher levels during the 2017 and 2018 period both in the low season (Fig.13) and in the high season (Fig.14). The Mann-Whitney Test furthermore confirmed the existence of statistically significant differences between payment terminal purchases ($p=0.023$) and national cardholder ATM withdrawals ($p<0.001$) in both the low season and in the high season ($p<0.001$).

The unemployment rate displays an inverse trend, registering a significant fall between the period prior to 2017 and the years of 2017 and 2018 for both of the seasons under analysis (Fig. 15 and 16) in keeping with the results of the Mann-Whitney Test ($p<0.001$).

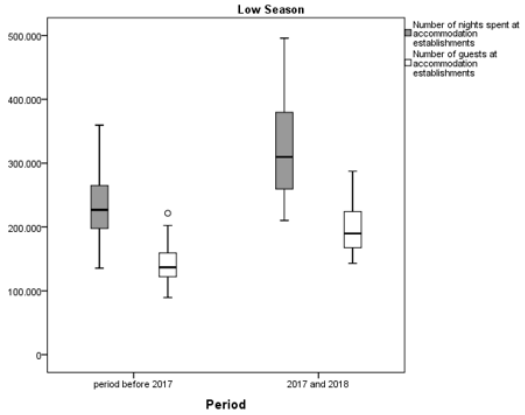


Figure 9 | Box-plots of the number of nights and the guests at accommodation establishments in the low season in the period before 2017 and for the period between 2017 and 2018 in the Centro Region
Source: INE

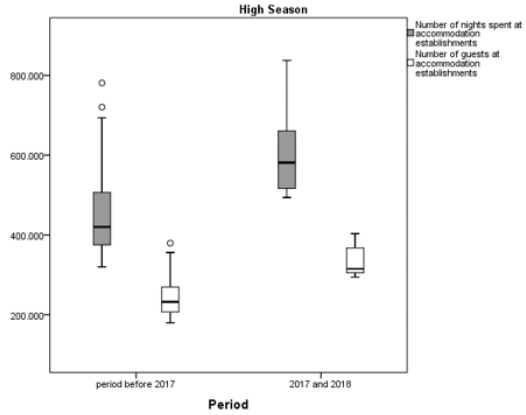


Figure 10 | Box-plots of the number of nights and the guests at accommodation establishments in the high season in the period before 2017 and for the period between 2017 and 2018 in the Centro Region
Source: INE

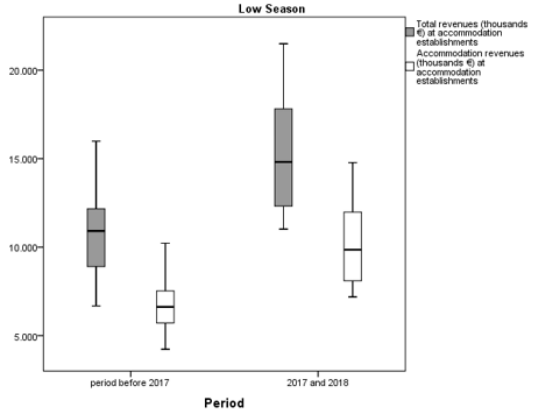


Figure 11 | Box-plots relative to total revenues at accommodation establishment revenues in the low season for the period before 2017 and for the period between 2017 and 2018 in the Centro Region
Source: INE

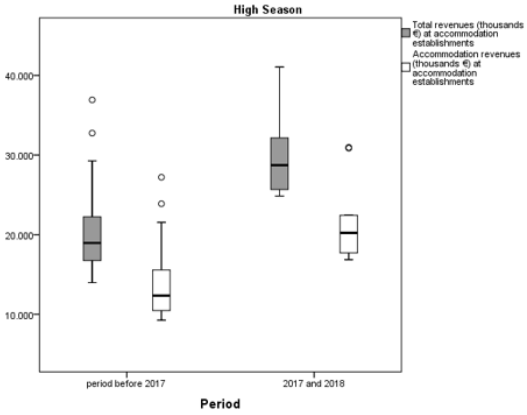


Figure 12 | Box-plots relative to total revenues at accommodation establishment revenues in the high season for the period before 2017 and for the period between 2017 and 2018 in the Centro Region
Source: INE

