

Regional dimension of employment in the tourism sector: the case of Greece

JEL Codes: J21, Z32, R11

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Abstract

Tourism is an activity with social, cultural and economic dimensions. It involves people moving between places, beyond their permanent place of residence. It is a dynamic sector which has beneficial effects on enterprises and regions as well. The current financial crises seems to have little effect on the development of tourism. Greece has been a major tourist destination and attraction in Europe and has attracted 26.5 million visitors in 2015 making Greece one of the most visited countries in Europe and the world. Although the contribution of tourism to the country's GDP has been significant over the past years, tourism development among Greece's regions has many differences which lead to unbalanced tourism development among them.

The purpose of this paper is to capture the regional dimension of employment in the tourism sector of Greece. More specifically, quantitative methods are used to evaluate any trends in tourism employment between island and mainland regions, the effect on the regions'

development as measured by the GDP change and the effect of financial crisis on these trends.

The methodological framework used in this analysis includes quantitative methods in order to identify existing patterns of tourism employment among island and mainland regions and the effect of those patterns on the regions' development. More specifically, data refer to employment and Gross Value Added, tourist density indices, occupancy indices for the 13 Greek regions, for the period 2000-2013. For the purpose of this analysis, statistical measures of dispersion and concentration are used, such as, the Herfindahl-Hirschman Index, the Krugman Dissimilation Index and the coefficient of absolute structural changes as well as specific tourist indices, such as tourist density indices and occupancy indices. Finally, the findings of this analysis are compared to the findings of a similar research that was conducted before the financial crisis.

According to the analysis there seems to be a rather unbalanced tourism development among the Greek regions leading to a diversity in employment. More particularly, island regions show a high concentration of tourism activities, causing a spatial centralization of tourism development and a consequent uneven employment rate. Of course, due to the seasonality of tourism, these employment rates should be considered in caution.

Keywords

Tourism employment, development, GDP, regional inequalities, Greece

1. THEORETICAL FRAMEWORK

Tourism is an activity with social, cultural and economic dimensions. It involves people moving between places, beyond their permanent place of residence. Tourism is a dynamic sector which has beneficial effects on enterprises and regions as well. It is well known that tourism is one of the most important elements for a country's growth and development (Brida & Risso, 2009; Tang & Tan, 2013).

There have been many studies that highlighted the crucial role of tourism on national and regional development, by identifying the benefits to the population and the economy as well (Andereck & Vogt, 2000; Andraz et. al. 2015; Hall & Page, 2010; McGehee & Andereck, 2004; Katircioblou, 2009; Yang & Wong, 2012). Moreover, many researchers have tried to identify whether tourism reduces regional inequalities leading to a more balanced regional development. According to Andraz et al (2015) although all regions benefit from tourism, those benefits are not equally distributed among regions.

Due to the important role of tourism in their development, many countries have tried to create a tourism image that could be for their benefit, meaning attracting visitors (Botti et al., 2009; Dwyer et al, 2004; Gomezelj & Mihalic, 2008; Ritchie & Crouch, 2005). On the other hand, researches such as Webster et al (2014) have pointed that there is no direct positive relationship between a region's competitiveness and tourism's contribution to economic growth.

Regarding the effects of tourism on development, those can be economic, e.g. increased economic activity, economic development of the regions, social, e.g. increase in

employment, improvement of the quality of life, and environmental, e.g conservation of natural environment (e.g. Besculides, Lee, & McCormick, 2002; Bestard & Nadal, 2007).

In addition, tourism's affects are not limited only to the travel and tourism industry. On the contrary, tourism influences other economic sectors and services, such as retail, transport and constructions.

Unfortunately, the ongoing economic crisis has affected the tourist industry, as all others, attracting much attention from researchers (Papatheodorou, Rosello, and Honggen (2010), Sheldon and Dwyer (2010) , especially since this affect has appeared in an uneven way among regions and countries · short distance destinations seem to have been affected the least (Smeral, 2010).

Recent data reveal that that tourism is one of the industries that, although affected, has been the most resilient one. According to World Travel and Tourism Council (WTTC Report, 2015), the contribution of Travel & Tourism to total employment was over 3.8% in 2005. In 2014 this contribution reached 3.36% of total employment, generating about 105,408,000 jobs. The forecast for 2015 was that it would be a grow by 2.0% and by 2025, Travel & Tourism will account for 130,694,000 jobs directly, an increase of 2.0% pa over the next ten years. According to EU statistics, tourism is the largest service industry in the European Union. It accounts for more than 4% of the Community's GDP and employees about 4% of the total labour force (this is only for hotels and travel agencies). It is a labour-intensive and a fast growing sector which is not affected by the financial crisis, at least not as much as other sectors and economic activities. Of course the contribution of tourism is expanded to other activities as well. A study of International Labor Organization and World Tourism Organization reports that one job in tourism generates 1.5 jobs elsewhere (UNWTO and ILO, 2014).

The EU was, according to the United Nations World Tourism Organisation (UNWTO), a major tourist destination and five of its Member States where among the world's top 10 destinations in 2014. In 2015, the countries of EU where the most frequently visited ones, receiving more the half (51.4 %) of all international tourist arrivals, which accounts for 609 million persons. Greece on the other hand has been a major tourist destination and attraction in Europe and has attracted 26.5 million visitors in 2015 making Greece one of the most visited countries in Europe and the world.

The financial and economic crisis of the recent years has affected every aspect of the economy and the society. According to EU date, the result of the crisis was among others the increase in unemployment, the reduction of income, public and private cut offs and the general feeling of uncertainty. Employment is an indicator of a country's or region's development. It is of great importance and has always been on the core of research. Unfortunately, total employment has fallen during these last years and specific categories of employees , such as young employees, low-skilled ones and self-employed have been the ones that have been influenced the most by the crisis, especially South European countries (Barbieri and Scherer, 2009; Dunford, 2012). Therefore it is acceptable to say that employment has been affected by the ongoing financial crisis to a great extent. But beyond these alarming data on employment, tourism sector seems to be a bright spot. Recent data show that tourism industry has not been affected by the economic crisis, at least not to the extent that this has happened to other industries. For example, accommodation has an

average annual growth rate of 0.9 % since 2008. This illustrates the dynamic character of tourism sector and its potential as a growth sector.

The purpose of this paper is to capture the regional dimension of employment in the tourism sector of Greece. More specifically, quantitative methods will be used to evaluate any trends in tourism employment between island and mainland regions, the effect on the regions' development as measured by the GDP change and the effect of financial crisis on these trends.

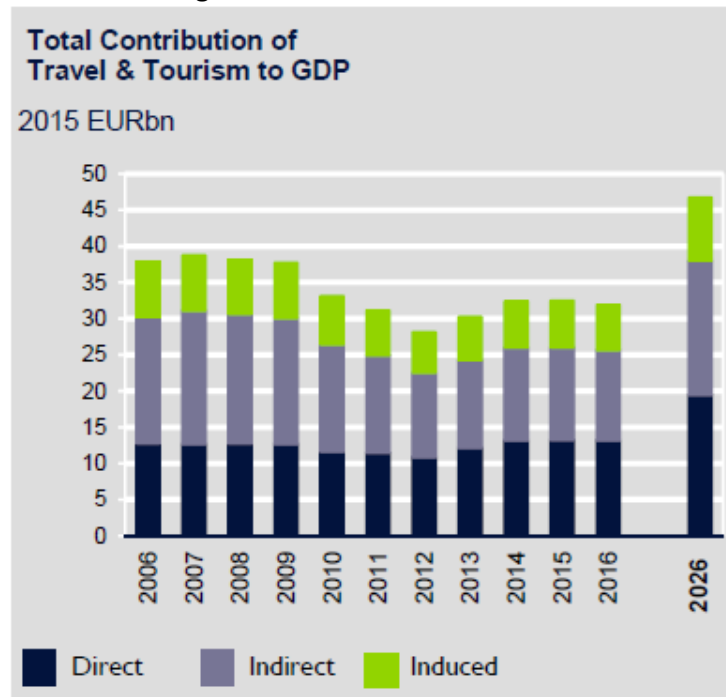
The methodological framework used in this analysis includes quantitative methods in order to identify existing patterns of tourism employment among island and mainland regions and the effect of those patterns on the regions' development. More specifically, data refer to employment and Gross Value Added, tourist density indices, occupancy indices for the 13 Greek regions, for the period 2000-2013. For the purpose of this analysis, statistical measures of dispersion and concentration are used, such as, the Herfindahl-Hirschman Index, the Krugman Dissimilation Index and the coefficient of absolute structural changes as well as specific tourist indices, such as tourist density indices and occupancy indices.

