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**Conference Paper**

## The impact of economic crisis on Greek regions and the importance of regional resilience

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# **“The impact of economic crisis on Greek regions and the importance of regional resilience”**

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## **Abstract**

The global economic crisis of 2008 has affected all European countries; Greece of course could not be the exception to this “rule”. First, the fact that Greece was unable to mitigate its public expenditures and to increase its revenues in comparison with the other European countries and other the weaknesses of the Economic and Monetary Union (EMU) design which led to a structural asymmetry within the Eurozone, contributed to Greece’s “acquaintance” with the economic crisis. Its impact on Greek regions has become more intense during the last three years. Taking into consideration some indicators which are directly affiliated with the economic and social welfare, for example GDP, disposal income, employment/unemployment, population, infant mortality, proportion of pupils etc, before and after the crisis it is easily ascertained that the Greek regions are moved to unprecedented high rates of under-development. For instance, the most developed Greek region, Attica, which hadn’t experienced before high rates of

unemployment, now it is in the same class with regions that had traditionally high rates of unemployment.

The goal of this paper is to examine the extent to which each region has been hit by the economic crisis –because each of them has been affected to different degree- using certain indicators which are presented minutely in the research. We do not focus our attention on some specific regions; instead of this we examine all regions whether they are developed or under-developed. Moreover, throughout this research we also pursue to investigate the regional disparities which induce to the differential impact of the crisis and which worsened due to the austerity measures that were applied. Regional disparities reflect permanent structural or macroeconomic imbalances in the production model of the country and the causes of their existence are geographical and environmental factors, the regions' social structure, the low mobility of labor and capital, institutional and political factors and external economies. Furthermore, this paper investigates the degree of resilience of each region during the crisis i.e. whether they can cope with it, overcome it and recover from it. In order to ascertain it we will examine if regions dispose resourcefulness, performance, redundancy, diversity, innovative learning, connectedness, robustness and rapidity. Finally, we will valuate the regional resilience and we will examine whether it is resistance, recovery, re-orientation or renewal (or resumption).

**Key words:** economic crisis, Greece, regional disparities, regional resilience.

General Theme: W

## **Introduction**

The economic crisis of 2007 has affected all European countries and some, such as Greece in a more extend degree. The impact of the crisis varies from region to region, as well as the ways of dealing with it. The basic causes of unequal impact of the crisis is the regional disparities that distinguish the Greek regions and the homogeneity of the austerity measures implemented in Greece without taking into account the diversity of those regions.

The aim of the present study is to examine the extent to which each region of Greece was influenced and continues to be affected by the economic crisis. For this reason, certain indicators will be used for the years 2009 and 2011. Those indicators include GDP, employment, unemployment, education level, population change, etc and can reveal any disparities among regions as well as the degree of their resistance to the crisis.

The first part of this work has the theoretical background, where the concepts of regional disparities, regional resilience and economic crisis in relation to the regions are displayed. In the second part the indicators are presented, allowing us to compare regions.

## **Theoretical Background**

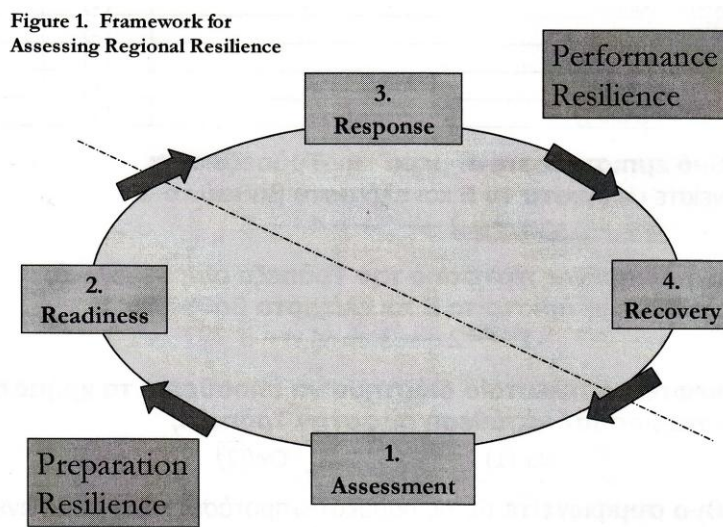
### ***Regional Inequalities and Resilience***

The problem of unequal distribution of income, economic opportunities and activities in the regions is an issue of major concern for every country. Inequalities within countries-whether developed or developing-that at regional level concerning the economic development and well-being are much more pronounced compared to those developed between countries (Taylor and Bradley, 1997; Ertur and Le Gallo, 2003).

Regarding Greece, regional disparities intensified during the first three post-war decades and according to research done this phenomenon is constantly evolving due to the geographical features of regions, changes in the productive structure, spatial policies and applicable international economic environment that has been created (Petraikos and

Saratsis; 2000). Greece shows significant regional disparities in interregional and intraregional level, as there is a large development gap between regions in the country and the EU average, particularly in terms of competitiveness. The regional policy in Greece is intended to address both aspects of the problem, but focuses more on a national rather than regional development program.

Regional resilience is defined as the ability of a region to prevent, prepare, respond and 'recover' after a disturbance so as not to stand this obstacle to its development (Foster,2006; Hill et al, 2008) (Figure 1). According to this figure, the process of resistance is divided into two parts: the preparation for durability and its application.



*Source: Foster, 2006*

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).

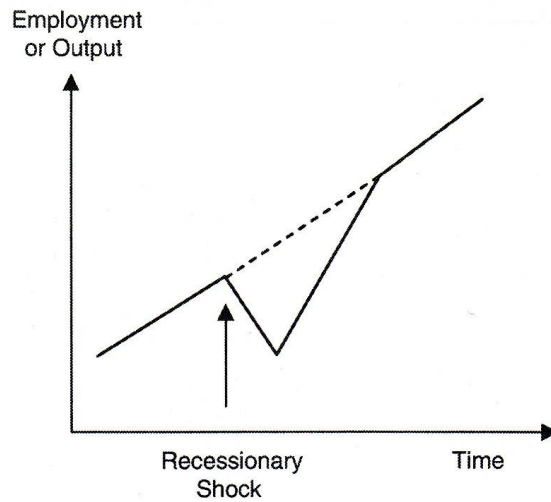
According to various researchers each region should exhibit certain characteristics in order to be considered resilient (Bruneau et al., 2003; Foster, 2006; Martin and Sunley, 2007; Bristow, 2010; Longstaff et al., 2010). These characteristics are resourcefulness, performance, redundancy, diversity, 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 does not necessarily mean that a region should return to the same development path (Briguglio et al., 2006; Christopherson et al., 2010). 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 he has the skills to self-corrected it back to its original state (equilibrium).

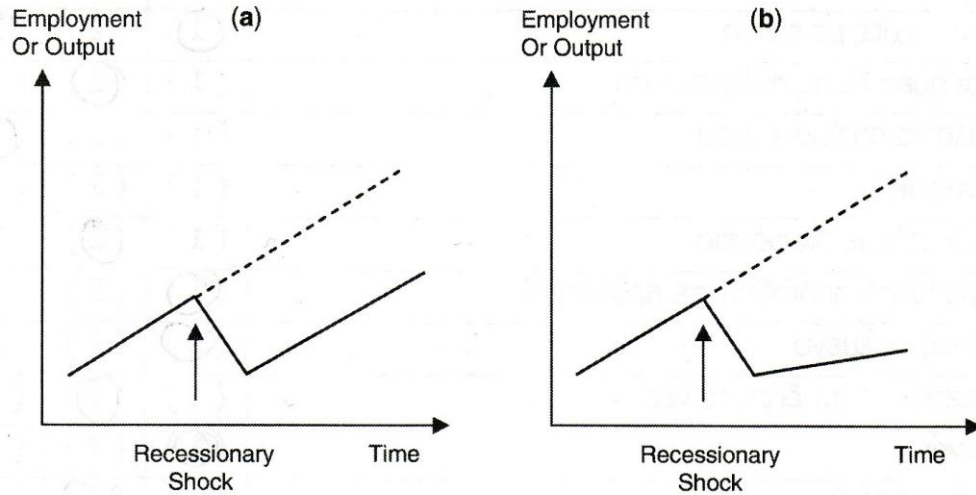
**Figure 2 Engineering Resilience**



*Source: Martin, 2012*

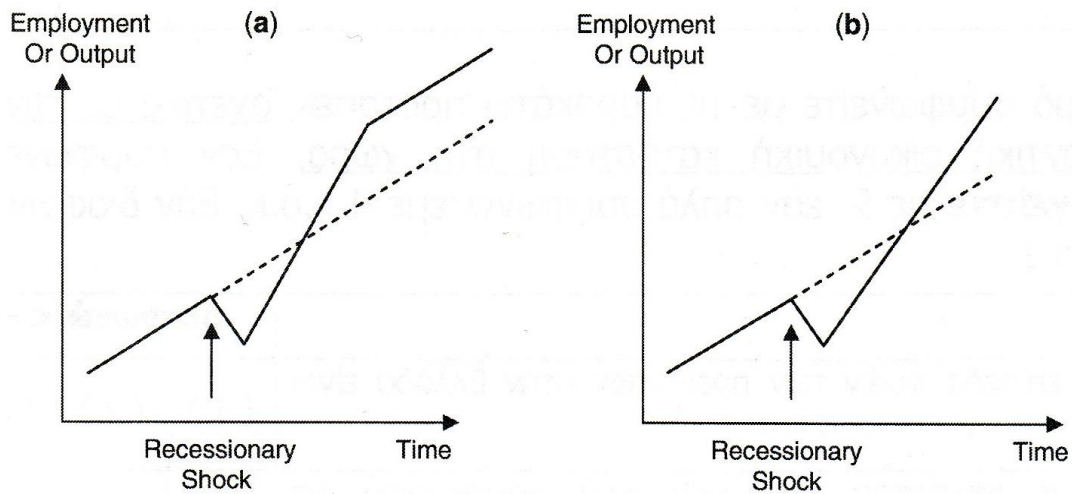
Another form of resilience is the ecological resilience. According to Hill et al. (2008) this type of resilience gives an opportunity for the region not to follow a path, which is not very efficient. On the contrary, it allows the region to choose that point that gives the optimal economic performance. However, it can happen and the opposite. 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. The following figure 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*

