"Assessing resilience in tourism: the case of Greece"

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During the last decade a new concept has emerged in the regional science debate, the notion of regional resilience, defined as the ability of a region to prevent, prepare, respond and recover after a disturbance, in order that this disturbance does not stand as an obstacle to the region's development. Regional resilience is characterized by the capacity of a regional economy to i) withstand external pressures, ii) to respond positively to external changes and iii) to adjust and to learn. According to international literature, a region should exhibit certain characteristics in order to be considered as resilient, including resourcefulness, performance, redundancy, diversity, innovative learning, connectedness, robustness and rapidity.

The aim of this paper is to explore the notion of resilience in the tourism industry. Tourism, an important economic activity and fast growing industry

worldwide, is one of the main income sources for many countries, including Greece. In Greece, tourism represents over 17% of the country's GNP and 18,3% of total employment. During the years of recent economic crisis, the Greek tourism sector has been affected less than other economic activities, indicating its importance for the Greek economy. Nevertheless, significant variations in the resilience of tourism on economic crisis impact seem to have occurred among regions and therefore research regarding regional tourism resilience has grown in importance. This paper aims to investigate the extent to which Greek regions are resilient as far as tourism industry is concerned. More specifically, we evaluate the adaptability of regions, tourism destinations and actors to the socio-economic changes and the degree of resilience of each region during the economic crisis i.e. whether they can cope with it, overcome it and recover from it. Furthermore, we intend to investigate how the evaluation of present resilience can contribute to the improvement of resilience planning and management on a regional basis. The central thesis of this research is that regional variations in the tourism industry resilience call for regionally adjusted tourism planning and management policies. In order to achieve the aim of the research, we will examine the impact of economic crisis on regional hospitality industry employment, measured by the change in the number of jobs in hospitality business (hotels) within each region, and attempt to model employment resilience after the industry experiences an economic shock. Tourism industry is a critical source of regional economic activity, and therefore it is important to understand what happens to industry employment due to economic crisis and the mechanisms by which regional tourism industry resilience is achieved. In this way, we will investigate the impact of the socio-economic changes in regions and through the noted declinations we will estimate the extent to which these regions are tourism resilient in economic shocks.

Key Words: Greece, resilience, tourism, regions

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Introduction

Regional development has recently broadened from a focus on growth to increasingly encompass the relative resilience of regions in responding to an even more diverse array of external shocks and transitions, including financial crises, dangerous climate change, extreme weather events and so on (Pike et al., 2010). The basic question about why some regions manage to overcome short-term or long-term shocks and maintain a high quality of life for their residents while others fail, leads at an increasing interest in understanding what resilience actually means, how it functions and which factors influence it. In the present research we will focus our interest in examining the notion of resilience in the tourism industry, as tourism is an important economic activity and a fast growing industry worldwide, and constitutes one of the main income sources for many countries, including Greece. Tourism industry is a critical source of regional economic activity, and therefore it is important to understand what happens to employment in tourism sector due to economic crisis and the mechanisms by which resilience in the regional tourism industry is achieved.

This paper aims to investigate the extent to which Greek regions are resilient as far as tourism industry is concerned. At this point we have to clarify that we will examine the first two dimensions of regional resilience i.e. its ability to withstand external pressures and to respond positively to external changes, as the shock - economic crisis- hasn't finished. More specifically, we evaluate the adaptability of regions, tourism destinations and actors to the socio-economic changes and the degree of resilience of each region during the economic crisis i.e. whether they can cope with it, overcome it and recover from it. Furthermore, we intend to investigate how the evaluation of present resilience can contribute to the improvement of resilience planning and management on a regional basis.

In order to meet the objective of our research and to draw the appropriate conclusions regarding the issues raised above, initially we present the literature review that frames our study and then the research that was conducted. The literature review consists of the analysis of three parts: the relationship between regions and tourism, the regional resilience and the regional resilience in tourism. As far as the research is concerned, we present the used indicators which allow us to compare regions and their resilience.

Literature Review

Regions and Tourism

Regional development is a process which is divided into two levels: the external and the internal. As far as the external level is concerned, it includes the region's flows with the external environment i.e. the rows of products, services, capital and information (North 1955; Loukissas, 1982). On the other hand, the internal level concerns the internal differentiation which includes the workforce's specialization, the improvement of its capacities and generally the region's re-organization. As a consequence, tourism covers both of these levels as on one hand it creates flows for the region and its external environment and on the other hand it contributes at the shift of its social and economical structure. As a result tourism must be analyzed under both of these visuals in order to adequately present its real impact as a factor of social and economic change.

Tourism plays an important role for each region both economically and socially, since it is the connection between the region and the external world and economy. Although there isn't a commonly accepted view concerning the impact of this sector on regions' development we could summarize the perceptions regarding tourism to the following:

1. tourism brings social-economic changes in regions and encourages their development (Stylidis, 2014; Garcia et al., 2015),
2. tourism brings many people in small communities undermining their culture and their environment (Loukissas, 1982), and
3. tourism is a form of economic exploitation and neo-colonial domination (Matthews 1977; Loukissas, 1982).

Foster (1964) was the first who examined the different effects of tourism in the various communities, while Cohen (1979) stressed the importance of both benchmarking and the need to identify the economic, social and cultural conditions prevailed in a region which in combination with tourism's development contribute to regional development. So it is important for each region to be aware of these conditions as their existence will favor tourism's development.

In addition to these, the importance of tourism in regional level is booming because tourism contributes to the decline of unemployment. This is achieved, firstly, because it offers new jobs and also because it replaces the activities that lose their

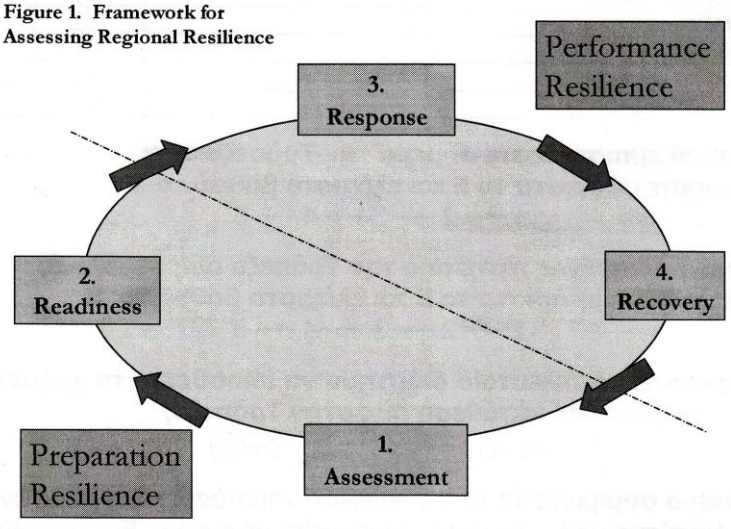
competitive advantage. This means that the primary sector is diminished and it is replaced by the sector of tourism.

Moreover, tourism has a multiplier effect in the regions. More specifically, besides creating new jobs, at the same time regions' revenues increase improving transport's services, constructions, trade, food industry etc. Therefore, there is a close relationship between tourism and other economic activities (Proenca και Soukiazis, 2008).

Regional Resilience

The concept of resilience is used to refer to systems and their ability to cope with external shocks and surprises. More specifically, resilience concerns the capacity of a system to absorb turmoil and reorganize while undergoing change, so as to still retain the same structure. Regarding regional resilience, it is defined as the ability of a region to prevent, prepare, respond and "recover" after a disturbance so as this disturbance not to stand as an obstacle to its development (Foster,2006; Hill et al, 2008) (Figure 1). According to the following figure, the process of resistance is divided into two parts: the preparation for durability and its application.