Finally, the findings of this analysis are compared to the findings of a similar research that was conducted before the financial crisis.

2. TOURISM'S CONTRIBUTION TO GREEK ECONOMY

Greece has been a major tourist destination and attraction in Europe and has attracted 26.5 million visitors in 2015 making Greece one of the most visited countries in Europe and the world. World Travel and Tourism Council's report announced that the direct contribution of Travel & Tourism to GDP in 2015 was EUR13.3bn (7.6% of GDP) with a forecast to fall by 0.5% in 2016 and a forecast to grow by 4.0% pa to EUR19.5bn (9.3% of GDP) by 2026. The total contribution of Travel & Tourism to GDP was EUR32.5bn (18.5% of GDP) in 2015, and is forecast to fall by 1.8% in 2016, and to rise by 3.9% pa to EUR46.7bn (22.4% of GDP) in 2026. Regarding employment, in 2015, the total contribution including jobs indirectly supported by the industry, was 23.1% of total employment (822,000 jobs). The prediction is to fall by 0.6% in 2016 and rise by 3.0% in 2026 (28.0% of total) (WTTC Report for Greece, 2016). These data reflect the importance of tourism sector in Greece's economic development and justifies the relevant research that has been conducted on the topic these last years.

Figure 1: Contribution of tourism



Source: WTTC, Travel and Tourism Economic Impact, Greece, 2016

Table 1
Greek Tourism 2015- Facts & Figures

Contribution to GDP	18,5%
International Tourism Arrivals	23,6 mi
Average per Capita Tourism Expenditure	579,6 euro
Employment	822.000 (23,1% of total employment)
Seasonality	56% of international tourist arrivals take place in the period July – August – September 2012
Hotel Capacity	10.123 units, 415.246 beds
Top Origin Markets Based on International Tourism Receipts	FYROM (12,8%), Germany (11,9%), United Kingdom (10,2%), Bulgaria (8,1%), France (6,4%), Italy (5,7%)

Source: SETE 2016

Although some of the main countries of origin of visitors were in the past Germany and the United Kingdom, in the last decade, new countries emerged in the international tourism market, mainly Russia and the neighboring Balkan countries, from which Greece attracts a large number of visitors. In particular, in 2015 12,8% of tourists came from FYROM and 8,1% from Bulgaria. On the other hand, visitors from countries such as Australia, Canada, China or Japan, are at a low percentage which indicates that there are important markets from which Greece could gain an even greater share.

According to the latest data from the WEF (Table 2), Spain, one of Greece's main competitors, comes first at the overall ranking in competitiveness gaining 3 positions since 2013. Greece has a medium performance in the competitiveness of the tourism sector but gained one position in the overall ranking for the competitiveness of the travel and tourism sector reaching the 31st place in 2015 from the 32nd place in 2013. Among Greece's other

competitors, Italy is in the 8th place, Portugal is in the 15th place, Cyprus is in the 36th place and Turkey is in the 44th place.

Table 2
Travel & Tourism Competitiveness Index 2015 and 2013 Comparison

Countries	Overall Index			
	2015		2013	
	Overall Rank	Score	Overall Rank	Score
Spain	1	5,31	4	5,38
France	2	5,24	7	5,31
Germany	3	5,22	2	5,39
USA	4	5,12	6	5,32
United Kingdom	5	5,12	5	5,38
Switzerland	6	4,99	1	5,66
Australia	7	4,98	11	5,17
Italy	8	4,98	26	4,90
Austria	12	4,82	3	5,39
Portugal	15	4,64	20	5,01
Cyprus	36	4,25	29	4,84
GREECE	31	4,36	32	4,75
Turkey	44	4,08	46	4,44
Morocco	62	3,81	71	4,03
Egypt	83	3,49	85	3,88

Source: World Economic Forum 2013, 2015

Table 3 presents Greece's Travel & Tourism Competitiveness Index and sub indices in 2015. The country's position in Infrastructure is quite good (24th) while Greece hold the 9th position in the Health and Hygiene sub-index.

Table 3
Greece's Travel & Tourism Competitiveness Index 2015

The Travel & Tourism Competitiveness Index

	Rank (out of 141)	Score (1–7)
Travel & Tourism Competitiveness Index	31	4.36
Enabling Environment	48	5.11
Business Environment	104	4.04
Safety and Security	57	5.49
Health and Hygiene	9	6.57
Human Resources and Labour Market	45	4.75
ICT Readiness	49	4.71
T&T Policy and Enabling Conditions	33	4.39
Prioritization of Travel & Tourism	24	5.36
International Openness	25	4.09
Price Competitiveness	113	3.93
Environmental Sustainability	61	4.19
Infrastructure	24	4.78
Air Transport Infrastructure	27	4.25
Ground and Port Infrastructure	51	4.01
Tourist Service Infrastructure	12	6.08
Natural and Cultural Resources	35	3.15
Natural Resources	46	3.49
Cultural Resources and Business Travel	32	2.82

Source: World Economic Forum 2015

Table 4 presents data on regional level. According to these data, the contribution of tourism to the GDP of several regions is quite impressive. In 2014, this contribution reached 56.0% in Crete, 72% in South Aegean and 63% in the Ionian Islands.

Table 4
Tourism in Greece's regions

Region	% Distribution of hotel overnight stays 2015	Proportion of direct tourism expenditure 2015 - in € m	Region GDP 2014 - in € m	Direct Contribution of tourism to Region GDP with 2014 data	per capita GDP 2014 - in €
Crete	27.5%	4,828	8,693	56%	13,773
S. Aegean	24.5%	4,304	5,993	72%	17,899
Ionian Islands	10.9%	1,921	3,074	63%	14,826
Central Macedonia	10.7%	1,875	23,732	8%	12,500
Attica	10.4%	1,830	86,001	2%	22,377
Peloponnese	3.2%	567	7,674	7%	13,134
Thessaly	2.6%	453	9,003	5%	12,237
Eastern Macedonia & Thrace	2.3%	412	6,903	6%	11,366
N. Aegean	2.3%	404	2,560	16%	12,919
West Greece	2.3%	398	8,250	5%	12,214
Stereia Ellada	1.7%	307	7,772	4%	13,917
Epirus	1.2%	204	3,947	5%	11,606
West Macedonia	0.4%	66	4,337	2%	15,624
Total Country	100.0%	17,571	177,941	10%	16,336

Source: SETE 2015

The above table reveals the uneven development of tourism and its contribution among the Greek regions. It is worth noticing that there are regions, such as West Macedonia and Sterea Ellada, who can be characterizes as non-tourism regions as have a low percentage of tourists and overnight stays.