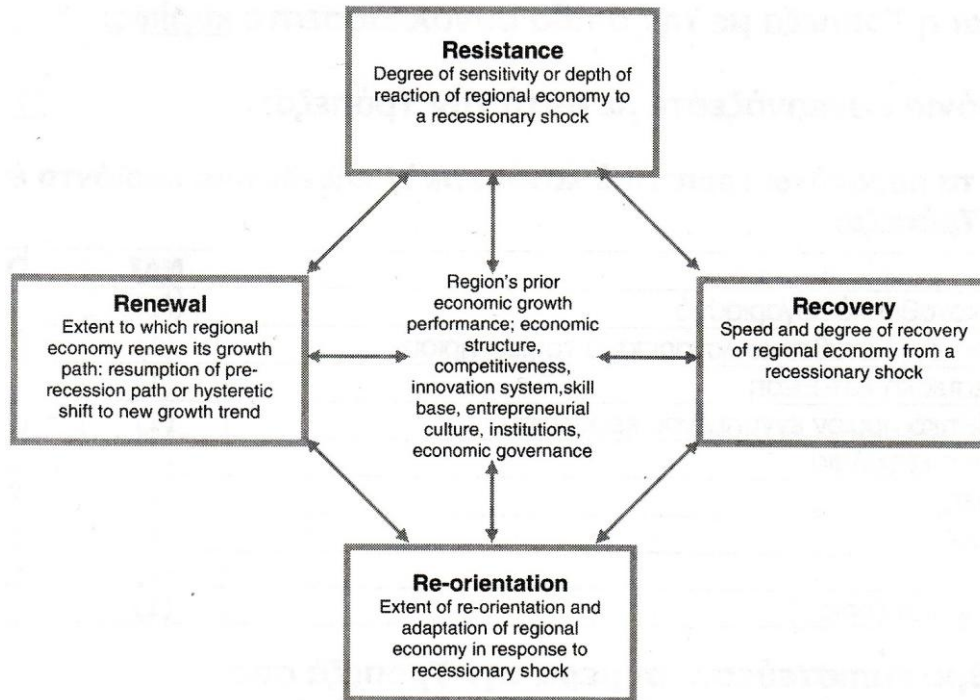
Finally, another form of resilience is the adaptive resilience (Carpenter et al., 2005). A region's probability to deal with various shocks depends largely on its ability to adapt to variable conditions of the environment. This explanation is given in the framework of the theory of complex adaptation. 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.

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 5).

**Figure 5: A region's responses**



*Source: Martin, 2012*

Summarizing, the regions according to the resilience they have after a disorder are classified in the following three categories (Briguglio et al., 2006; Hill et al., 2008). Initially, there are 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. These regions are called economically resilient. Another category of regions are those that withstand such riots and did not "escape" from their course because of these. These regions are called shock-resistant. Finally, there are regions that can not meet these

disorders because they can not return to their original state and are classified as non-persistent. These regions are called non-resilient.

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). Some of 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 (Christopherson, 2010).

### *Spatial effects of crisis*

The impact of the economic crisis in each region depends on two factors. These are:

- the stage they are in business circles ie whether they are in a growth stage or recession. In the development stage, regional disparities are accentuated (spatial concentration) because the positive elements of the regions emerge through the accumulation and eventually also differences between regions. On the other hand, in the recession stage regional disparities are blunted (spatial dispersion) for the opposite reason (Psycharis et al.).
- the degree and type of specialization of regions. Market liberalization has allowed regions to specialize enhancing competitive advantages. Excessive specialization, however, threatens to grow even further any regional disparities and make regions more dissimilar in their production structure.

Greece is dealing with an economic crisis that affects the productive base and income level of its residents. Due to the austerity measures imposed on Greece by the lenders (the IMF and E.U) all the attention was given to the country inevitably and not in each region separately. However, the effects of the crisis at the regional level are so intense that they can't be ignored. Initially, the conditions that prevailed before the crisis (market size, geology, accessibility, natural resources, etc.) differed considerably among the Greek regions. Then, the austerity measures implemented were the same for all regions without taking into account these inequalities. Consequently, the impact of these measures differs from region to region. Hence the uneven impact of crisis is primarily the result of the homogeneity of the austerity measures implemented in the regions without taking into account the inequalities that characterize them

These measures imposed on Greece, as in other European countries, were geographically horizontal which means that they were the same for all regions and did not consider the inequalities such as income, financial resources, specialization, etc. This practice, however, resulted in the uneven impact of the crisis on Greek regions which is characterized by multifaceted regional disparities. This can be noticed by the fact that

40% of Greece's population and 50% of GDP is concentrated in Attica. In addition, the bulk of industrial activity has been concentrated in Attica, while the remaining regions are mainly based on tourism, agriculture and light industry.

Such tactics, of course, will inevitably lead to economic decrease in less developed regions. In addition, businesses that act in the best interests will reduce their investments in regions characterized by low demand, weak physical connection, lack of variety of labor and poor infrastructure and will move to metropolitan areas and especially in the capital.

Moreover, from the perspective of workers, the situation is almost similar. Specifically, because of the high unemployment, a large amount of workers who have the appropriate skills, move to large urban centers where there are more jobs. Therefore, the economic activity is concentrated in major urban centers and regions are the most affected by unemployment.

The above analysis shows that this is a cyclical process. This means the less successful regions will weaken more in a short period of time thereby perpetuating regional inequalities. According to various surveys (Ciccone and Hall, 1996; Angeriz et al., 2008) the reduction of economic activities in disadvantaged regions, undoubtedly leads to poorly productive development. A low level of productivity growth will in turn lead to a reduction in the region's economic efficiency, wages and profits. Consequently, migration and repulsion for investment is growing, leading to the conclusion that the disparities growing between developed and non-developed regions persist, even if the initial conditions that caused them disappear (Monastiriotes, 2011).

## **The Case of Greece**

This paper focuses on regional disparities that distinguish the Greek regions and examines the degree of resistance these regions have during the crisis. Specifically, the aim of this study is to examine the extent to which each region was affected by the economic crisis using some indicators.

Moreover, we will focus on the identification of regional disparities, which contribute to the differential effect of financial crisis-particularly the austerity measures has brought-in each region and finally look the degree of resistance these regions have.