Figure 1. Framework for Assessing Regional Resilience



Source: Foster, 2006

According to Proag (2014) the concept of resilience takes two forms: the hard resilience and the soft resilience. When referring to hard resilience, we mean the direct strength of structures, when placed under pressure, so as to reduce their

probability of collapse, while soft resilience concerns the ability of systems to absorb and recover from the impact of shocks without fundamental changes in their structure.

Regional resistance is characterized by three dimensions:

- The ability of a regional economy to withstand external pressures (Foster, 2006; Hill et al., 2008; French et al., 2009; Hudson, 2010; Simmie and Martin, 2010; Davies, 2011).
- The ability of a region to respond positively to external changes (Hill et al., 2008; Ficenec, 2010; Davies, 2011).
- The capacity a region has to adjust in long terms and to learn (Pendall et al., 2010; Pike et al., 2010; Simmie and Martin, 2010; Davies, 2011).

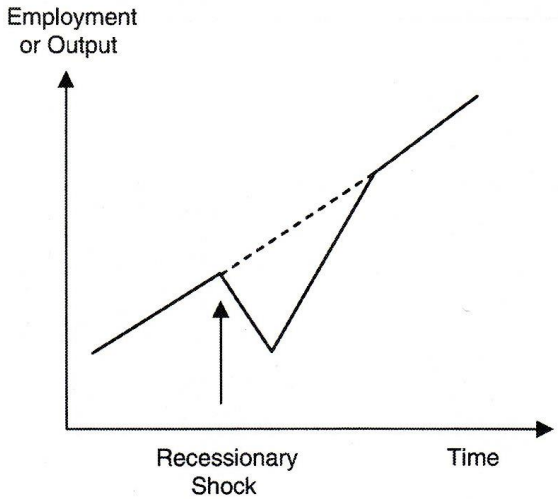
According to various researchers each region should exhibit certain characteristics in order to be considered resilient (Bruneau et al., 2003; Foster, 2006; Martin and Sunley, 2007; Bristow, 2010; Longstaff et al., 2010). These characteristics are resourcefulness, performance, redundancy, diversity, innovative learning, connectedness, robustness and rapidity.

According to Kallioras, "the resilience of a region is measured based on the evaluation of its ability to maintain a successful path of development (development path) after a disturbance, whether success is perceived in terms of traditional indicators such as growth (growth) or change of employment (employment change), or in terms of a synthetic index (composite indicator)" (Kallioras, 2011).

When referring to maintaining a successful development path this does not necessarily mean that a region should return to the same development path (Briguglio et al., 2006; Christopherson et al., 2010). As a consequence, there are several forms of resilience.

One such form is the engineering resilience (Figure 2). This form of resistance is focusing its attention on the elasticity or otherwise ability of a region to absorb the impact of a disturbance without undergoing significant structural changes (Walker et al., 2006; Pendall et al., 2010; Simmie and Martin, 2010). Its main idea is that a disturbance moves the economy of a region outside of the path followed, but the economy has the skills to self-corrected it back to its original state (equilibrium).

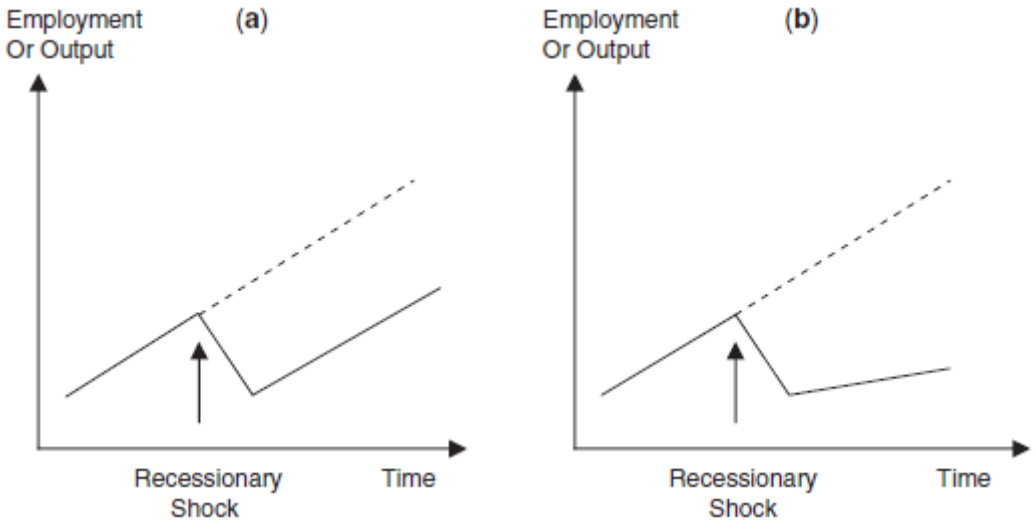
Figure 2 Engineering Resilience



Source: Martin, 2012

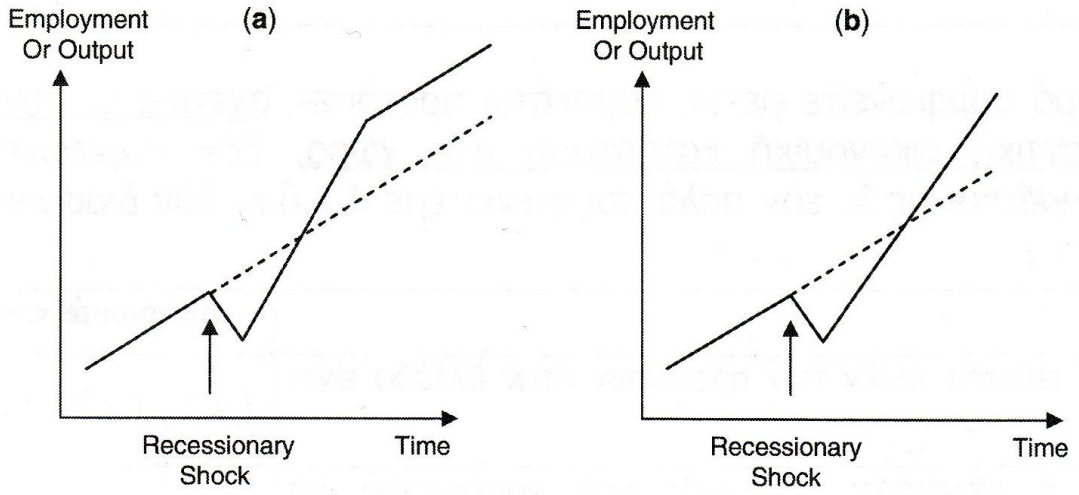
Another form of resilience is the ecological resilience. According to Hill et al. (2008) this type of resilience gives an opportunity for the region not to follow a path, which is not very efficient. On the contrary, it allows the region to choose that point that gives the optimal economic performance. However, the opposite can happen as well. This general idea in economics is defined as hysteresis. The shortfall can bring a complete change in an economy and move the path after a shock at a point different from what it was before the disturbance. Figures 3 and 4 show the effects of a crisis on a region's development pattern (Martin, 2012)

Figure 3: Negative effects of crisis on a region (Ecological Resilience)



Source: Martin, 2012

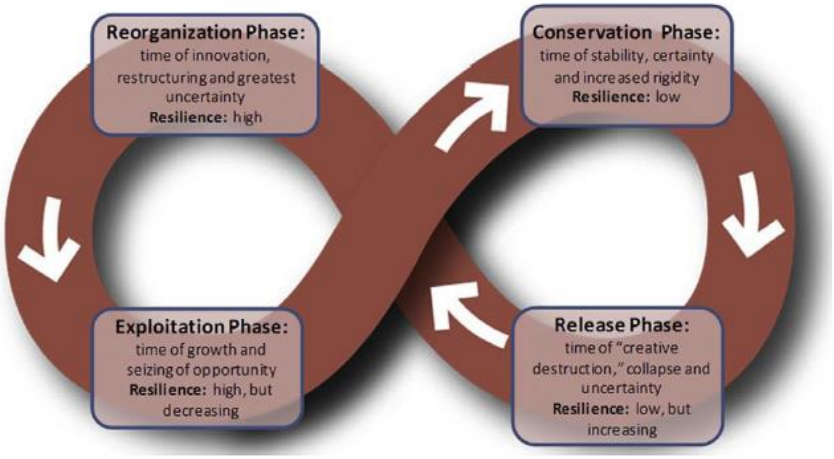
Figure 4: Positive effects of crisis on a region (Ecological Resilience)