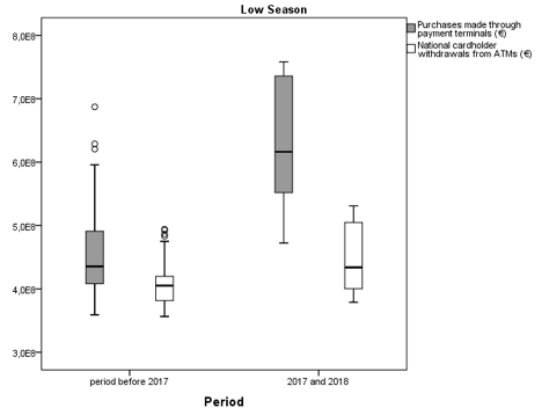


Figure 13 | Box-plots for card payment terminal and national cardholder ATM withdrawals in the low season for the period prior to 2017 and for the 2017 and 2018 period in the Centro Region
Source: INE

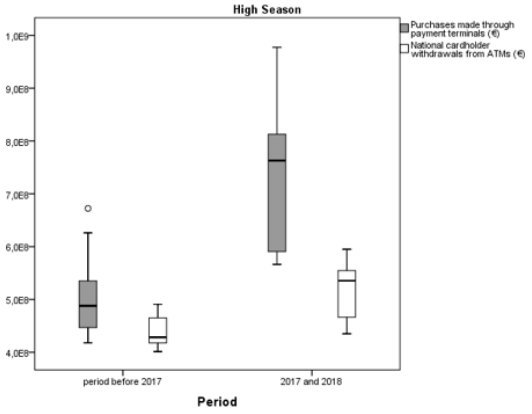


Figure 14 | Box-plots for card payment terminal and national cardholder ATM withdrawals in the high season for the period prior to 2017 and for the 2017 and 2018 period in the Centro Region
Source: INE

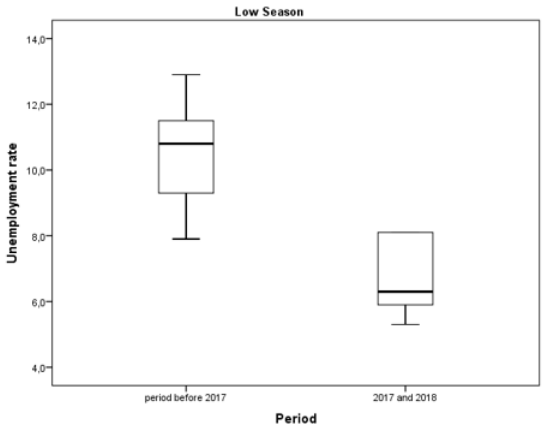


Figure 15 | Box-plots relative to the unemployment rate in the low season for the period prior to 2017 and for the 2017 and 2018 period in the Centro Region
Source: INE

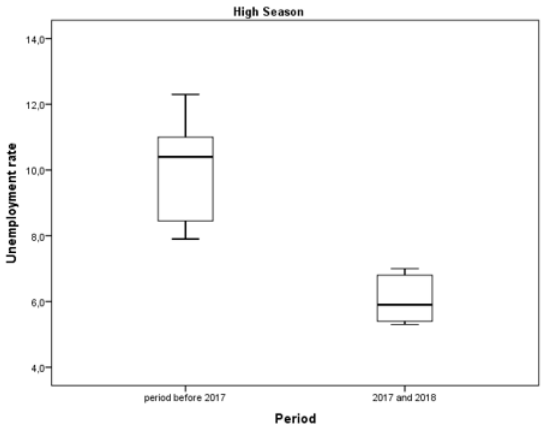


Figure 16 | Box-plots relative to the unemployment rate in high season for the period prior to 2017 and for the 2017 and 2018 period in the Centro Region
Source: INE

In summary, there is a clear rise in the competitiveness indicators under analysis when we compare the years of 2017 and 2018 with the preceding period.