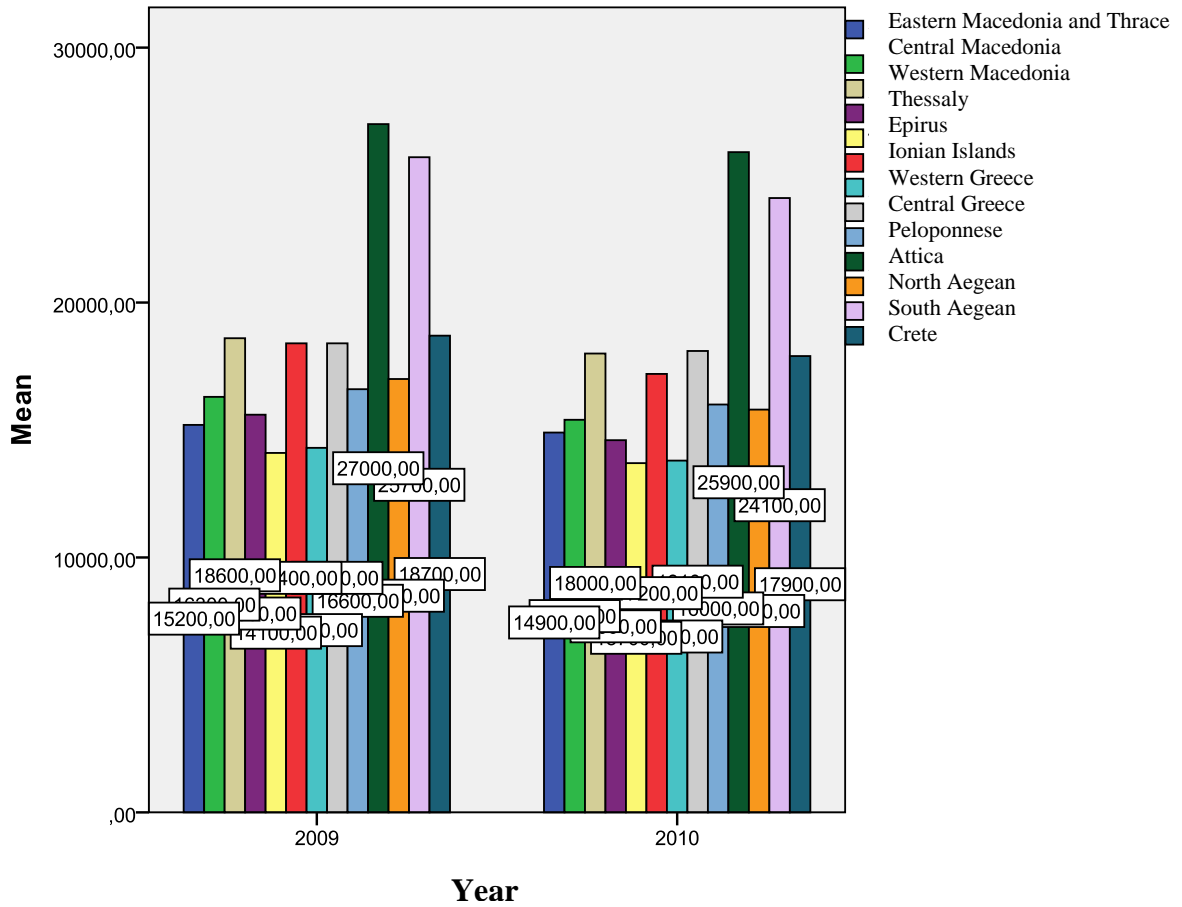
Since the economic crisis began in 2007 and is still ongoing in the context of this research we will focus on two of the three characteristics of regional resistance ie the ability of a region to withstand external pressures and the ability to respond positively to these changes. As expected, we can not mention adaptability because regions have not overcome the crisis and therefore we can't say if they have learned to operate in a different environment. Finally, we will examine the disparities in the regions of Greece, their resilience to the economic crisis and we will investigate its extent and the reason why this is different from region to region.

## **Methodology and findings**

To examine whether the Greek regions affected by the economic crisis and in order to see which are resilient certain indicators are used. These indicators cover various fields, such as the economy (GDP), education (Number of students, schools), employment (number of workers, unemployment) as well as demographic ones (births, deaths, population, infant mortality).

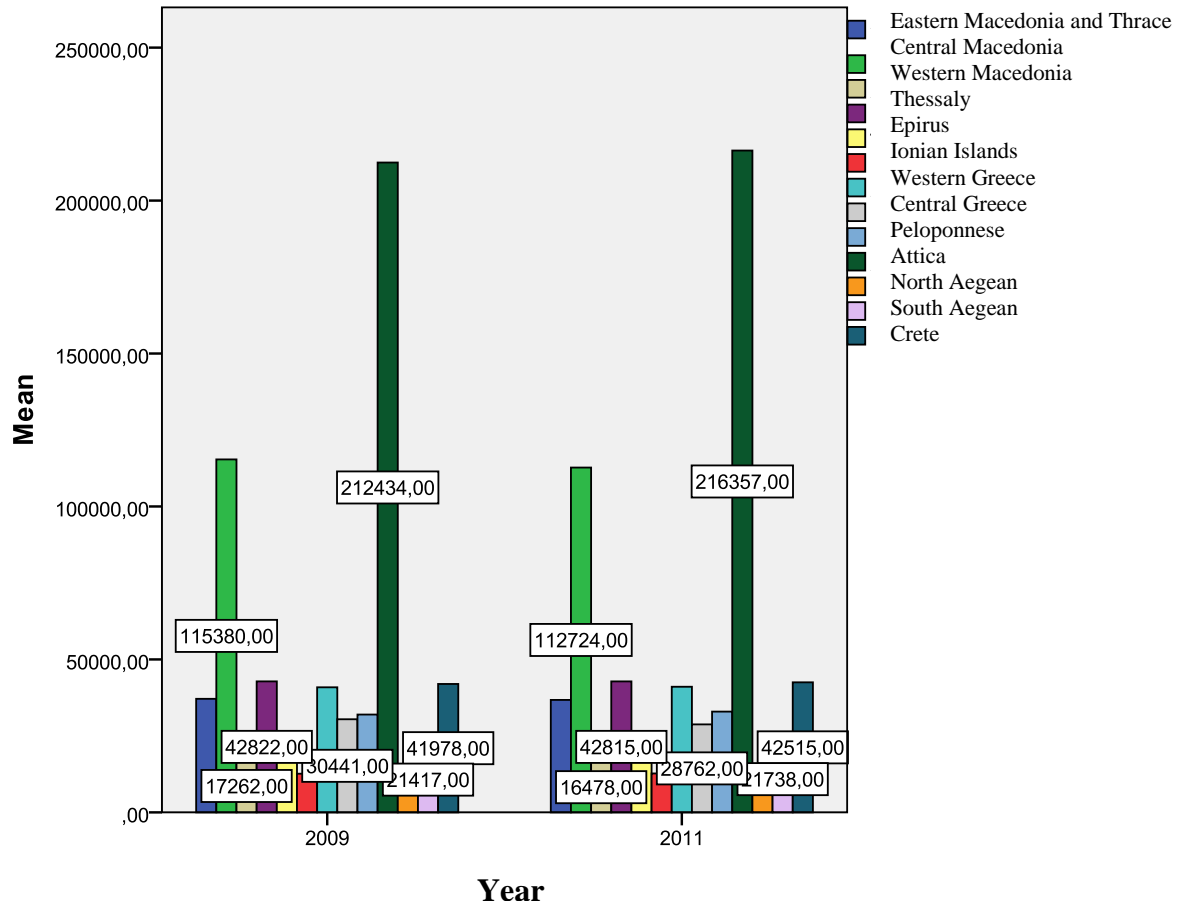
Diagrams and tables are used to present the data collected and statistical analysis was used to examine if the theory presented applies to Greek regions.

Data refer to years 2009 (beginning of crisis) and 2011 and are collected from Eurostat and Hellenic Statistical Authority for the case of educational data.



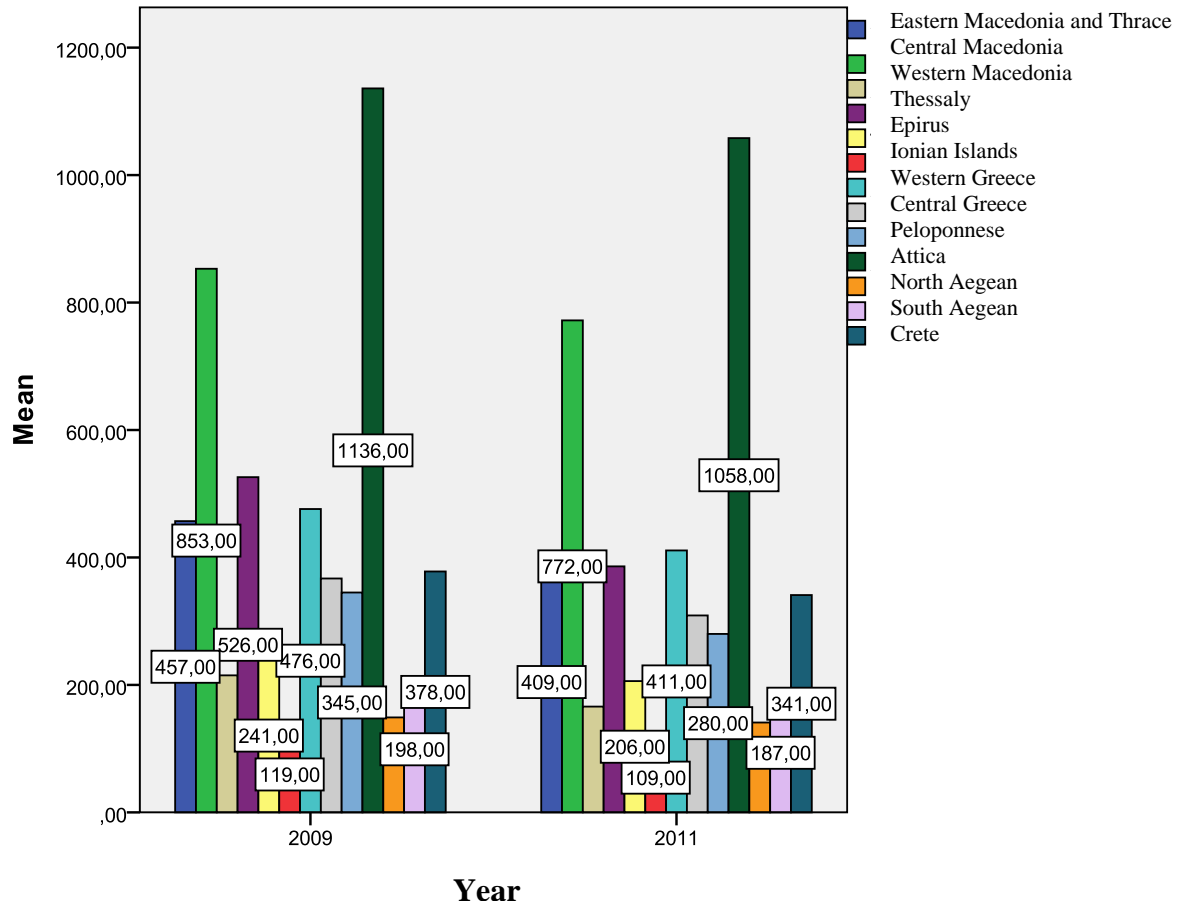
**Figure 6: GDP per region in 2009 and 2010**