Finally, according to the World Travel and Tourism Competitiveness report, for 2017, tourism will boost its contribution to the Greek economy by 6.9 percent amounting to 35 billion euros or 19.6 percent. Tourism will support over 914,500 jobs, while the country is set to receive approximately 26.1 million visitors.

Concluding we could say that tourism plays a significant role in Greece's economic development due to the fact that it is and economic activity that generates income, contributes to GDP growth, encourages investment and stimulates employment. It is therefore, reasonable to say that tourism could be the key for the country's recovery from the ongoing financial crises.

3. METHODOLOGY

As we have already pointed the purpose of this paper is to capture the regional dimension of employment in the tourism sector of Greece. More specifically, quantitative methods are used to evaluate any trends in tourism employment between island and mainland regions, the effect on the regions' development as measured by the GDP change and the effect of financial crisis on these trends.

The methodological framework used in this analysis includes quantitative methods in order to identify existing patterns of tourism employment among island and mainland regions and the effect of those patterns on the regions' development. More specifically, data refer to employment and Gross Value Added, tourist density indices, occupancy indices for the 13 Greek regions, for the period 2000-2013. For the purpose of this analysis, statistical measures of dispersion and concentration are used, such as, the Herfindahl-Hirschman

Index, the Krugman Dissimilation Index and the coefficient of absolute structural changes as well as specific tourist indices, such as tourist density indices and occupancy indices.

Herfindahl-Hirschman Index

It is probably the most commonly used indicator of concentration/specialization and is a commonly accepted statistical measure of market concentration and specialization. The Hirschman-Herfindahl Index of spatial concentration captures the degree to which a particular industry's spatial distribution reflects that of the national urban hierarchy (McCann, 2001). It is also referred to as the absolute concentration and specialization index. The value of the index is between 0 and 1, depending on the measure of absolute concentration and specialization. When reaching its upper limit of 1, then the sector j is concentrated to one region or the region i is specialized in only one sector. At its lowest level of concentration, all regions have equal shares in sector j , and at its lowest level of specialization all sectors have equal shares in region i .

$$H_j^C = \sum_{i=1}^n (g_{ij}^C)^2, H_i^S = \sum_{j=1}^m (g_{ij}^S)^2$$

where
$$g_{ij}^C = \frac{X_{ij}}{\sum_{i=1}^n X_{ij}} = \frac{X_{ij}}{X_j} \quad \text{and}$$

$$g_{ij}^S = \frac{X_{ij}}{\sum_{j=1}^m X_{ij}} = \frac{X_{ij}}{X_i}$$

H_j^C	Herfindahl-Hirschman concentration Index
H_i^S	Herfindahl-Hirschman specialization Index
i	region
j	sector
X	number of employees ;
X_{ij}	i region's number of employees in j sector;
X_j	all employees of j sector;
X_i	all employees of i region;
g_{ij}^C	the share of region i in the total national value of sector j ;
g_{ij}^S	the share of sector j in the total value of region i .

Krugman Dissimilation Index

It is used for measuring either concentration or specialization. It is a relative measure of specialisation/concentration which compares one sector/region with the overall economy. A slightly different form of the index may be used to compare two countries/regions. Its values range from 0 (when all territorial/sectoral structures are identical) to 2 (for totally different structures).

$$K_j^C = \sum_{i=1}^n |g_{ij}^C - g_j^C| \quad K_i^S = \sum_{j=1}^m |g_{ij}^S - g_i^S|$$

$$g_i^C = \frac{X_i}{X}, \quad g_j^S = \frac{X_j}{X}$$

g_{ij}^c	the share of region i in the total national value of sector j
g_{ij}^s	the share of sector j in the total value of region i
X	Total Gross Value Added, or employment

The relative concentration analyzes the distribution of the activities of an industry compared to the average of the distribution of the whole of the activities.

Coefficient of absolute structural changes

It is used for measuring the average change in sectoral or territorial shares recorded in different units of time:

$$\tau_{g_1-g_0} = \sqrt{\frac{\sum_{i=1}^n (g_{1i} - g_{0i})^2}{n}},$$

Where g_{1i} and g_{0i} are the sectoral or regional shares i in two time periods 1 and 0.

The indicator increases with the intensity of the time changes in either specialization or concentration.

4. FINDINGS

Table 5 and Figures 2-3 show the data of employment and Total gross value added, by region, and accommodation and food industry (sector 55 and 56) and in total for the years 2007, 2010, 2013, 2015. As we can see, total employment has declined from 2007 to 2015 but employment in accommodation and food industry has declined originally and showed an increase in 2015. This applies especially for the case of island regions and regions who have a tourism development. In the case of Total Gross Value Added, we notice that there is a decrease from 2007 to 2015 for every region. This applies for the accommodation and food industry as well, except for the case of Crete, North Aegean and Atikki whose GVA has shown an increase. South Aegean, Crete and Ionian Islands have the highest contribution of employment in accommodation and food industry in total employment. This also applies for Gross Value Added.

Table 5

Employment in Accommodation and Food Industry				
Regions	2007	2010	2013	2015
East Macedonia and Thrace	13353	15421	9040	16282
Centra Macedonia	46778	45432	41631	45499
West Macedonia	6153	6927	5233	5991
Ipeiros	10898	12807	8810	10187
Thessaly	17826	19808	12820	19259
Ionian Islands	16145	12464	10760	9634
West Greece	18067	16203	14877	19191
Centra Greece	16310	13119	13116	14024
Peloponnisos	89896	90243	71811	86424
Attiki	15218	16910	14399	16154
North Aegean	6809	7099	5548	5346
South Aegean	23947	21278	23534	24234
Crete	30058	30743	27628	32880
Total	288191	308452	259206	305105

Source: Hellenic Statistical Authority

Table 6

Gross Value Added in Accommodation and Food Industry				
Regions	2007	2010	2013	2015
East Macedonia and Thrace	356	352	302	301
Centra Macedonia	1.363	1.288	1.165	1.161
West Macedonia	145	121	101	101
Ipeiros	258	240	215	214
Thessaly	532	451	383	378
Ionian Islands	807	650	608	624
West Greece	387	348	297	294
Centra Greece	383	317	278	278
Peloponnisos	481	406	373	376
Attiki	2.709	2.901	2.790	2.794
North Aegean	289	240	201	200
South Aegean	1.334	1.334	1.426	1.442
Crete	1.115	1.164	1.282	1.324
Total	10.160	9.812	9.421	9.490

Source: Hellenic Statistical Authority

Table 7

% Employment in Accommodation and Food Industry in Total Employment				
	2007	2010	2013	2015
East Macedonia and Thrace	6%	7%	5%	8%
Central Macedonia	6%	6%	8%	8%
West Macedonia	6%	7%	7%	7%
Ipeiros	8%	10%	8%	10%
Thessaly	6%	7%	5%	8%
Ionian Islands	20%	15%	14%	13%
West Greece	7%	6%	7%	9%
Central Greece	7%	6%	8%	8%
Peloponnisos	6%	7%	8%	8%
Attiki	5%	5%	5%	6%
North Aegean	9%	10%	8%	8%
South Aegean	18%	16%	19%	18%
Crete	11%	12%	13%	16%
Total	6%	7%	7%	8%

Source: Hellenic Statistical Authority

Table 8

% GVA in Accommodation and Food Industry in Total Gross Value Added				
	2007	2010	2013	2015
East Macedonia and Thrace	5%	4%	5%	5%
Central Macedonia	5%	5%	5%	6%
West Macedonia	3%	3%	3%	3%
Ipeiros	6%	6%	6%	6%
Thessaly	5%	5%	5%	5%
Ionian Islands	21%	18%	22%	23%
West Greece	4%	4%	4%	4%
Central Greece	4%	4%	4%	4%
Peloponnisos	6%	5%	5%	6%
Attiki	3%	3%	4%	4%
North Aegean	10%	9%	9%	9%
South Aegean	20%	21%	27%	27%
Crete	11%	12%	17%	17%
Total	6%	7%	7%	8%