Source: Martin, 2012

Finally, another form of resilience is the adaptive resilience (Carpenter et al., 2005). A region's probability to deal with various shocks depends largely on its ability to adapt to various conditions of the environment. This explanation is given in the framework of the theory of complex adaptation. Regional resilience in this context indicates the ability of a regional economy to adjust its structures when it suffers some disturbance so as to continue its growth and thus is presented as a dynamic process. For an economically successful region, the likelihood of such success being sustained over the long term will depend crucially on its ability to adapt to changing circumstances over time and to adjust to external shocks as and when these occur. This approach is the most dominant as regions are not looking to achieve a new equilibrium nor are they looking to simply "bounce back" to their pre-challenge state (Cowell, 2013). Instead, the concepts of adjustment and adaptation are generally regarded as more useful in analyzing regional resilience. Adaptive resilience is most often explained through the use of diagram 5 (Cowell, 2013) which depicts the four phases –conservation, release, reorganization, exploitation- of a region's adaptive cycle as is adjusts to internal and external changes (Figure 5). Each phase is related to the process of adaptive resilience, exhibited by the system's susceptibility to shocks and reflects the characteristics of a region and the level of resilience that it has during this time.

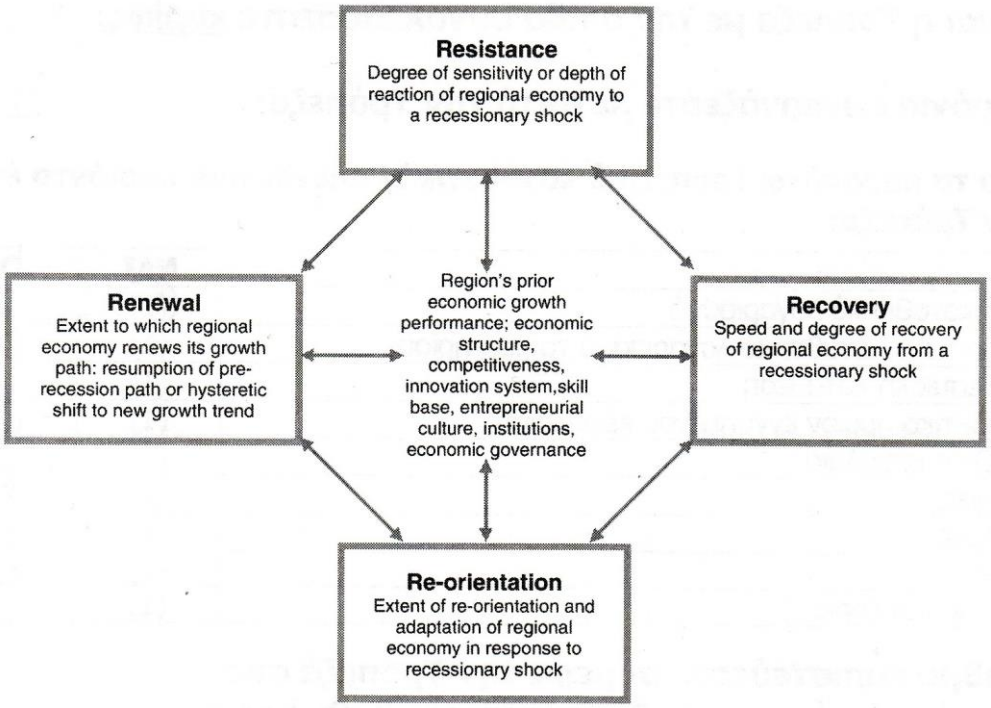
Figure 5: Four-phase cycle of system adaptation and change



Source: Cowell, 2013

According to Martin (2012) the most basic ways through which regions respond after each disorder are resistance, recovery, re-orientation and renewal or resumption (Figure 6). The following figure analyzes these responses.

Figure 6: A region's responses



Source: Martin, 2012

Summarizing, regions according to their degree of resilience after a disorder, are classified in the following three categories (Briguglio et al., 2006; Hill et al.,

2008). Initially, there are the economically resilient regions, i.e. regions that, after the shock suffered, they improve and grow more or at least return to their original condition - that they had before affected by the incident. Another category of regions are the shock-resistant ones. These are regions that, withstand such riots and did not "escape" from their course because of these. Finally, there are the non-resilient regions which can not meet these disorders because they can not return to their original state and are classified as non-persistent.

According to literature, there are several factors that affect a region's ability to be resilient. However, it is worth noticing that the importance of each factor is different in each region and changes over time (Christopherson et al., 2010; Hudson, 2010). This fact shows that it is not enough just to have these factors in one region to ensure regional resilience, but appropriate processes, structures and conditions should be applied as well (Polese and Shearmur, 2006; Chapple and Lester, 2007), which will contribute to the timely implementation of policies (Bristow, 2010; Christopherson et al., 2010; Simmie and Martin, 2010; Wolfe, 2010). According to Christopherson (2010) some of the factors that favor the development of resistance are:

- The existence of a regional system that supports innovation and learning (learning region).
- The existence of a modern production base which has modern infrastructure, experienced, skilled and innovative workforce.
- The existence of a supportive financial system to provide funds.
- The existence of competitiveness, which will contribute to the vitality of the region and will increase the capacity to adapt easily and quickly to new conditions through different business networks that will exist.
- A diversified economic base, i.e. the economy of each region does not rely exclusively on one industry. Also the region must be differentiated and in terms of type of business and sources of energy, food and general goods that are useful for its inhabitants.
- The existence of partnerships between universities and regional economies and between firms and local organizations.
- The existence of a supportive system of governance that encourages the existence of all these factors.

Resilience and Tourism

Tourism destinations, regions and actors around the world are confronted with various challenges such as climate change, demographic shifts and the economic crisis. Under these circumstances the question arises whether these regions are capable to overcome these surprises and to continue their development as far as their tourism is concerned i.e. where these regions are resilient or not.

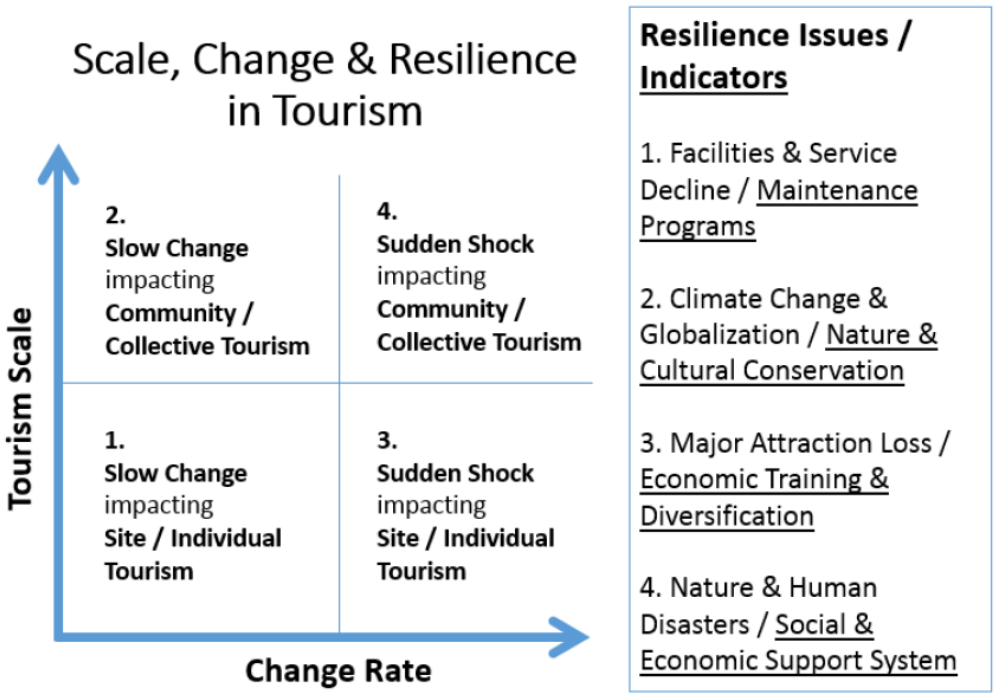
According to Nelson et al. (2007) in order to investigate the resilience of tourism systems we have to consider them as interrelated social, economic and ecological systems which not only have to face the change that exists, but also have to ensure the flexibility that is needed for the region in order to be developed. We stress the word interrelated as the collaboration between the tourism actors of a region and their activities undoubtedly will improve the performance both of these actors and of the whole destination because the tourist will understand that is part of a joint product development process (Beritelli et al., 2007; Pansiri, 2008; Saxena and Ilbery, 2008; Luthe and Wyss, 2014). In this context Folke et al. (2005) suggest that a resilient region has to dispose two characteristics:

1) Diversity in order to be prepared for the turmoil, and
2) Flexibility so as to respond to this one.

It is worth noting the fact that when we mention the notion of resilience in tourism, we are referred mainly at economic resilience and less at cultural, institutional or infrastructure resilience.

According to Lew (2014) there is a scale (Figure 7) which presents four types of tourism contexts and resilience depending on whether: 1) the shock is sudden or not (horizontal axis), and 2) it is about private entrepreneurs or shared public interests (vertical axis). This model is based on the idea that private entrepreneurs have a totally different focus in addressing resilience issues than public interests. Moreover, it assumes that people manage slow changes with different manner in comparison with sudden changes.

Figure 7: Scale, Change and Resilience in Tourism



Source: Lew, 2014

Observing the figure we note that each "box" presents a specific set of resilience issues for those operating within that context. Starting from the first box which illustrates slow change and individual entrepreneurs i.e. facilities and service decline, it appears that the last tries to modify their services in order to satisfy the changing needs of tourists and as a result to ensure their viability. On the other hand in such a case when we have a community and it has to face a slow change i.e. a shift in the ecosystem we note that it turns at natural and cultural conservation i.e. green certifications, corporate responsibility practices and so on. The third case happens when we have a sudden shock –a flood or an economic crisis- and an individual entrepreneur has to face it. In this case the problem is that the disturbance may lead at the loss of a tourist attraction or of a main tourist market due to political or economical developments. In such a case in order to overpass this change and the region to be regarded as resilient, the entrepreneur should have care to have diversification concerning its customers, its suppliers etc. The last "box" concerns the sudden shocks the community has to deal with. Economic crises, natural disasters constitute some examples of these changes. In this case the community needs a social and economic support system in order to respond at this disruption and recover quickly. As far as natural disasters are concerned, according to Winter (2011) the

tourism sector can support the preparation and response by supporting public education and awareness about similar disasters which hit tourist attractions.

The Case of Greece

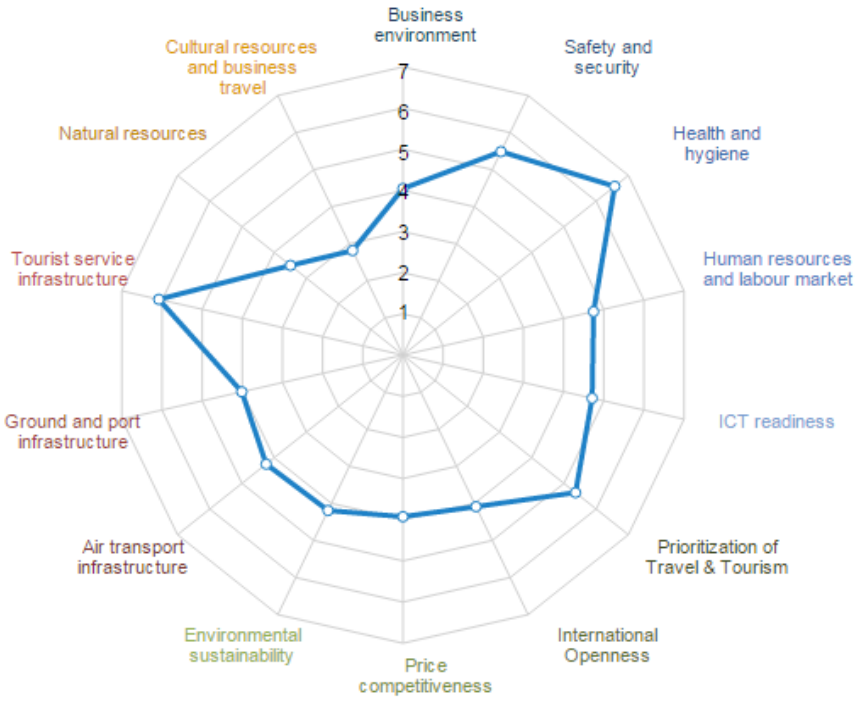
Tourism is one of the most important industries in Greece as it contributes significantly to the formation of the country's GDP. In addition to this, given the dispersal of tourist destinations around the country, tourism in Greece has a catalytic role in the dispersion of national income in the country's regions.

Nowadays, according to SETE (2015), tourism is the most growing sector of Greek economy because:

- It contributed directly to the creation of at least 9% of its GDP, while its direct and indirect contribution estimated at 20% to 25% confirming the common view that tourism is the "heavy industry" of the country,
- It constitutes the "engine" of the Greek economy as in 2014 it showed a growth of 11,3% or €1,8 billion (in 2013 its direct contribution to GDP was €15,2 billion and one year later was €17 billion). This is very important given that the total GDP was reduced about € 3,5 billion in nominal terms and was increased by 0,6% approximately in real terms due to the deflation,
- It offered 30% of employment's position in private sector, 31.000 positions at small hotels and rooms to rent and thousand positions at restauration's industry
- Each €1 from the tourism activity generates additional €1,20 to €1,65. As a result for each €1 of tourism revenue, Greece's GDP increases by €2,20 to €2,65. This means that tourism is an industry with great diffusion of benefits to the economy,
- Three island regions (Crete, South Aegean, Ionian Islands) dispose the highest per capita GDP in the country supporting the view that tourism leads to an improvement in the living standards of the regions in which is developed. This is confirmed by the fact that tourism industry contributes directly at the formation of at least 50% of the GDP of these regions,
- The revenues from travelling covered 75% of the trade deficit. This amount is almost equal with the revenues came from all other products exported by Greece apart from ships and fuel.

Internationally, according to the Travel and Tourism Competitiveness Report (2015) Greece holds the 31st place. More specifically, the country's performance is illustrated at the following chart, where 7 represents the optimum value a country can have and 1 the minimum.

Chart 1: A performance overview of Greece concerning tourism industry



Source: World Economic Forum, Travel and Tourism Competitiveness Report, 2015

Therefore, the significance and the dynamism of this industry for the Greek economy are obvious. Moreover, it is evident that Greek tourism is one of the few sectors of the national economy which is competitive at a global level. This dynamism is the starting point on which policies for tourism must be expressed, which tackle the major weakness of Greek tourism i.e. the seasonality (about 60% of arrivals and revenues incurred the 3rd quarter of the year and only the 6% and 3%, respectively, during the first one).