According to Figure 6 Attica is the region which has the highest GDP both before and during the crisis. This is due to the fact that the majority of economic and productive activities are concentrated in this region. South Aegean, Crete and Western Macedonia are following. In addition, the Ionian Islands have one of highest positions. We can see that most regions that have high values of GDP are islands.



**Figure 7: The number of students in primary schools per region in 2009 and 2011**

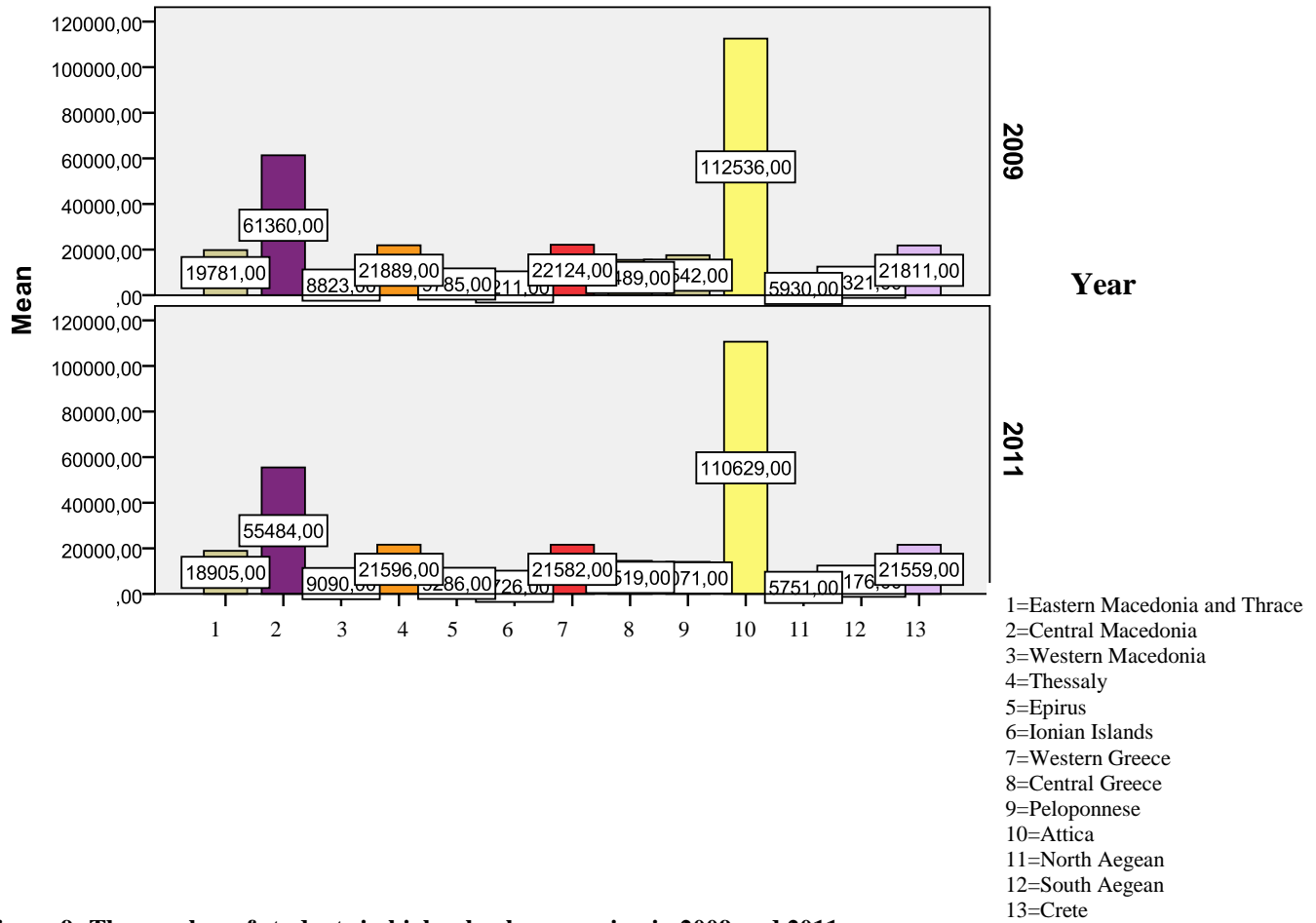
The above chart shows the number of pupils in primary education at the beginning of the crisis (2009) and 2011. We notice that there aren't any significant changes in the number of students. This is an encouraging sign of the level of illiteracy in Greece. However, we should not overlook the fact that in Greece until the 15th year, education is compulsory. Moreover, we can notice that only in the Attica region there is an increase of students. This is probably due to the entry of migrants and their families in our country mainly in Athens.



**Figure 8: The number of primary schools per region in 2009 and 2011**

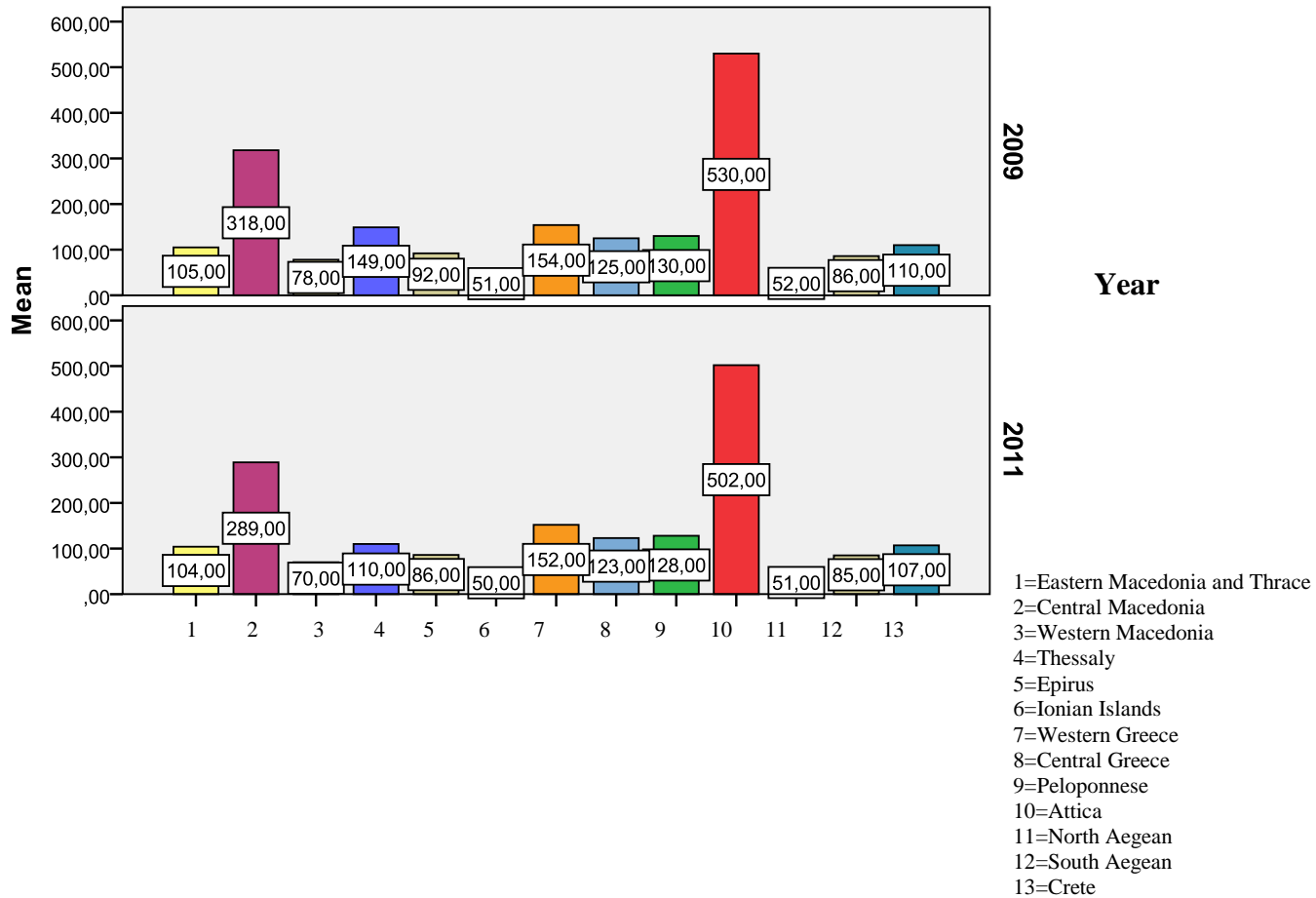
Figure 8 shows the variation in the number of schools in 2009 and 2011. We notice that in all regions the number of primary schools has declined and is expected to be further reduced with the new decisions concerning the merging of school units. This is perfectly logical if we consider mergers that occurred in the 2011-2012 school year in order to save money for the state.