Source: Hellenic Statistical Authority

Figure 2: Employment

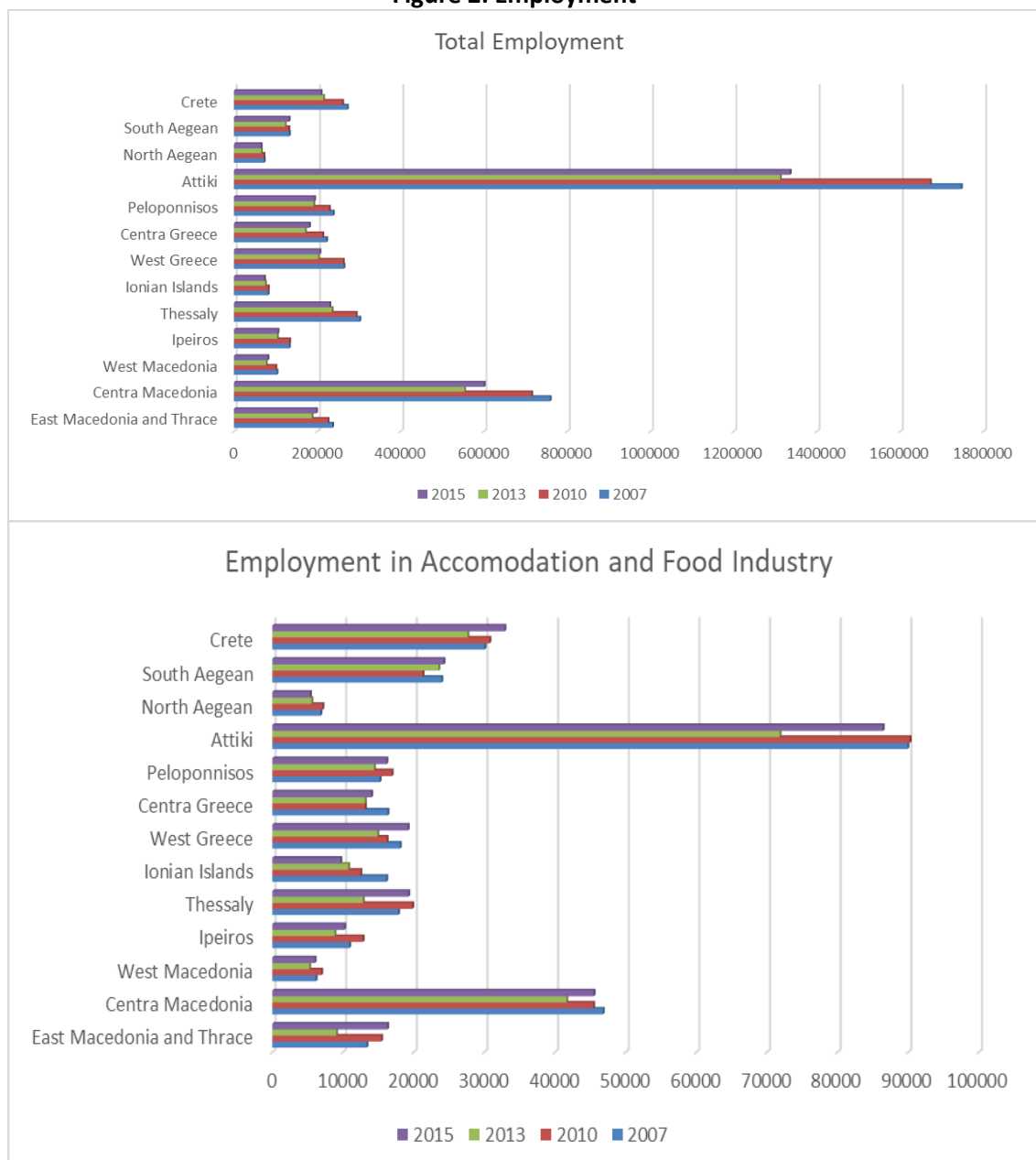
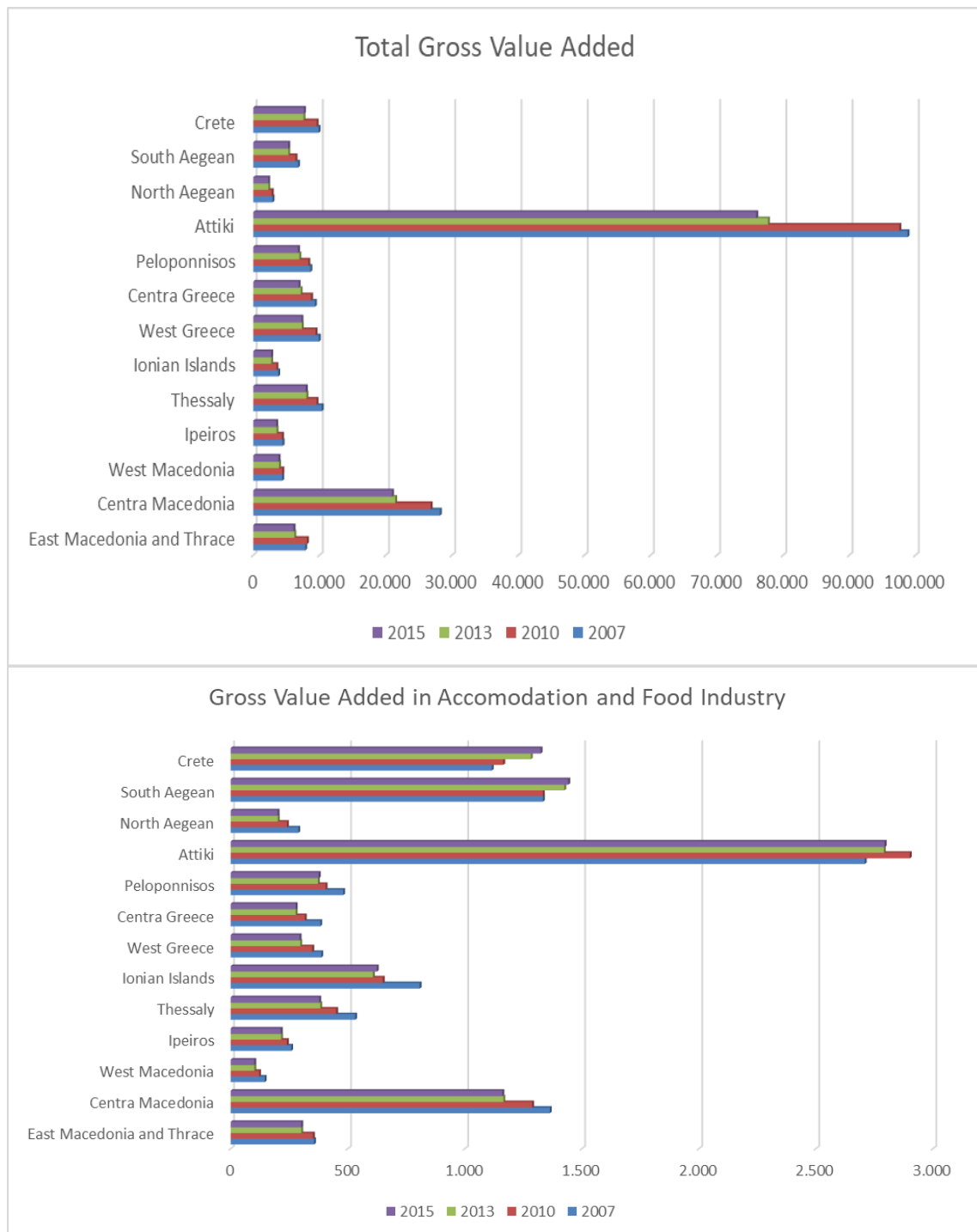