Now focusing the analysis on the competitiveness indicators considered for the years of 2017 and 2018, we may observe that both the number of nights spent and the number of guests staying at accommodation establishments (Fig.17), as well as the total revenues and the accommodation revenues (Fig.18) attain very similar levels over the years of 2017 and 2018.

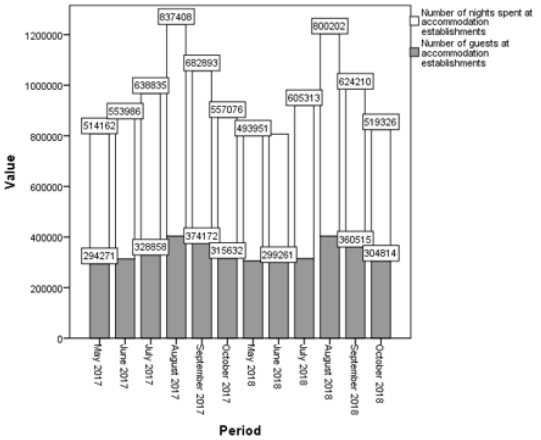


Figure 17 | Distribution of the number of nights and number of guests at accommodation establishments in the 2017 and 2018 high seasons in Centro Region
Source: INE

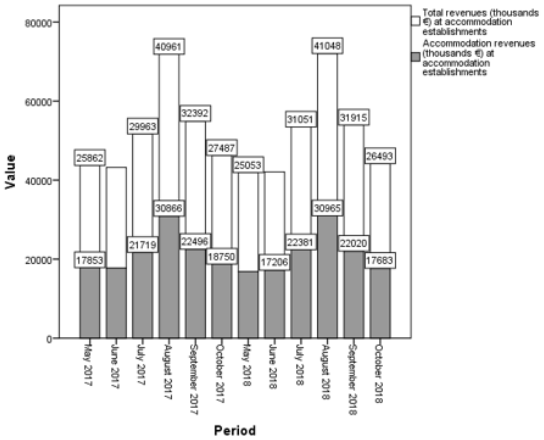


Figure 18 | Distribution of total revenues at accommodation establishment revenue in the 2017 and 2018 high seasons in Centro Region
Source: INE

Furthermore, a similar trend reflected in the purchases made through card payment terminals and ATM withdrawals by national cardholders (Fig. 19).

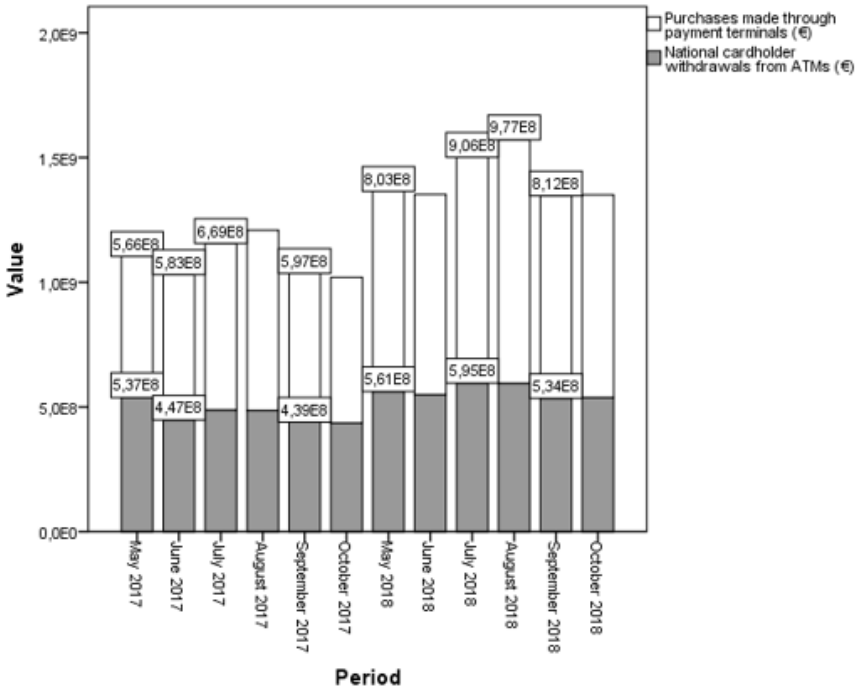


Figure 19 | Distribution of the amounts spent through card terminal payments and national cardholder ATM withdrawals for the high seasons in 2017 and 2018 in the Centro Region
Source: INE

In general terms, the 2017 forest fires would not seem to have negatively impacted on the competitiveness indicators in 2018. In fact, the latter year reports a pattern very similar to the preceding year that leads to the conclusion that there were no negative impacts registered.