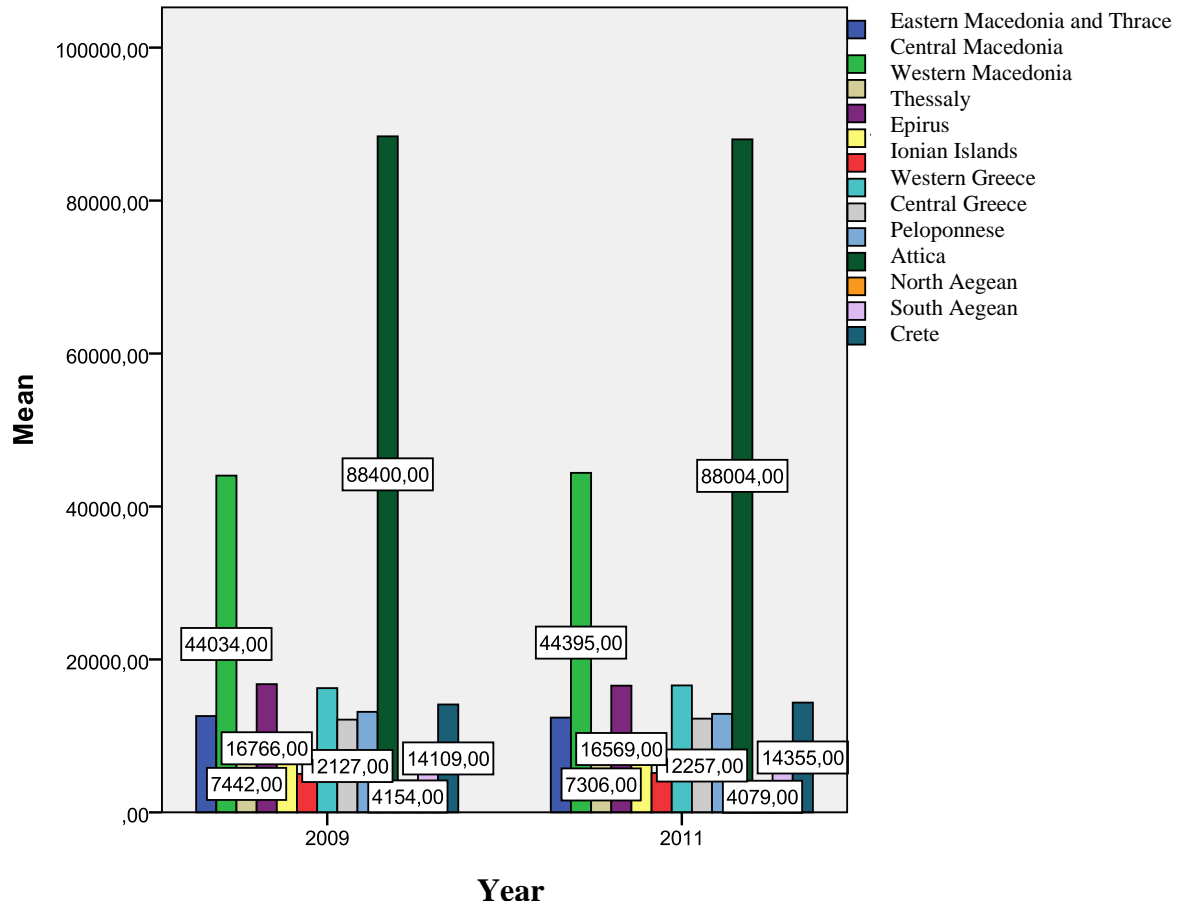
**Figure 9: The number of students in high schools per region in 2009 and 2011**

As shown above, the number of students attending high schools has dropped considerably. Although attendance is compulsory in high schools, we observe that many have left and therefore the educational level falls.



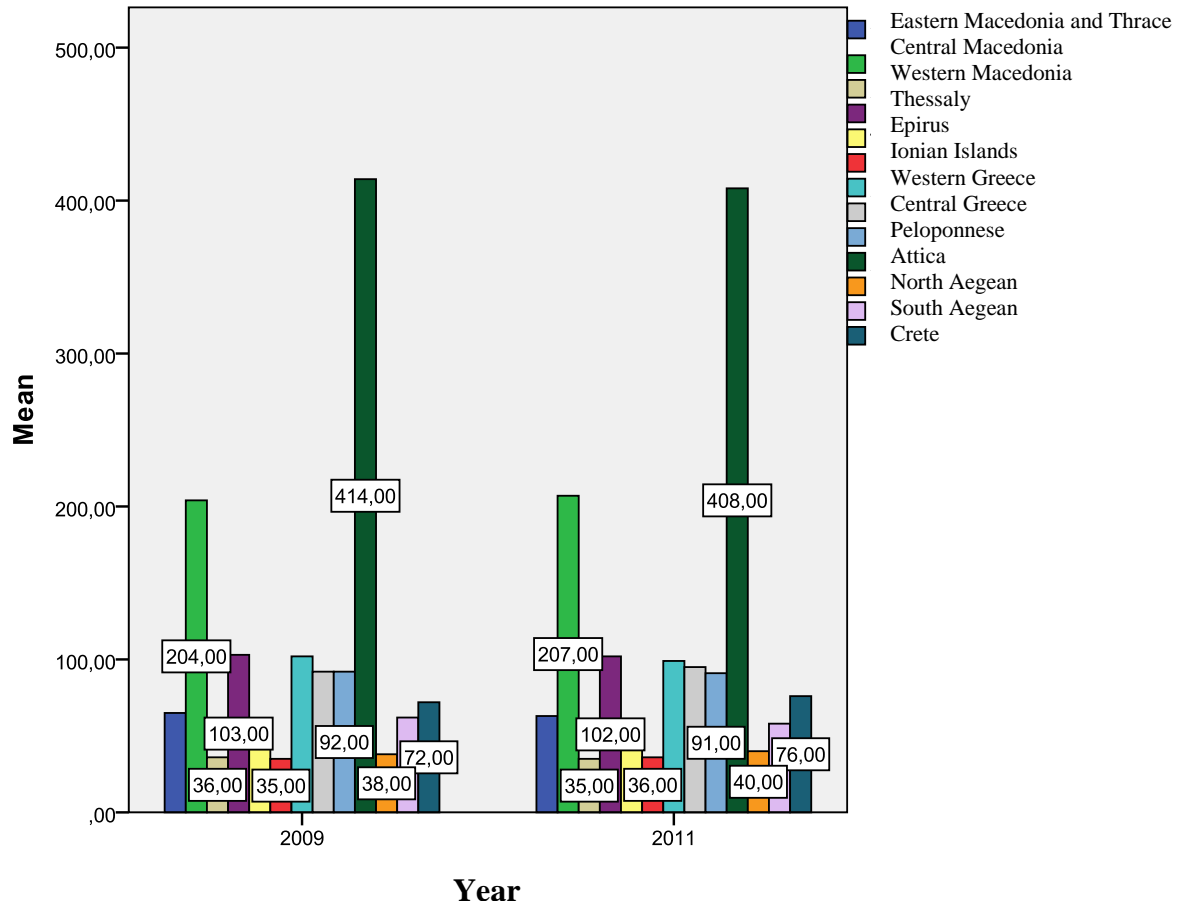
**Figure 10: The number of high schools per region in 2009 and 2011**

Figure 10 shows the changes in the number of high schools. In all regions there has been a reduction in school units, which is due to the mergers that took place in secondary education.