Figure 3: Gross Value Added



Based on the above statistics, Tables 9 and 9A represent statistical estimates of the indicators for the years 2007 to 2015 based on based on concentration ratios of Herfindahl-Hirschman Index (g^c) and Krugman Dissimilarity Index (k^c). Figures 4 and 4A show the graphs of these estimates. As we can see from table 9, most regions show a decline in HHI from 2010 to 2015 with the exception of Crete and South Aegean. In addition, in 2015 Attiki is the region with the highest indicator, followed by South Aegean, Crete and Central Macedonia. This means that those regions have a moderate concentration which is

explained by the fact that those regions attract significant amount of the tourism flows. All the other regions have low values of the indicator, showing no significant concentration. Finally, as we can see from Table 9A, South Aegean is the region which has the highest concentration, followed by South Aegean, Crete, Central Macedonia and Ionian Islands, all regions with intense tourism development. This is also compatible with the conclusions drawn for HHI.

Table 9

g^c	Concentration Indices			
Regions	2007	2010	2013	2015
East Macedonia and Thrac	0,0351	0,0358	0,0320	0,0318
Central Macedonia	0,1342	0,1313	0,1237	0,1223
West Macedonia	0,0143	0,0124	0,0107	0,0106
Ipeiros	0,0254	0,0245	0,0228	0,0226
Thessaly	0,0523	0,0459	0,0406	0,0399
Ionian Islands	0,0795	0,0662	0,0645	0,0658
West Greece	0,0381	0,0355	0,0316	0,0310
Centra Greece	0,0377	0,0323	0,0295	0,0293
Peloponnisos	0,0473	0,0413	0,0395	0,0397
Attiki	0,2666	0,2957	0,2962	0,2944
North Aegean	0,0284	0,0245	0,0214	0,0211
South Aegean	0,1313	0,1359	0,1513	0,1520
Crete	0,1098	0,1187	0,1361	0,1395

Table 9A

Krugman Dissimilarity					
Regions	2007 (g^c - gⁱ)	2010 (g^c - gⁱ)	2013 (g^c - gⁱ)	2015 (g^c - gⁱ)	K^c
East Macedonia and	0,0113	0,0142	0,0029	0,0216	0,0499
Central Macedonia	0,0281	0,0160	0,0369	0,0268	0,1079
West Macedonia	0,0070	0,0101	0,0094	0,0090	0,0356
Ipeiros	0,0124	0,0170	0,0111	0,0108	0,0514
Thessaly	0,0095	0,0183	0,0088	0,0232	0,0599
Ionian Islands	0,0234	0,0258	0,0230	0,0342	0,1065
West Greece	0,0246	0,0170	0,0258	0,0319	0,0993
Centra Greece	0,0189	0,0102	0,0211	0,0167	0,0669
Peloponnisos	0,0055	0,0135	0,0160	0,0133	0,0483
Attiki	0,0453	0,0031	0,0192	0,0112	0,0787
North Aegean	0,0048	0,0015	0,0000	0,0036	0,0099
South Aegean	0,0482	0,0669	0,0605	0,0725	0,2482
Crete	0,0055	0,0190	0,0295	0,0318	0,0858

Figure 4

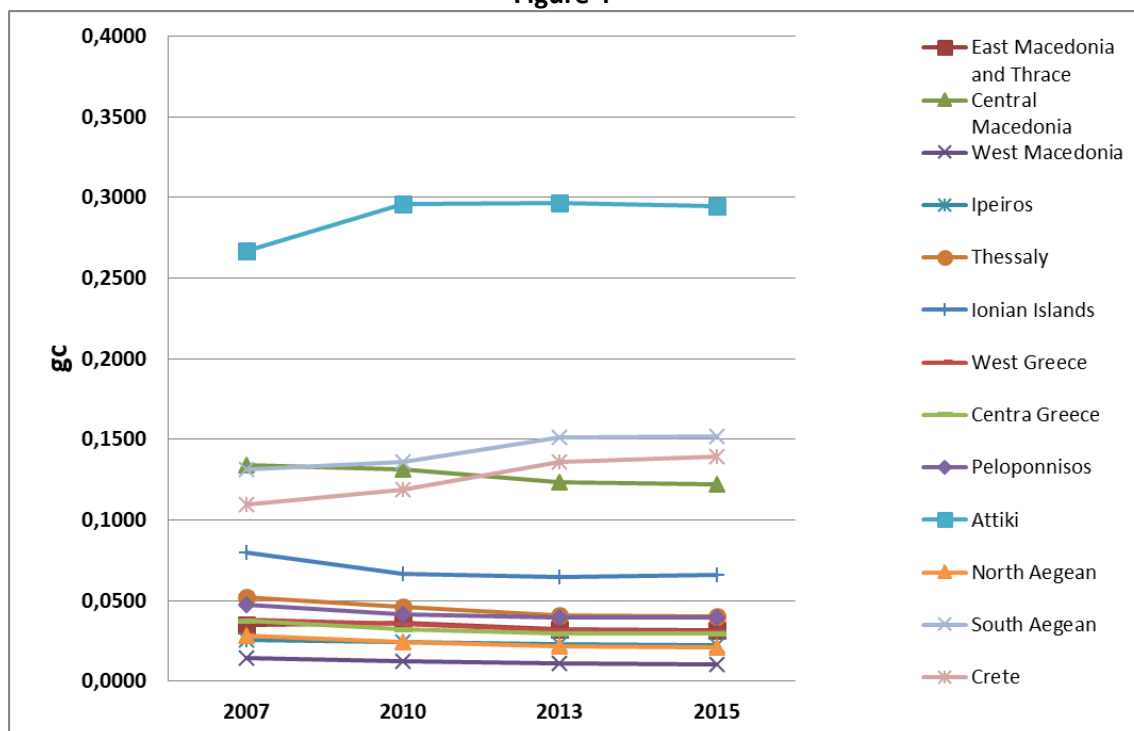
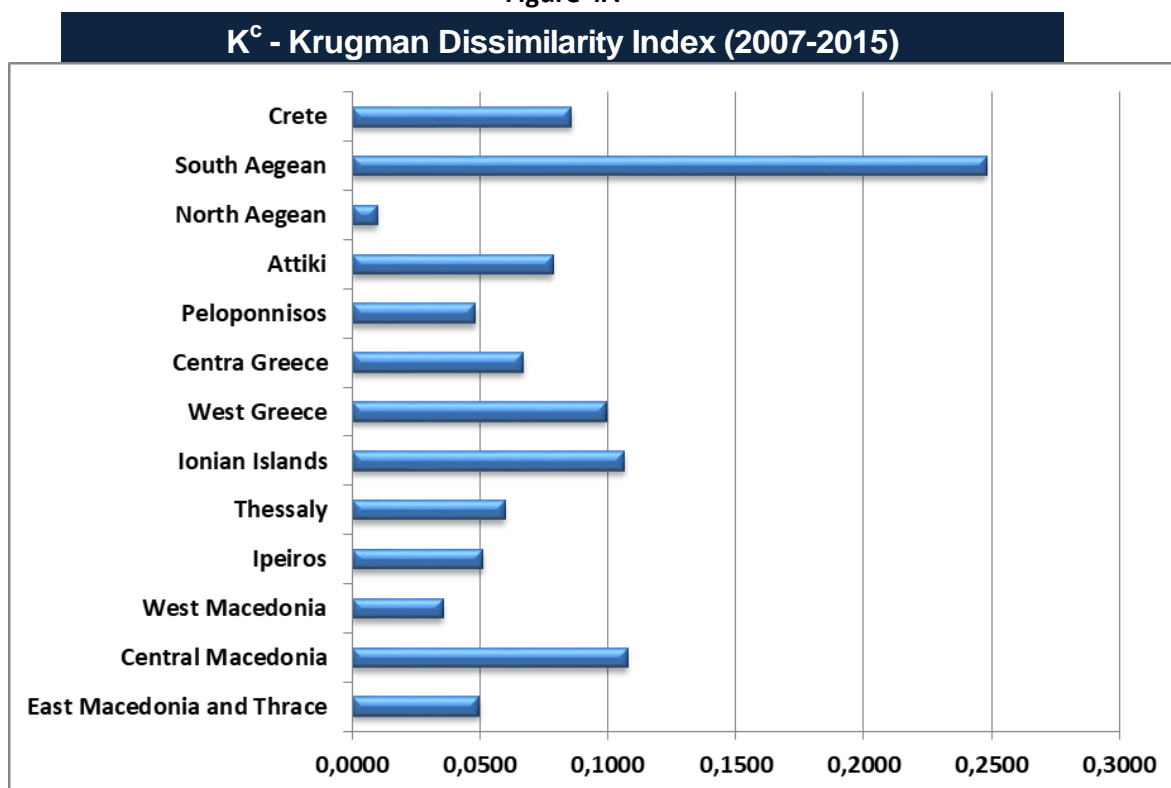