Methodology

This paper aims to investigate the extent to which Greek regions are resilient regarding tourism industry as far as the first two dimensions of regional resilience is concerned i.e. its ability to withstand external pressures and to respond positively to

external changes, as the shock -economic crisis- hasn't finished. More specifically, we intend to evaluate the adaptability of regions, tourism destinations and actors to the socio-economic changes and the degree of resilience of each region during the economic crisis. In order to examine whether the Greek regions were affected by the economic crisis and see which are resilient regarding tourism industry, certain indicators are used. These indicators concern the number of establishments that each region disposes, the number of tourists that arrive, the nights spent there, the number of employees that are occupied at tourism industry and the GDP per region. The use of those indicators is supported for the following reasons:

- The first three indicators, i.e, establishments, the number of arrival and nights spent, are confirmed by Faulkner (2000) who suggests that, the most common resilience perspective in tourism has been on the recovery of tourism industries and tourist arrival numbers.
- Employment is used in order to examine the employment resilience of Greek regions during economic crisis in tourism industry.
- GDP is used to obtain a complete view of the financial situation of each region. We also present the evolution of this indicator from 2005 to 2013 in order to examine the region's resilience for this indicator and also the existence of a relationship between GDP and tourism industry's revenues.

Data refer to years 2005, 2007, 2009, 2011 and 2013 (apart from the indicator of employment for which there are no available data for 2013) and are collected from Eurostat and Hellenic Statistical Authority for the case of educational data. We choose these periods of time so as to have data before the crisis, the first years of crisis and during the crisis.

In order to assess resilience we used the model proposed by Proag (2014). According to that model a region's resilience can be measured by the following index

$$\text{Re}\,silienceEfficiency = \frac{OutputUnderShock}{NormalOutput}$$ where (for our case) output under shock concern data of 2013 normal output concerns data of 2005.

When the value of this index is greater than 1, then the region is considered resilient. When the value of this index is smaller than 1, then the region is not resilient. The greater the value, the more resilient the region is considered.

Findings

This section includes the main findings of our research. Table 1 presents the evolution of the examined indicators in Greece and the percentage change of them from 2005 to 2013. We ascertain that the establishments, the arrivals and the nights have an increase from 2005 to 2013 revealing that Greece can be characterized as resilient concerning tourism industry. These indicators follow an increasing trend proving that Greece faces successfully the economic crisis and responses in such a way that allows not only stability, but also adaptation at the new conditions and as a result its development. On the other hand, the indicator of employment in tourism sector shows a slight decline indicating that resilience regarding employment in tourism industry is very low.

Table 1: Evolution of indicators in Greece

	Year					
Indicators	**2005**	**2007**	**2009**	**2011**	**2013**	**% Change 2005-2013**
Establishments	9.377	9.531	28.497	27.892	33.986	262,44%
Arrivals of tourists	13.412.596	16.037.592	20.900.268	21.083.002	21.818.726	62,67%
Nights spent	55.264.093	65.420.236	84.362.746	87.551.176	91.910.642	66,31%
Employment	280.175	298.118	289.036	269.014	-	-3,90%
GDP	199.153	232.831	237.431	207.752	182.438	-8,40%

Source: Eurostat

The first four charts represent the evolution of our indicators from 2005 to 2013 per region. More specifically figure 8 illustrates the evolution of the number of establishments during this period. As we can observe, despite of the economic crisis, the number of establishments at all regions has gradually increased and this increase became more intense from 2009 and later. The regions of South Aegean, Central Macedonia, Crete and Ionian Islands are in the first four positions. Although it is worth noticing the followings: Firstly, South Aegean is ranked by far first, as it disposes almost double accommodation compared with the second region. It is remarkable considering that Central Macedonia is a region three times larger than

South Aegean. Moreover, compared to Greece's total number of establishments (Table 1), we ascertain that South Aegean holds more than the quarter (26%) of total establishments. Secondly, Crete holds the third position, showing no change from 2009 to 2013! Thirdly, Ionian Islands are ranked fourth and in spite of showing an increase in the number of establishments from 2005 to 2013 revealing a resilient region, in reality from 2011 to 2013 the number was decreased almost 38%! This fact casts doubt on the upward trend of the Ionian Islands, while raises questions about its future development and its resilience.

Figure 8: Evolution of establishments

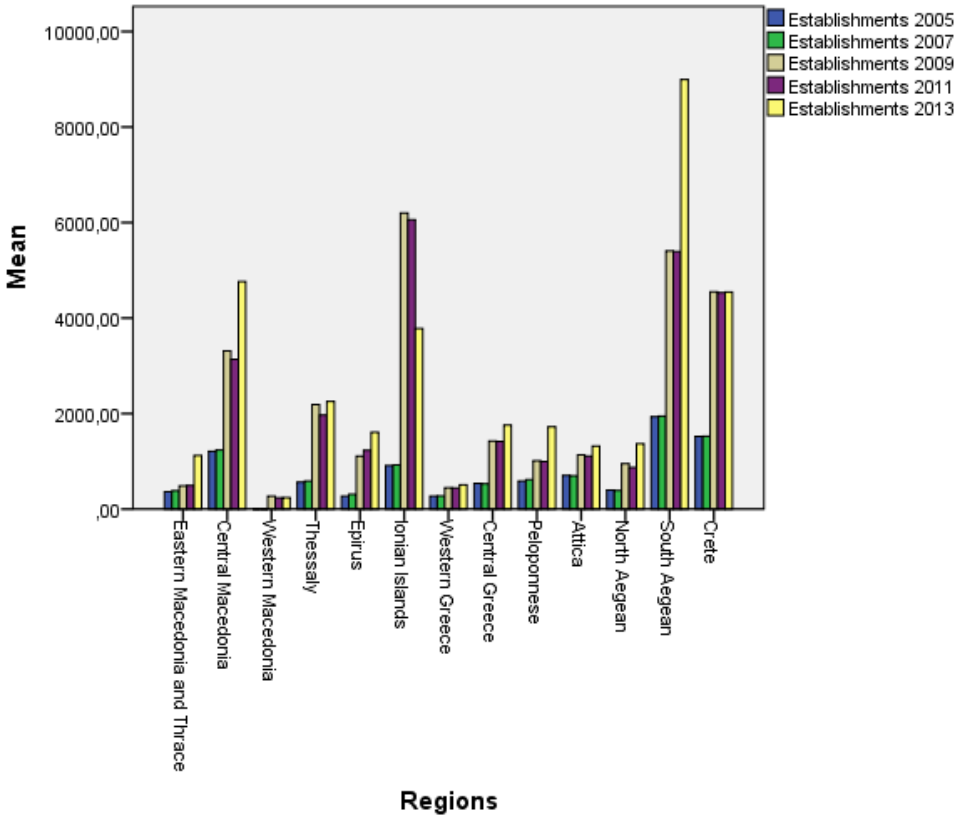


Figure 9 examines the evolution of arrivals per region during the period 2005-2013. Arrivals have increased during this period for all regions, with South Aegean, Crete, Central Macedonia and Ionian Islands showing the biggest increase. Although a more careful observation of the figure reveals a hysteresis at the majority of regions. More specifically, all regions apart from Eastern Macedonia and Thrace, Central Macedonia, South Aegean, North Aegean and Crete have a decline at arrivals from 2011 to 2013. The unstable political and financial environment of Greece influenced negatively this indicator, as it was a disincentive for many tourists to visit those regions. It is noticeable that South Aegean receives 20% of the total tourists coming

to Greece and in general almost 50% of them are gathered at 4 island regions: South Aegean, Crete, Ionian Islands and North Aegean.