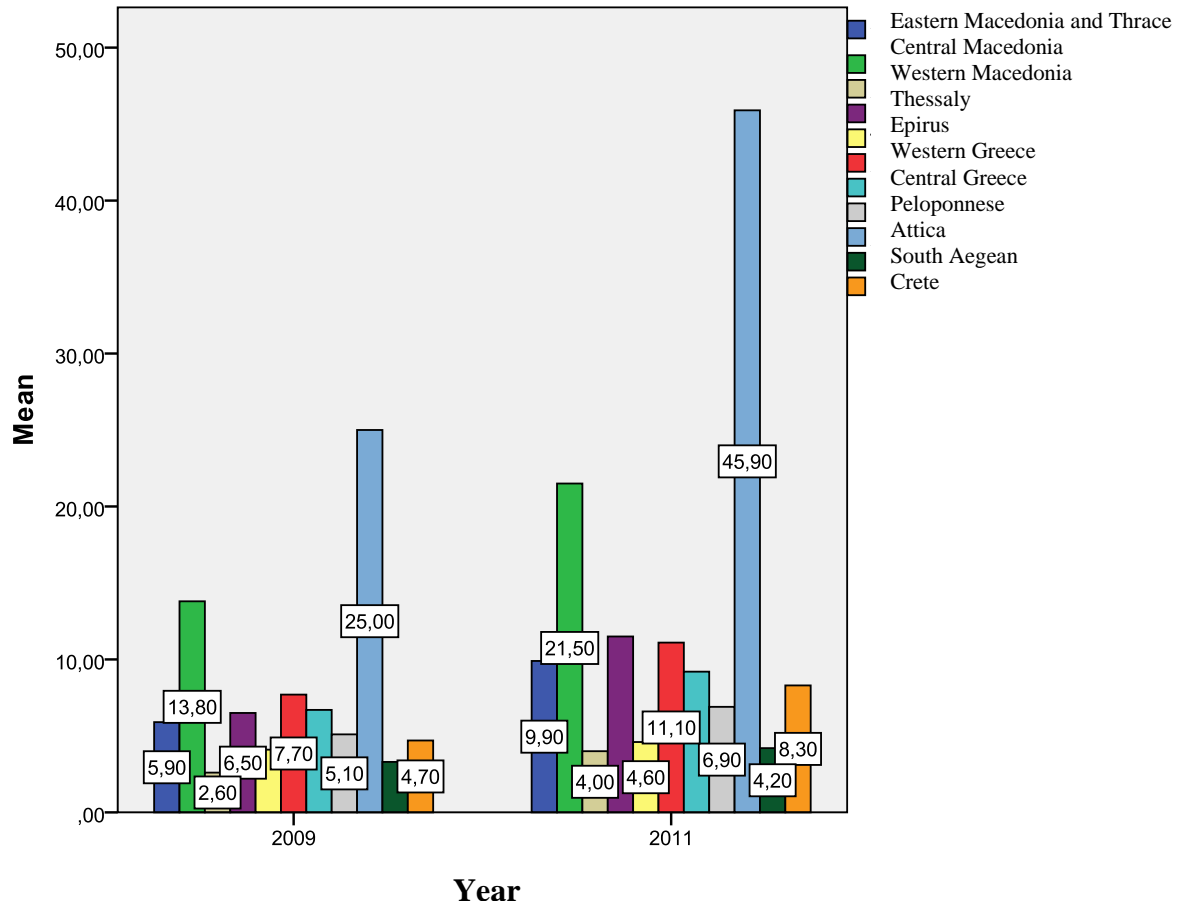
**Figure 11: The number of students in lyceum schools per region in 2009 and 2011**

The number of students attending school is quite different compared to that for the students who are in high school (see Figure 9) Lyceum school students are much less than those of high school in both 2009 and 2011. This is due to the fact that education is compulsory until the 15th year, so after that some still and some others are turning to the labor market.



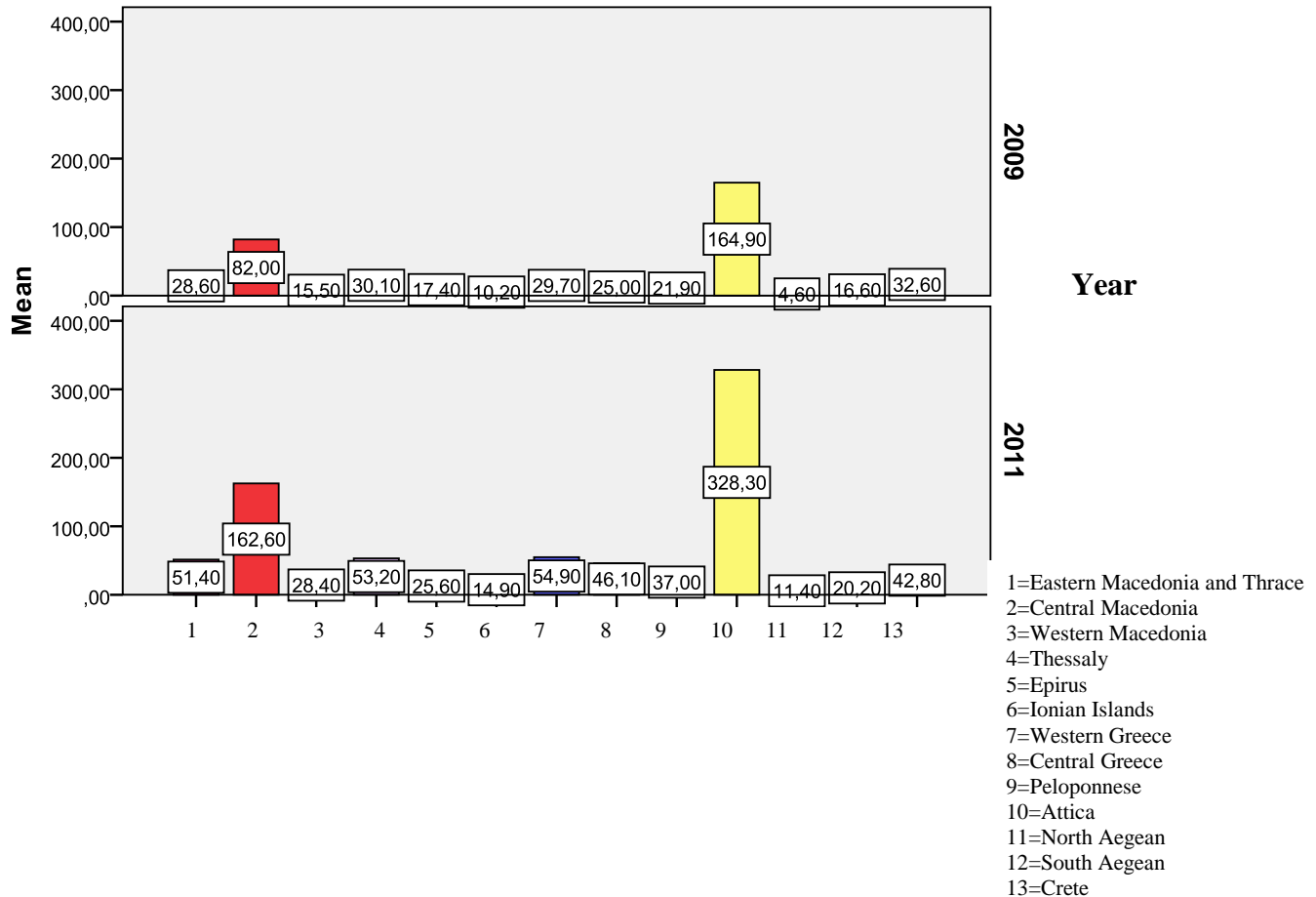
**Figure 12: The number of lyceum schools per region in 2009 and 2011**

The above figure shows that the number of secondary schools has changed from 2009 to 2011. In only a few regions, the number of secondary schools has increased.