Figure 4A



Tables 10 and 10A represent the statistical estimates of the indicators for the years 2007 to 2015 based on the specialization ratios of Herfindahl-Hirschman Index (gs) and Krugman

Dissimilarity Index (k^s). Figures 5 and 5A show the graphs of these estimates. As we can see in Table 10, all regions show an increase in specialization index from 2007 to 2015. The highest levels of specialization for the year 2007 and 2015 are in island regions with intense tourism development, i.e. Ionian Islands, South Aegean and Crete. This is an indication that those regions have the tourism sector as the dominant one and have their development based on it. Regarding Krugman's Dissimilarity Index in Table 10A, the highest values apply for Peloponnisos, followed by South Aegean, Ionian Islands and Crete. Therefore, the same pattern seems to apply in that case as well.

Table 10

g^s Specialization Indices				
Regions	2007	2010	2013	2015
East Macedonia and Thrac	0,045	0,043	0,049	0,049
Central Macedonia	0,048	0,048	0,054	0,055
West Macedonia	0,033	0,028	0,026	0,026
Ipeiros	0,058	0,055	0,061	0,061
Thessaly	0,051	0,047	0,048	0,048
Ionian Islands	0,214	0,184	0,223	0,230
West Greece	0,039	0,037	0,041	0,040
Centra Greece	0,041	0,036	0,039	0,040
Peloponnisos	0,056	0,049	0,054	0,056
Attiki	0,027	0,030	0,036	0,037
North Aegean	0,099	0,085	0,088	0,089
South Aegean	0,197	0,209	0,269	0,272
Crete	0,113	0,121	0,169	0,172

Table 10A

Krugman Dissimilarity					
Regions	2007 ($g^s - g^i$)	2010 ($g^s - g^i$)	2013 ($g^s - g^i$)	2015 ($g^s - g^i$)	K^s
East Macedonia and Thrac	0,0111	0,0251	0,0003	0,0328	0,0693
Central Macedonia	0,0132	0,0155	0,0209	0,0204	0,0700
West Macedonia	0,0266	0,0415	0,0419	0,0475	0,1576
Ipeiros	0,0237	0,0409	0,0240	0,0353	0,1239
Thessaly	0,0077	0,0205	0,0068	0,0362	0,0712
Ionian Islands	0,0160	0,0327	0,0803	0,0979	0,2269
West Greece	0,0294	0,0248	0,0329	0,0527	0,1398
Centra Greece	0,0323	0,0253	0,0378	0,0370	0,1324
Peloponnisos	0,0082	0,0252	0,0217	0,0281	0,0833
Attiki	0,0240	0,0242	0,0188	0,0279	0,0950
North Aegean	0,0051	0,0137	0,0036	0,0064	0,0288
South Aegean	0,0166	0,0467	0,0770	0,0892	0,2296
Crete	0,0025	0,0035	0,0402	0,0152	0,0613

Figure5

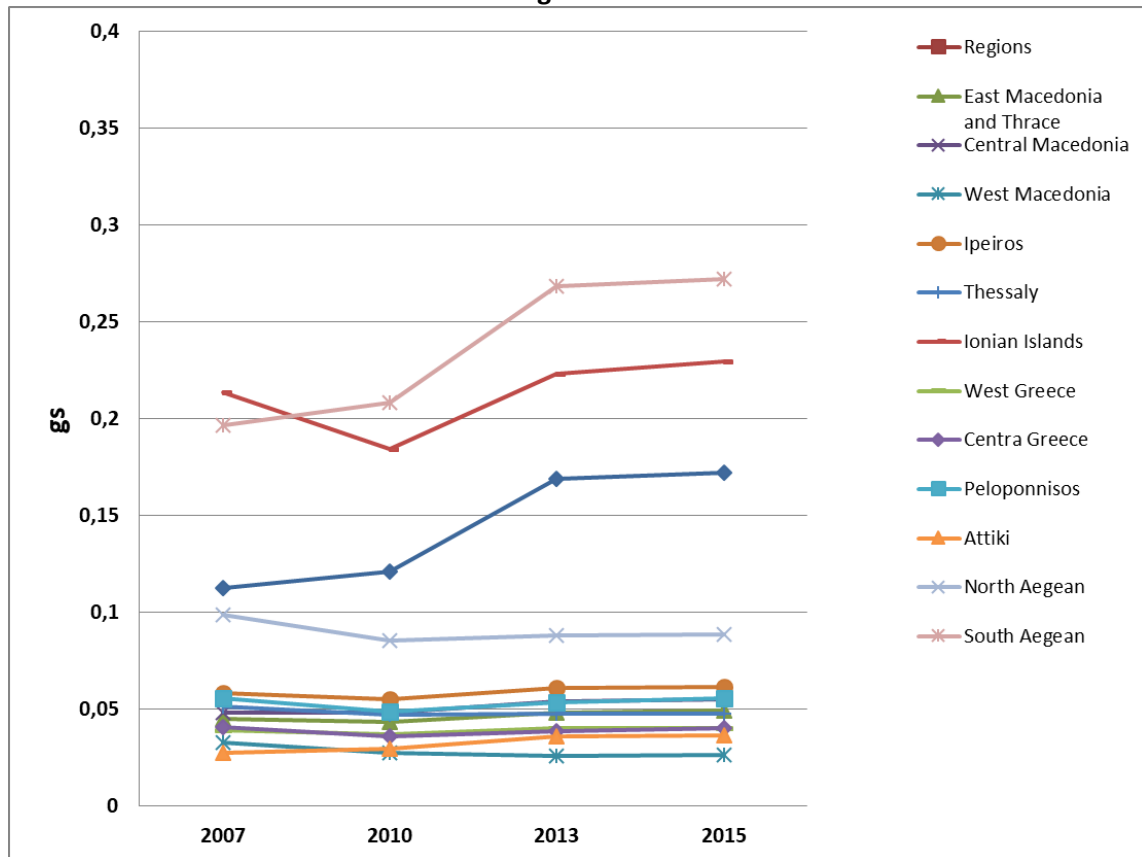
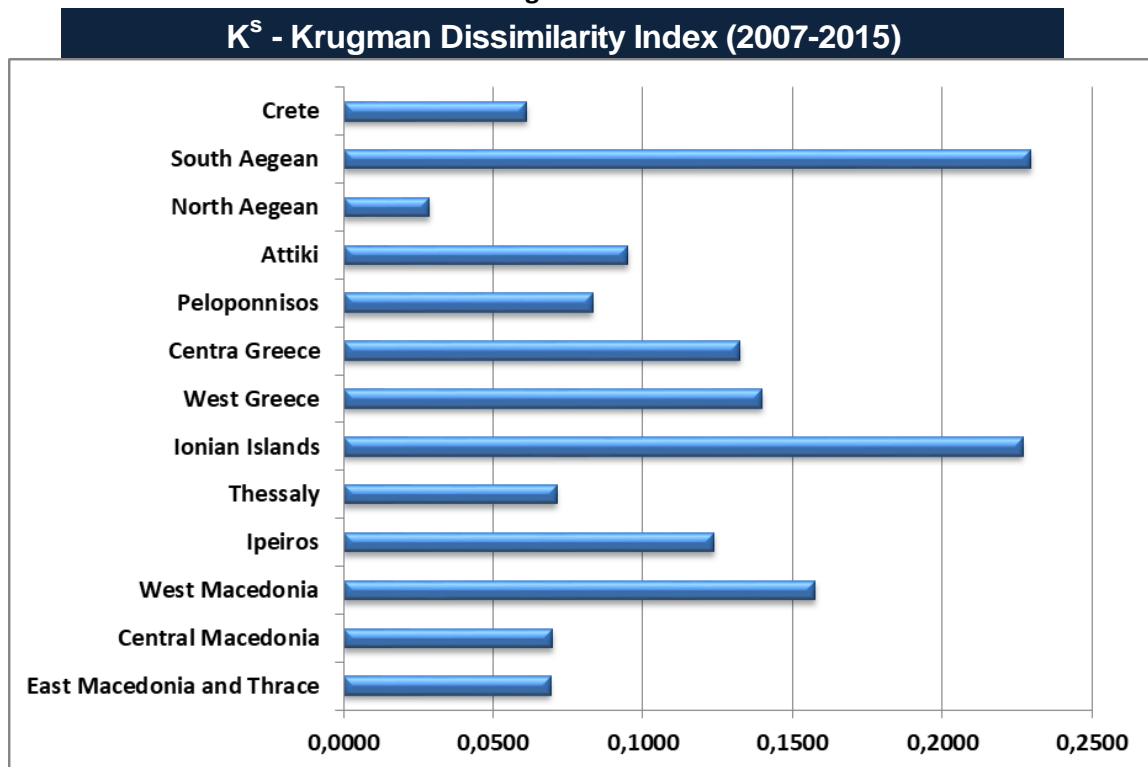