Figure 9: Evolution of arrivals

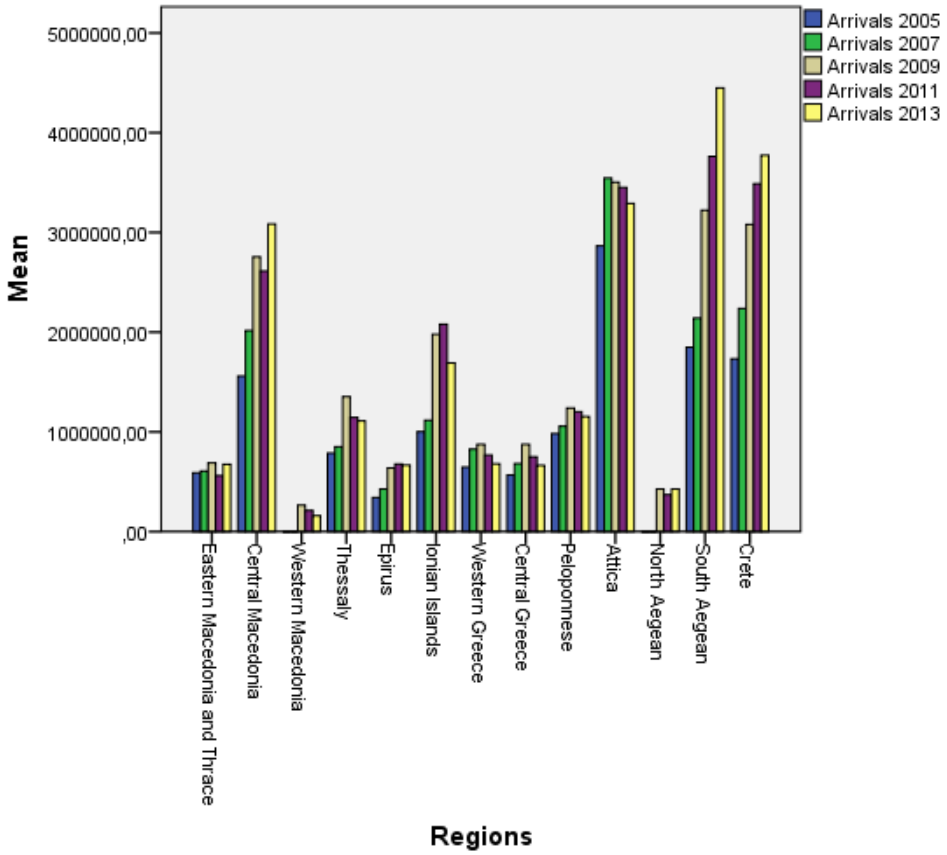


Figure 10 shows the evolution of nights spent per region during 2005-2013. The regions of South Aegean, Crete, Central Macedonia and Crete are once more ranked at the first four positions concerning this indicator. The number of nights that tourists spent at the establishments during their vacations has been increased from 2005 to 2013 at all regions. This is a positive feature, as we note a simultaneous increase both of arrivals and nights spent from a peaceful and financially strong period to a more complex period where economic crisis dominates. Although, as it happens at arrivals, the same "problem" arises here: while there is an increase from 2005-2013 at all regions, from 2011 to 2013 we observe a reduction at five regions: Western Macedonia, Ionian Islands, Western Greece, Central Greece and Attica. Moreover, it is worthy noticing that over half of nights (64%) are spent at island regions!

Figure 10: Evolution of nights spent

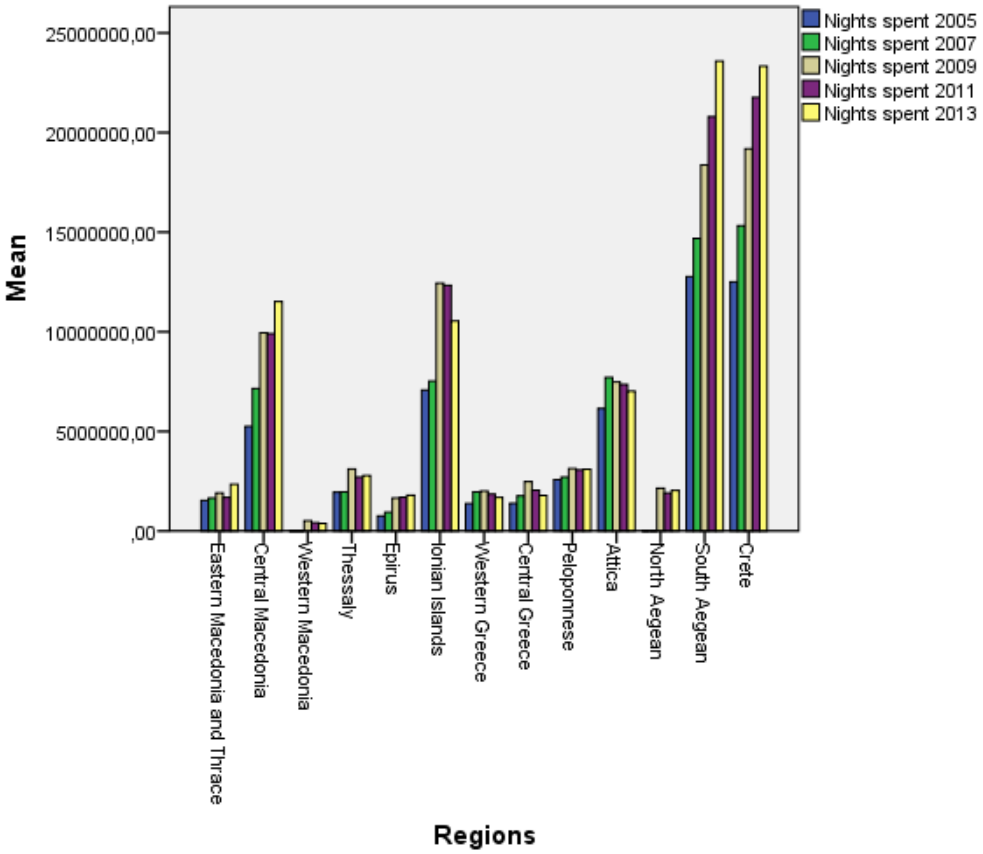
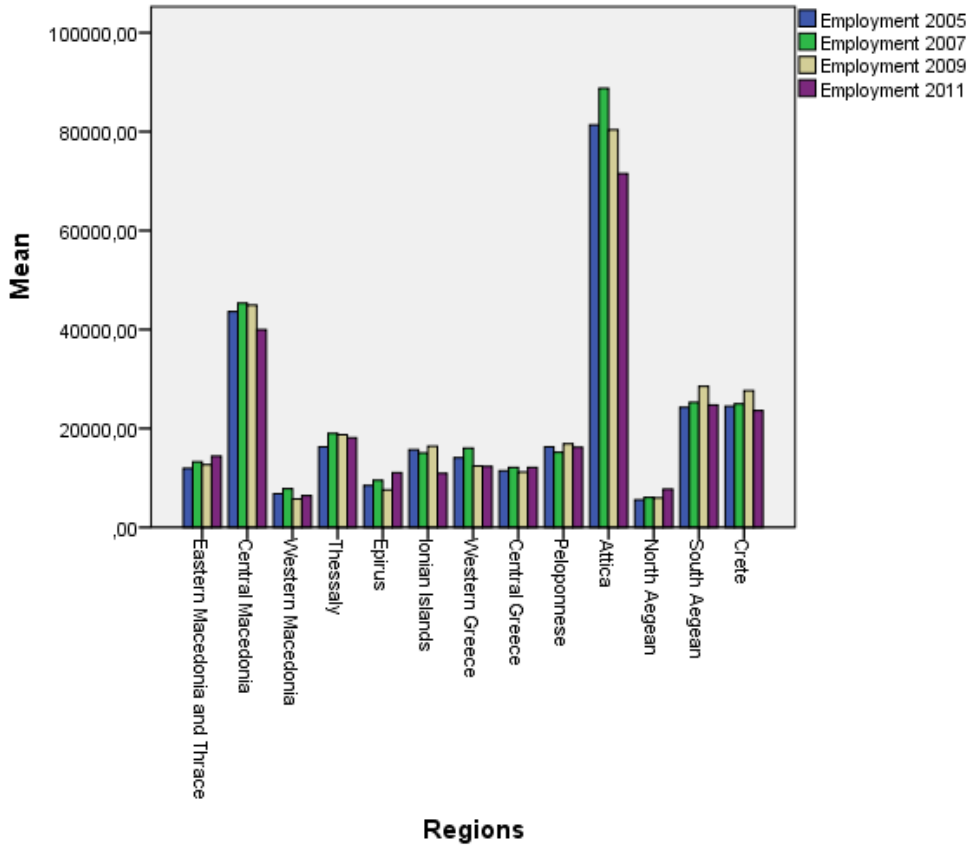


Figure 11 presents the evolution of employment in tourism industry from 2005 to 2011. As we can note, the number of people employed at the tourism industry – accommodation and food service- have been declined at seven regions. It is worth noting that despite the fact that the regions of South Aegean and Crete are considered as the dominants at tourism industry, the majority of employees is at the region of Attica. According to the report of the World Economic Forum (2015) for every 30 new tourists to a destination, one new job is created. Yet, the industry has difficulties in attracting top talent, both for technical and managerial positions. As a result, the public and private sector need to collaborate closely to update university and training programmes to ensure they keep up with market needs and technological advancements.