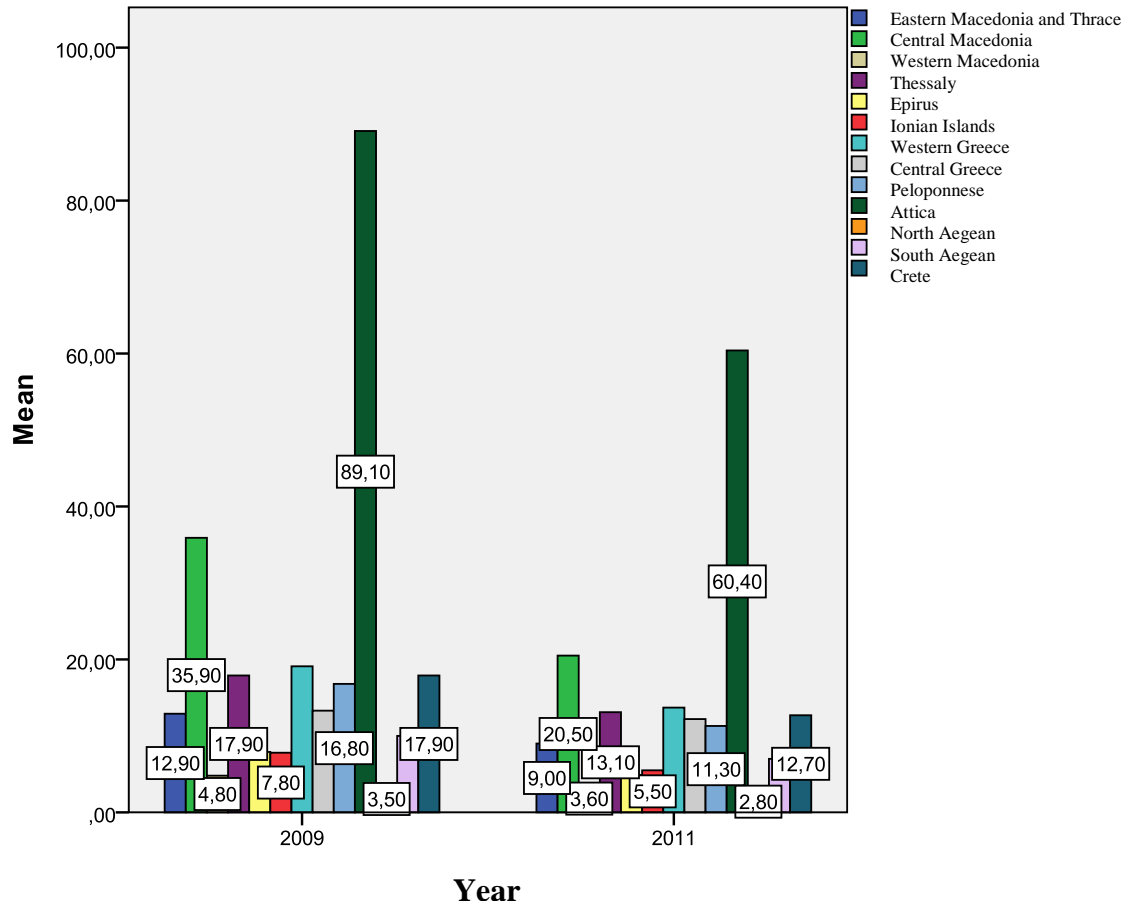
**Figure 13: The unemployment rate for people 15-24 years per region in 2009 and 2011**

Figure 13 shows the number of youth unemployed in thousands for the years 2009 and 2011. We observe that in all regions unemployment has increased to a large extent, with the greatest increase occurring in Attica because of the fact that there are more young people gathered in the attempt to find work in large urban centers. Unfortunately, data on the islands of the Ionian and Aegean were not available, but looking at the change in other regions, as well as the diagram below, we can assume that in island regions unemployment was high.



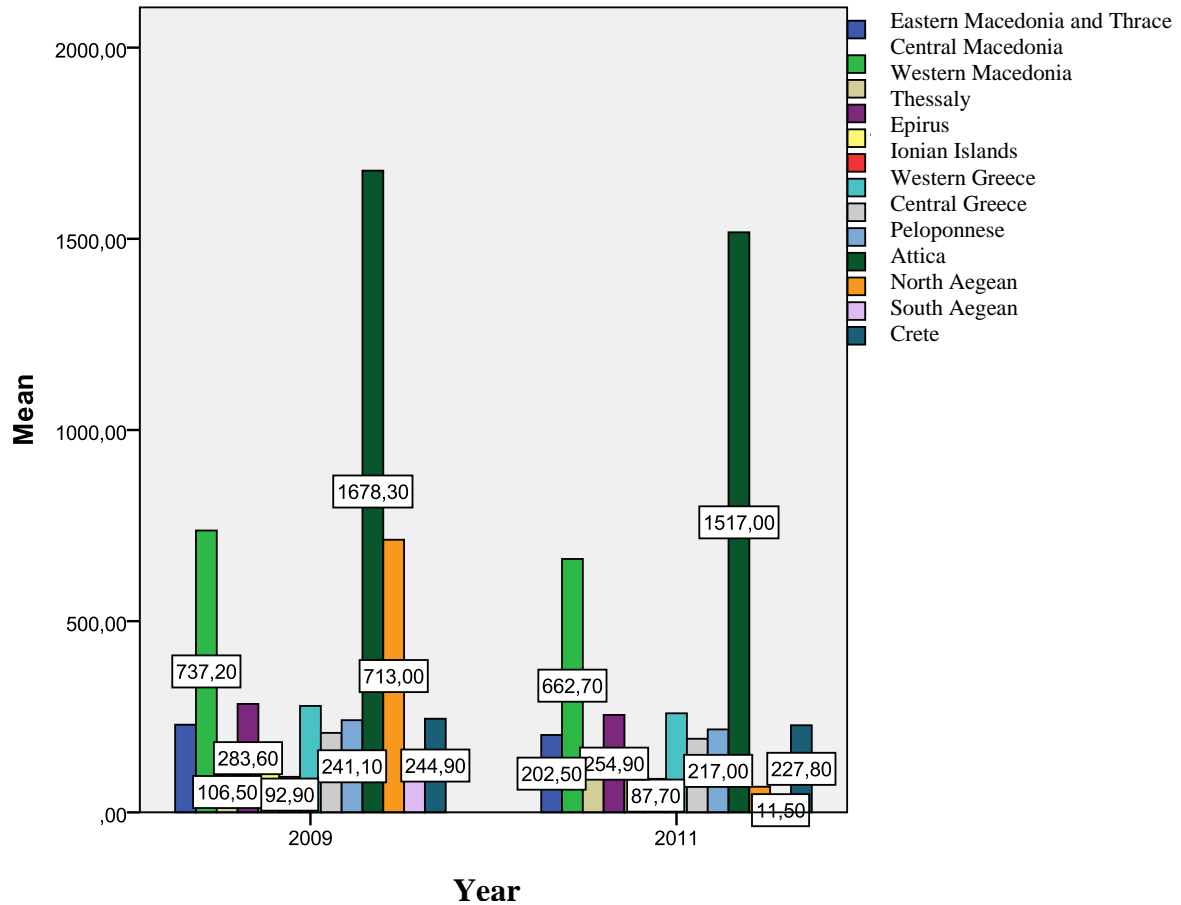
**Figure 14: The unemployment rate for people 15 years and over per region in 2009 and 2011**

The above figure shows the number of unemployed persons (all ages, in thousands) in 2009 and 2011. In particular, it appears that the highest unemployment rate is in Athens and then in Central Macedonia. It is noteworthy that there are more unemployed people in the regions where the two largest cities, Athens and Thessaloniki are. This finding confirms the research already done (Monastiriotes, 2011). Specifically, we reported previously that because of high unemployment much of the workforce, who has the appropriate skills, moves in large urban centers where there are more jobs. However, since jobs are limited because of the crisis, the unemployed rose in these areas almost 100%.



**Figure 15: The employment rate for people 15-24 years per region in 2009 and 2011**

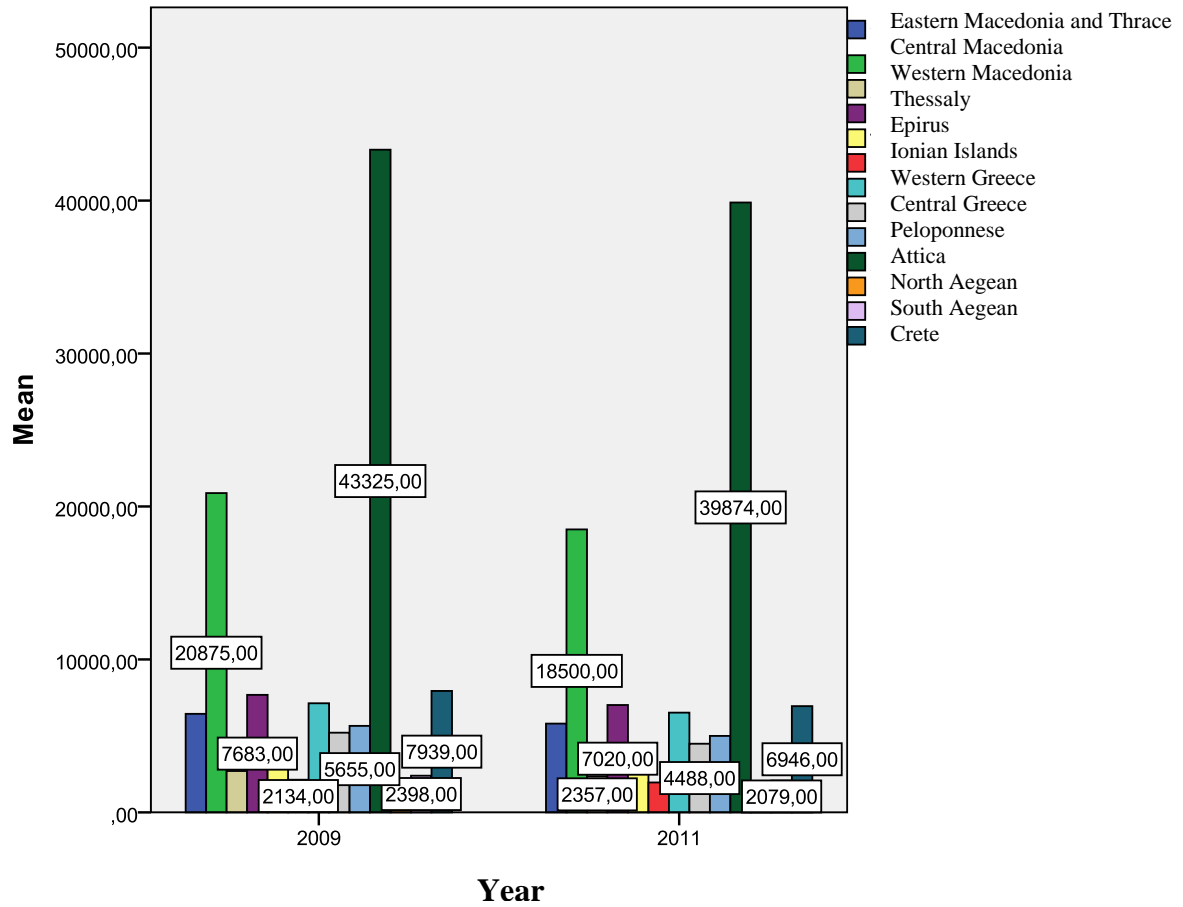
Figure 15 shows the number of young people in thousands of working at regions level. As in Figure 3.10, previous studies (Monastiriotis, 2011) are confirmed, showing that most of the active workforce is concentrated in major urban centers (Central Macedonia and Attica). It seems, however, that the measures imposed limited the economic activity and therefore jobs decreased.