5. Conclusions

Given the results returned, we are able to reach a varied range of conclusions. There is no doubt that the areas destroyed by forest and rural fires in 2017 covered an unprecedented and never before registered extent and triggering the catastrophic situation that tourism in the Centro Region confronted. However, according to the analysis undertaken, this does not seem to have driven any negative influence on tourist numbers in the region. Probably the analysis that we suggest will give different conclusions about this topic. In fact, 2017 and 2018 were the years with the greatest affluence of tourists and the highest level of revenues and income from tourism sector activities and running counter to every expectation.

Prior to advancing with analysis of the competitiveness of this region, we would first recall how Dwyer and Kim (2003) propose that tourism competitiveness combines various factors that may or may not be subject to observation and, that they are, on many occasions, not susceptible to easy measurement. Furthermore, in order to compete in the tourism sector, a destination not only needs to hold comparative advantages but also competitive advantages, thus, it is not only necessary to deploy a variety of tourism products and resources, to a greater or lesser extent, but these need to be efficiently managed over the medium and long term. Hence, based on the indicators applied for the competitive analysis of the region, every indicator, with the exception of population density, reflects how the 2017 forest fires do not seem to have compromised the region's competitiveness. However, there is

evidence that the comparative advantage suffered damage, such as the total extent of burned areas, jeopardising the natural heritage and the landscapes given the difficulties of viewing scorched earth landscapes where nature shall take decades to replace that which was destroyed by fire and hope becomes exhausted in the wake of each major blaze that cyclically devastates these same territories. We must also take into consideration that the implications of forest and rural fires extend beyond the devastation caused to the national forested heritage but also the sheer impact they cause to the landscape, degrading it and driving abrupt changes in the equilibrium existing in forested, natural, and consequently tourism attractive, environments that generate the healthy interactions that should prevail with the human presence. However, the differentiation built up by this tourist destination minimised the risk of loss of its comparative advantages.

Furthermore, this also highlights the resilience of the entities responsible for managing the tourist destination that implemented various marketing activities in the wake of the events, including positive and aggressive promotional campaigns and targeting influencers, strengthening investment so as to underpin the conditions necessary to the recovery, revitalisation and valuation of the tourism resources and assets affected by forest fires in the Centro Region and that were essential to securing the loyalty and restoring the confidence and trust of tourists returning to the region. Indeed, given the results obtained, we may even identify this as a case study of success in the strategic management of tourist destinations given the actions taken in the wake of the consecutive natural disasters that took place in June and October 2017.

The tourism agents that have their economic activity in the counties affected by the forest and rural fires were essential for the survival and recovering of the tourism services in the region. In relation to population density, this is a factor that has long since undermined the competitiveness of this region, reflecting the rural exodus and consequent abandoning of the territory and thereby still further raising the variables fostering the likelihood of further forest fires, for example the accumulation of combustible materials in rural and urban areas due to the lack of human capacity for their management. Tourism is an essential tool in regional economic growth and development and perceived as one of the "weapons" able to avoid desertification and the economic stagnation of regions, especially those of the interior (Opperman, 1993) whenever there are the prevailing conditions to support such activities.

One of the shortcomings of this research is concerned with the availability of data. In fact it would be of outmost importance to analyse not only data about central Portugal but instead on a municipality scale. However, this data is not available and thus this small scale insight is not possible. As future lines of research, we would propose studying the perceptions of residents following the forest fires of 2017 and undertaking a comparative study with Greece that in 2018 suffered a similar natural disaster and displaying broadly the same vulnerabilities as Portugal.

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