Figure 11: Evolution of employment in tourism industry



Based on the previous data we calculated the Resilience Efficiency Index. Results are presented in table 2. Regarding establishments, we note that apart from Western Macedonia, all other regions are considered resilient. Especially, Epirus, South Aegean and Ionian Islands have high rates of resilience. Concerning arrivals we also notice that Western Macedonia isn't resilient enough, while South Aegean, Crete and Central Macedonia have higher ranks. Regarding number of nights spent, Western Macedonia and North Aegean present low level of resilience, while Epirus, Central Macedonia, Crete and South Aegean are the most resilient regions. Regarding employment in tourism industry, seven regions have values close to 1 and North Aegean, Epirus and Eastern Macedonia and Thrace have the highest rates of resilience. Finally, concerning GDP, all regions have values below 1 indicating non resilient regions.

Table 2: Resilience efficiency in tourism industry per region

Regions	Establishments	Arrivals	Nights Spent	Employment	GDP
Eastern Macedonia and Thrace	3,10	1,15	1,52	**1,21**	0,94
Central Macedonia	3,94	**1,98**	**2,20**	0,92	0,90
Western Macedonia	0,88	0,60	0,74	0,94	0,84
Thessaly	3,99	1,41	1,43	1,11	0,91
Epirus	**5,92**	1,95	**2,39**	**1,30**	0,95
Ionian Islands	**4,14**	1,69	1,49	0,70	0,86
Western Greece	1,87	1,05	1,23	0,88	0,89
Central Greece	3,26	1,17	1,28	1,06	0,82
Peloponnese	2,94	1,17	1,21	0,99	0,95
Attica	1,87	1,15	1,14	0,88	0,93
North Aegean	3,43	1,00	0,95	**1,38**	0,97
South Aegean	**4,65**	**2,41**	**1,85**	1,02	0,90
Crete	2,99	**2,18**	**1,87**	0,96	0,92

Figure 12 presents the evolution of GDP per region during the period 2005-2013. This is an indicator of the economic evolution of each region. It is obvious that all regions follow a negative trend due to the impact of economic crisis. Although, there is a smaller decrease at island regions. This reveals the direct relationship between the GDP of islands and the tourism. The urban centers are mainly based on services and industries that, due to economic crisis, were downgraded. On the other hand tourism industry is the unique source of revenue for the islands. Given that, the tourism industry hasn’t been affected by the crisis in significant effect, as the GDP of island regions has shown a small change.

Figure 12: Evolution of GDP

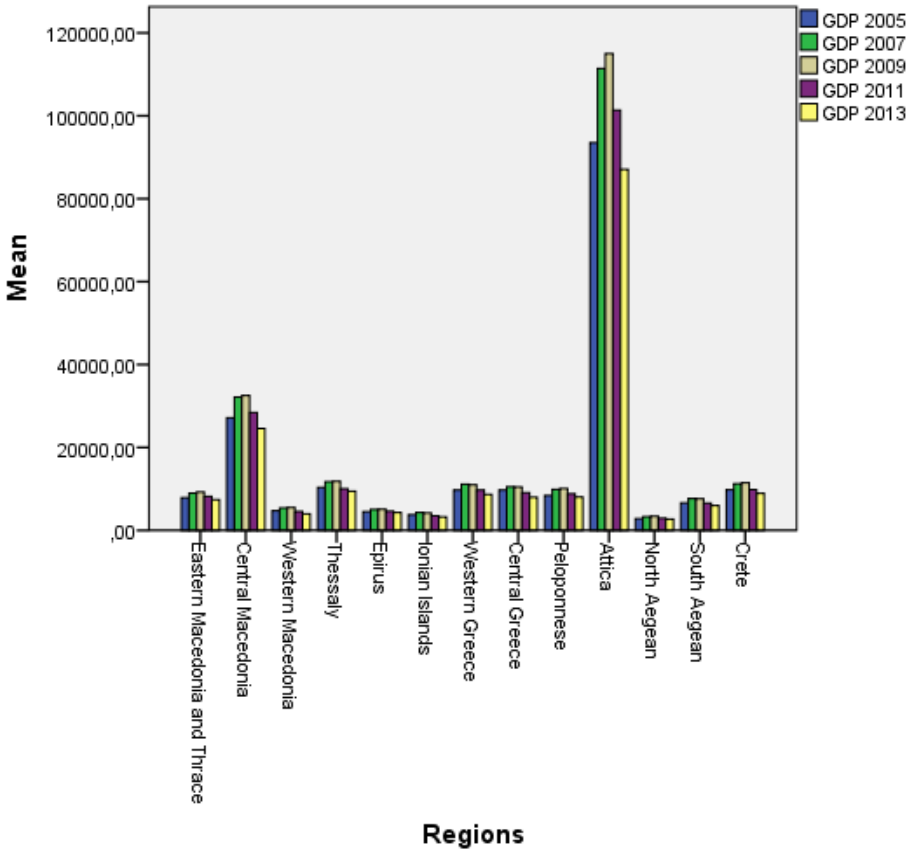


Table 3 and Table 4 examine the correlation between the percentage change of GDP and the percentage change of arrivals from 2005 to 2013 for mainland regions and island regions. We ascertain that there is positive correlation for both types of regions (0.215>0 and 0.856>0 respectivley). Regarding island regions, the relationship is strong, meaning that tourists' arrivals influence greatly the GDP of Greece i.e. they costitute a fundamental source of revenue for Greece. On the other hand, correlation for mainland regions is quite poor and this is probaply explained by the fact that these regions have other economic activities that rely their economy on.

Table 3: Correlation between Change of GDP and Change of Arrivals for mainland regions

		Percentage Change of GDP 2005-2013	Percentage Change of Arrivals 2005-2013
Percentage Change of GDP 2005-2013	Pearson Correlation	1	,215
	N	9	8
Percentage Change of Arrivals 2005-2013	Pearson Correlation	,215	1
	N	8	8

Table 4: Correlation between Change of GDP and Change of Arrivals for island regions

		Percentage Change of GDP 2005-2013	Percentage Change of Arrivals 2005-2013
Percentage Change of GDP 2005-2013	Pearson Correlation	1	,856
	N	4	3
Percentage Change of Arrivals 2005-2013	Pearson Correlation	,856	1
	N	3	3

The following figure shows the percentage change of GDP and employment in tourism sector for the years 2009 and 2011. As one can see, there is a positive employment change for the regions, Easter Macedonia and Thrace, Epirus, Central Greece and North Aegean. Regarding GDP change, all regions face a negative change, which is explained by the bad economic conditions that the country was facing due to the financial crisis.