Figure 5A



Tables 11 and 11A show the rates of the coefficient of absolute structural changes for the time period 2007-2010, 2010-2013 2013-2015. Figures 6 and 6A show the graphs of these estimates.

The values of the coefficient of absolute structural changes have a small variation from a region to another or between the time periods examined. There was not a specific pattern of change, since for some regions there was a reduction of its values (i.e. Attica), and an increase for others (i.e. Crete, South Aegean).

Table 11

Coefficient of absolute structural changes				
Regions	2010/2007	2013/2010	2015/2013	T
	(g2010-g2007)²	(g2013-g2010)²	(g2015-g2013)²	
East Macedonia and Thrace	0,000013	0,000229	0,000342	0,013950
Central Macedonia	0,000226	0,000177	0,000132	0,013354
West Macedonia	0,000001	0,000005	0,000000	0,001492
Ipeiros	0,000014	0,000057	0,000000	0,004858
Thessaly	0,000006	0,000218	0,000187	0,011692
Ionian Islands	0,000244	0,000001	0,000099	0,010705
West Greece	0,000103	0,000024	0,000030	0,007238
Centra Greece	0,000198	0,000065	0,000021	0,009736
Peloponnisos	0,000004	0,000001	0,000007	0,001948
Attiki	0,000375	0,000241	0,000039	0,014773
North Aegean	0,000000	0,000003	0,000015	0,002452
South Aegean	0,000199	0,000476	0,000129	0,016372
Crete	0,000021	0,000048	0,000001	0,004854

Table 11A

coefficient of absolute structural changes						
Regions	2010/2007		2013/2010		2015/2013	
	(g2010-g2007)²	T	(g2013-g2010)²	T	(g2015-g2013)²	T
East Macedonia and Thrace	0,00001	0,00366	0,00013	0,01146	0,00005	0,00703
Central Macedonia	0,00023	0,01503	0,00000	0,00171	0,00017	0,01319
West Macedonia	0,00000	0,00111	0,00000	0,00116	0,00000	0,00171
Ipeiros	0,00001	0,00370	0,00001	0,00383	0,00002	0,00443
Thessaly	0,00001	0,00236	0,00015	0,01240	0,00000	0,00127
Ionian Islands	0,00024	0,01562	0,00021	0,01451	0,00060	0,02445
West Greece	0,00010	0,01016	0,00003	0,00530	0,00000	0,00021
Centra Greece	0,00020	0,01406	0,00004	0,00599	0,00011	0,01063
Peloponnisos	0,00000	0,00202	0,00001	0,00275	0,00000	0,00014
Attiki	0,00038	0,01937	0,00122	0,03489	0,00082	0,02867
North Aegean	0,00000	0,00061	0,00000	0,00222	0,00004	0,00610
South Aegean	0,00020	0,01411	0,00006	0,00770	0,00001	0,00367
Crete	0,00002	0,00463	0,00001	0,00229	0,00001	0,00347