Figure 13: Percentage Change of GDP and Employment 2009-2011

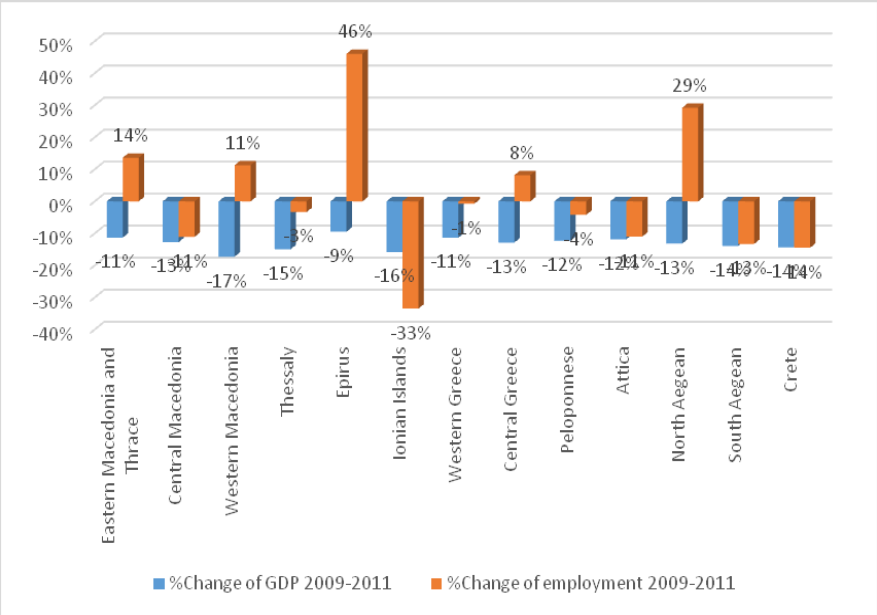
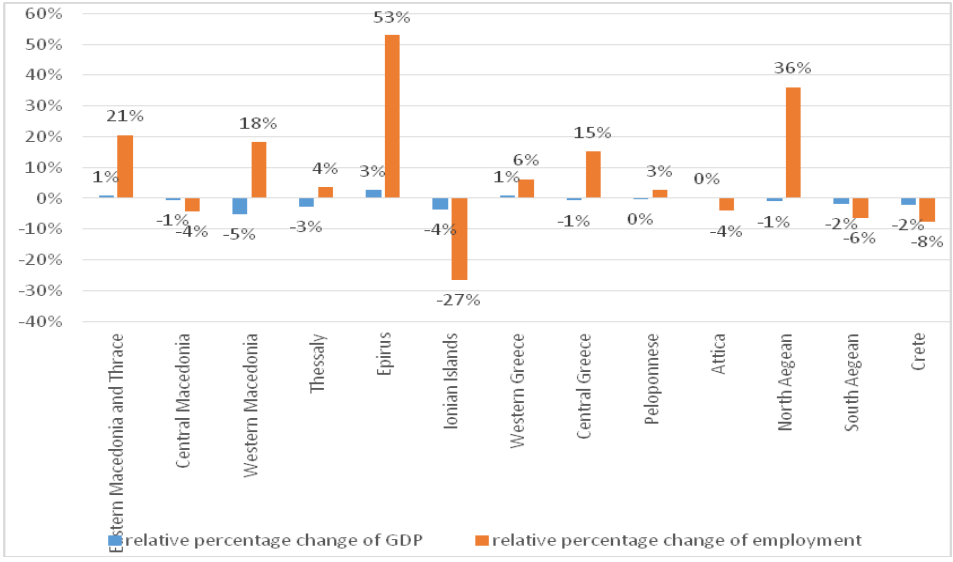


Figure 14 presents the relative percentage change of GDP and employment in tourism sectors between the years 2009-2011 as compared to the country's total percentage change. For example, -8% for the region of Crete, means that employment in the tourism sector was reduced by 8% more for that region as compared to the country's total. One can notice that employment was reduced more for the regions of Ionian Islands, South Aegean and Crete as compared to the country's total. Regarding GDP, it was reduced more for the regions of Western Macedonia, Ionian Islands, Central Greece, North Aegean, South Aegean and Crete as compared to the country's total change.

Figure 14: Relative Percentage Change of GDP and Employment 2009-2011



Conclusions

In this paper, we have sought to review and analyze the concept of regional resilience in tourism industry. Due to the environmental, economic, political etc changes, the notion of resilience is attracting increasing interest over the last years at many fields as it reveals the ability of a region to prevent, prepare, respond and recover after these changes, so as this disturbance not to stand obstacle to its development. As tourism is an integral part of contemporary communities and reflects the challenges of that communities face under the growing pressures of global economic and social change, we deemed necessary the assessing of regional resilience in tourism industry. The notion of resilience in tourism industry is very important as international tourist arrivals are correlated with economic fluctuations and this tends to impact specific countries or regions; if one country is hit by instability, others will receive more tourists.

As far as our case study is concerned, we examined the resilience –two of the three dimensions - of tourism industry in Greek regions. In general terms, we ascertained that the tourism industry continuous to grow quickly, and has proven resilient to shocks as confirms the survey of World Economic Forum (2015). More specifically, our initial goal was to assess the resilience in the tourism industry. We used five indicators: 1) the number of establishments that has each region, 2) the tourists' arrivals, 3) the nights spent at the region, 4) the number of employees in tourism industry, 5) the GDP, and we came to the following conclusions:

Firstly, as far as the first indicator is concerned, we notice that the Greek regions can be characterized as resilient because not only maintained their initial "path", but also they managed to be adapted to the new conditions multiplying their establishments and meeting the existing requirements. More specifically, Epirus, South Aegean and Ionian Islands are the most resilient as they quadrupled their capacity, despite the crisis. On the other hand Western Macedonia has a slight drop, signaling its low level of resilience.

Secondly, as far as tourists' arrivals are concerned, Greek regions seem to be resilient because not only arrivals weren't reduced due to the political and economic turbulences, but also doubled! In ranking South Aegean, Crete and Central Macedonia holds the first three positions, while Western Macedonia wasn't adapted to the changes and as a consequence its resilience efficiency is below one.

As far as the nights spent at regions during vacations is concerned, we conclude that this indicator hasn't changed at the majority of the regions (all apart from North Aegean and Western Macedonia) between 2005 and 2013 and as a result it proves that Greek regions are resilient. The regions of Epirus, Central Macedonia, Crete and South Aegean had the highest levels of resilience.

Moreover, concerning the fourth indicator i.e. the number of people worked at tourism industry, we ascertained that there is an intermediate state because almost half of the regions present resilience efficiency below one! On the other hand North Aegean, Epirus and Eastern Macedonia showed an upward trend. As a result, as far as the employment resilience is concerned, Greek regions cannot be characterized as resilient because we observed divergence between 2005 and 2011. Although, World Economic Forum (2015) supports that for every 30 new tourists to a destination, one new job is created, in Greece happens just the opposite. This is because the industry still has difficulties in attracting top talent, both for technical and managerial positions. The public and private sector need to collaborate closely to update university and training programmes to ensure they keep up with market needs and technological advancements.

Finally, we examined the GDP so as to obtain a complete view of the financial situation of each region and to examine the region's resilience for this indicator and also the existence of a relationship between GDP and tourism industry's revenues. We ascertained that all regions aren't resilient concerning this indicator. However, there is a slight differentiation between island and mainland regions: the former show a lower rate of change as far as GDP is concerned compared with mainland regions. This happens because islands' GDP is most affected by the tourism industry, rather than from other industries which have been negatively affected. Consequently, the resilience of tourism industry favors these regions further.

Conclusively, the tourism industry in Greece proved resilient enough, despite the challenges faced. In order to continue its development and to face the challenges successfully, it must be adapted to the new conditions approaching new travelers, understanding and catering its product offerings to their needs, improving its infrastructure and creating communication channels between the public and the private sector.

Suggestions of further research could include the use of relevant indicators in a model which will be able to measure tourism industry's resilience.

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