Figure 6

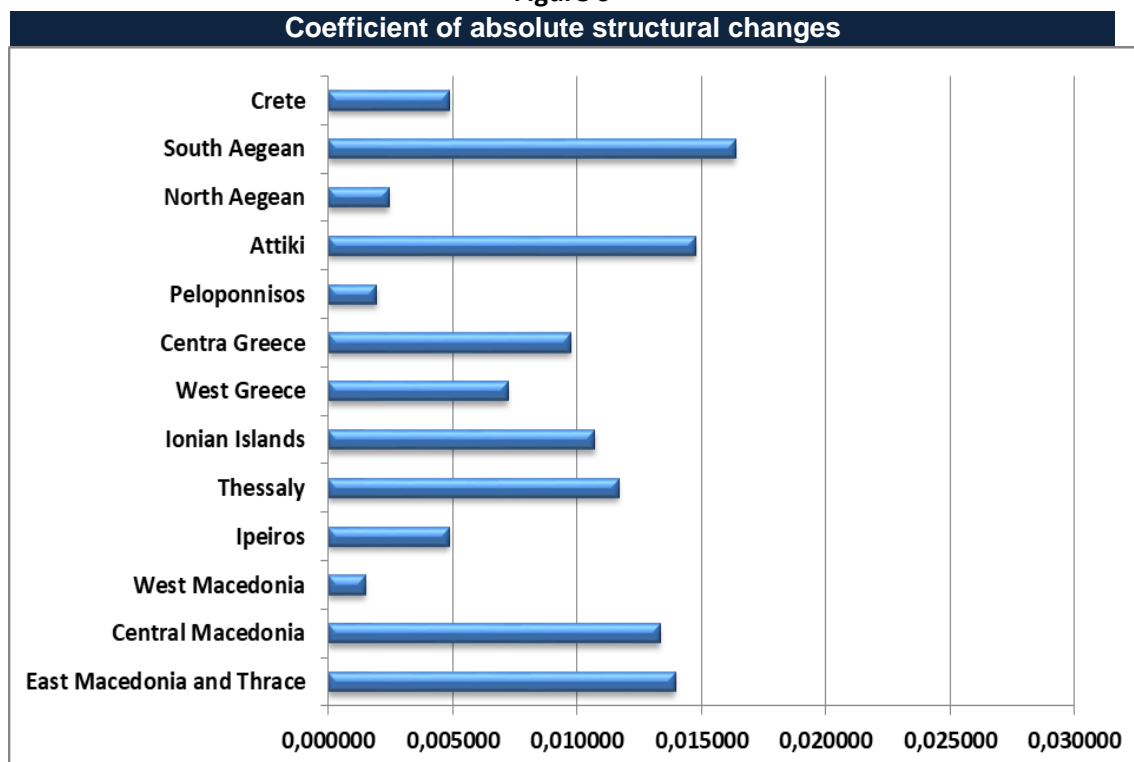
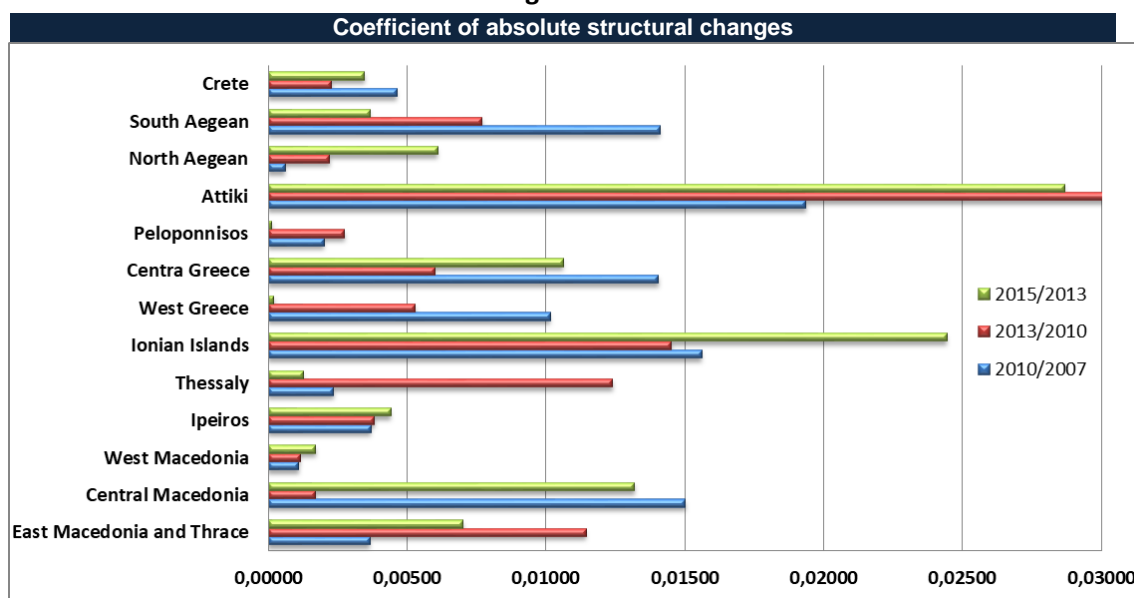


Figure 6A



As a further step and in order to examine whether the type of region, i.e. island or mainland one has a significant effect on Gross Value Added and employment derived from tourism activities an independent samples t – test was conducted. Table 12 presents the results of the non-parametric Mann Whitney U Test, as the assumption of normality was not met.

Table 12: Mann Whitney U Test for Differences of Employment and GVA in tourism between Regions

Test Statistics ^a								
	Employment in Accomodation and Food Industry in 2007	Employment in Accomodation and Food Industry in 2010	Employment in Accomodation and Food Industry in 2013	Employment in Accomodation and Food Industry in 2015	Gross Value Added in Accomodation and Food Industry in 2007	Gross Value Added in Accomodation and Food Industry in 2010	Gross Value Added in Accomodation and Food Industry in 2013	Gross Value Added in Accomodation and Food Industry in 2015
Mann-Whitney U	17,000	16,000	18,000	15,000	13,000	12,500	12,000	12,000
Wilcoxon W	62,000	26,000	28,000	25,000	58,000	57,500	57,000	57,000
Z	-,154	-,309	,000	-,463	-,772	-,850	-,926	-,926
Asymp. Sig. (2-tailed)	,877	,758	1,000	,643	,440	,395	,355	,355
Exact Sig. [2*(1-tailed Sig.)]	,940 ^b	,825 ^b	1,000 ^b	,710 ^b	,503 ^b	,414 ^b	,414 ^b	,414 ^b

a. Grouping Variable: Type of region

b. Not corrected for ties.

According to the results, there is no statistically significant effect of the region on GVA and Employment regarding tourism activities. This finding suggests that differences in employment and GVA derived from tourism industry are not depended or affected by the type of the region.

4. CONCLUSIONS

According to the theoretical background of regional tourism development inequalities exist as a result of the tourism development. In addition, the current financial crisis has affected the country's economy and employment. Nevertheless, there are regions that show signs of resilience. Especially island regions seem to have managed to adapt to the new conditions and reacted positively to the ongoing crisis, having as a result positive indications in indexes such as GVA and Employment.

Data show that there is a concentration of tourism in Greece's island regions, which results in a spatial centralization of tourism development. This concentration increases any regional disparities. More particularly, island regions show a high concentration of tourism activities, causing a spatial centralization of tourism development and a consequent uneven employment rate. Of course, due to the seasonality of tourism, these employment rates should be considered in caution.

Total employment and total Gross Value Added decreased through years 2007 – 2015. On the other hand, employment and Gross Value Added in accommodation and food industry showed a decrease in specific regions only and an increase in island and other tourism regions. In addition, regions such as island ones or regions which traditionally attract tourists (i.e. Central Macedonia) show moderate concertation in their activities and a specialization in one activity, i.e. tourism.

Finally, there seems to be no statistically significant difference between island and mainland regions regarding employment and GVA. This can be explained by the fact that although Greece is known for its islands, there are still mainland regions who attract a significant amount of tourists as they have put their efforts in alternative forms of tourism.

The comparison with the findings in our previous work that took place before the financial crisis and was referring to the years 2000 to 2007 reveals that there some noticeable differences.

- Employment in tourism sector and Gross Value Added for that specific sector had gradually increased for the years 2000-2007 in all regions, while this was the case for only the island regions for the years 2007-2015. This finding actually reveals that tourism was a dominant sector for almost all regions before the economic crisis. During this crisis, only regions which had a strong advantage on tourism managed to be resilient and retain their position in the tourism industry.
- In addition, the period 2000-2007 showed signs of concentration of tourism activities to specific regions, ie. Crete, South Aegean and Central Macedonia. This was the case also for the next period under study with the exception that this concentration was present to North Aegean as well.
- Finally, tourism sector was dominant for the case of the Ionian Islands, South Aegean and Crete, as they had high values of specialization indexes. These region had their development based on that sector for the period 2000-2007. For the following period this was also the case with the addition of North Aegean.

Comparing these two periods, 2000-2007 and 2007-2015 we could say that any tourism inequalities between regions for the first period seem to be present in the second one as well. These inequalities can be explained by

- the different tourism images of these regions (island regions in the Aegean and Ionian Sea vs mainland isolated regions)
- the different infrastructure among them (islands with easy access to them and large amount of accommodation vs remote regions with poor transportation and small amount of accommodation)
- different types of tourism development (mass tourism in several islands vs alternative forms of tourism in specific regions such as Ipeiros or Macedonia)

However, the fact that, despite the financial crisis Greece has managed to retain its place in the tourism market should be considered as a sign that the country can overcome the problems caused by this crisis by investing in a tourism policy that is based on a more balanced and sustainable development for the regions.

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