**Figure 16: The employment rate for people 15-64 years per region in 2009 and 2011**

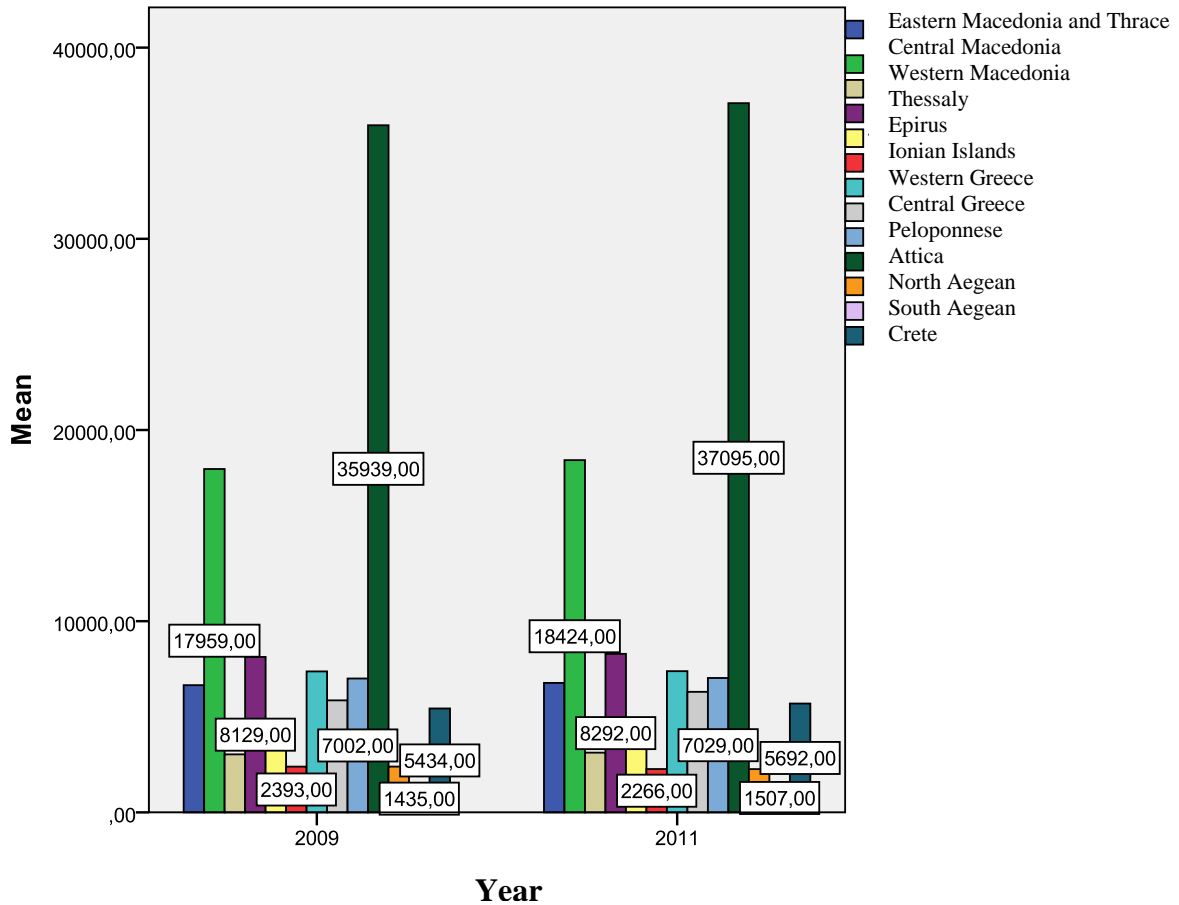
Figure 16 shows the number of people employed in both 2009 and 2011 in every region. Comments are similar to the previous diagram namely that most workers are concentrated in large urban centers. Noteworthy, however, is this: before the crisis a very large part of more 'mature' workers employed in positions in the North Aegean. Over the years, however, with the emergence of the crisis, there was a dramatic decrease in employment of these persons in the Northern Aegean, proving insufficient and inadequate regional policy.





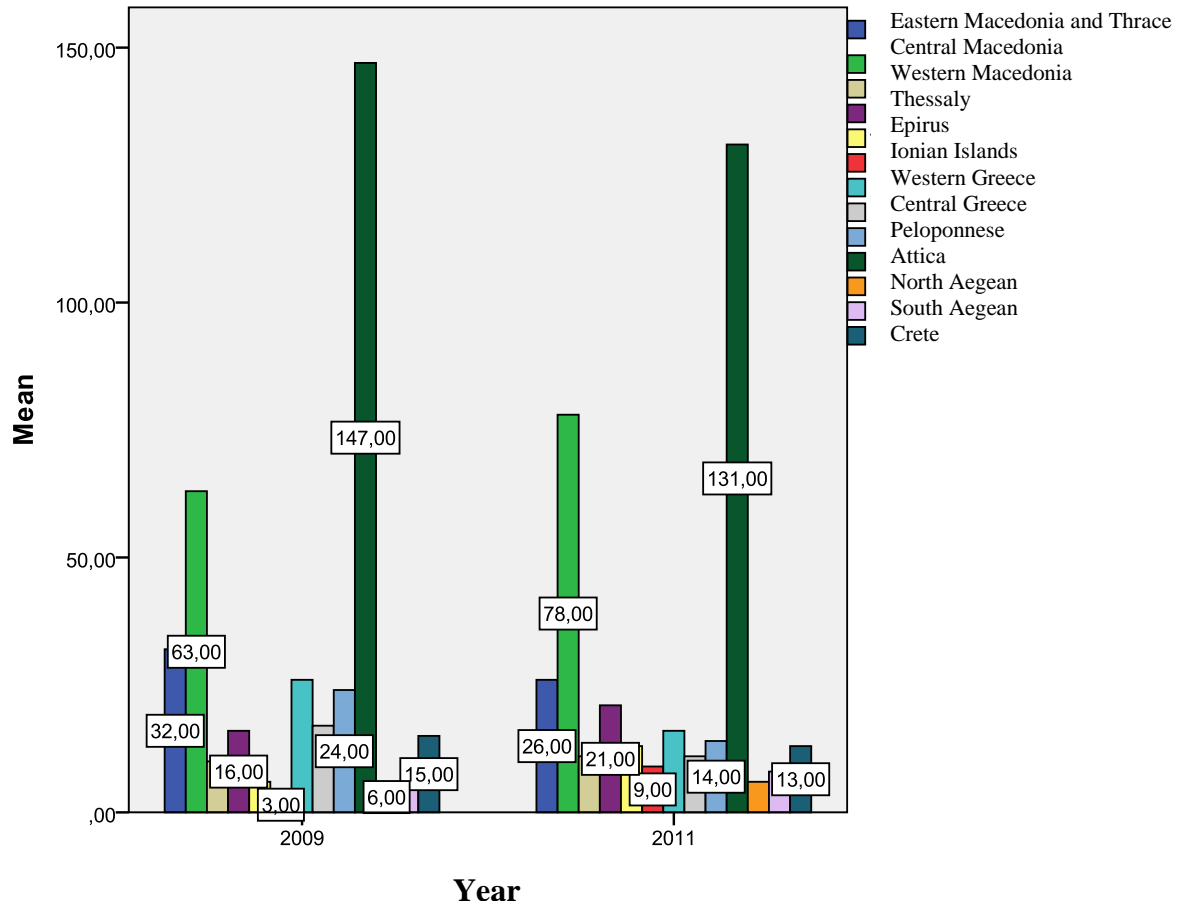
**Figure 17: The births' change per region in 2009 and 2011**

Based on Figure 17 we see that there has been a reduction in the number of births. We observe that the biggest birth rate is in the regions of Attica and Central Macedonia. It is no coincidence this finding because these regions have most of the population of Greece.



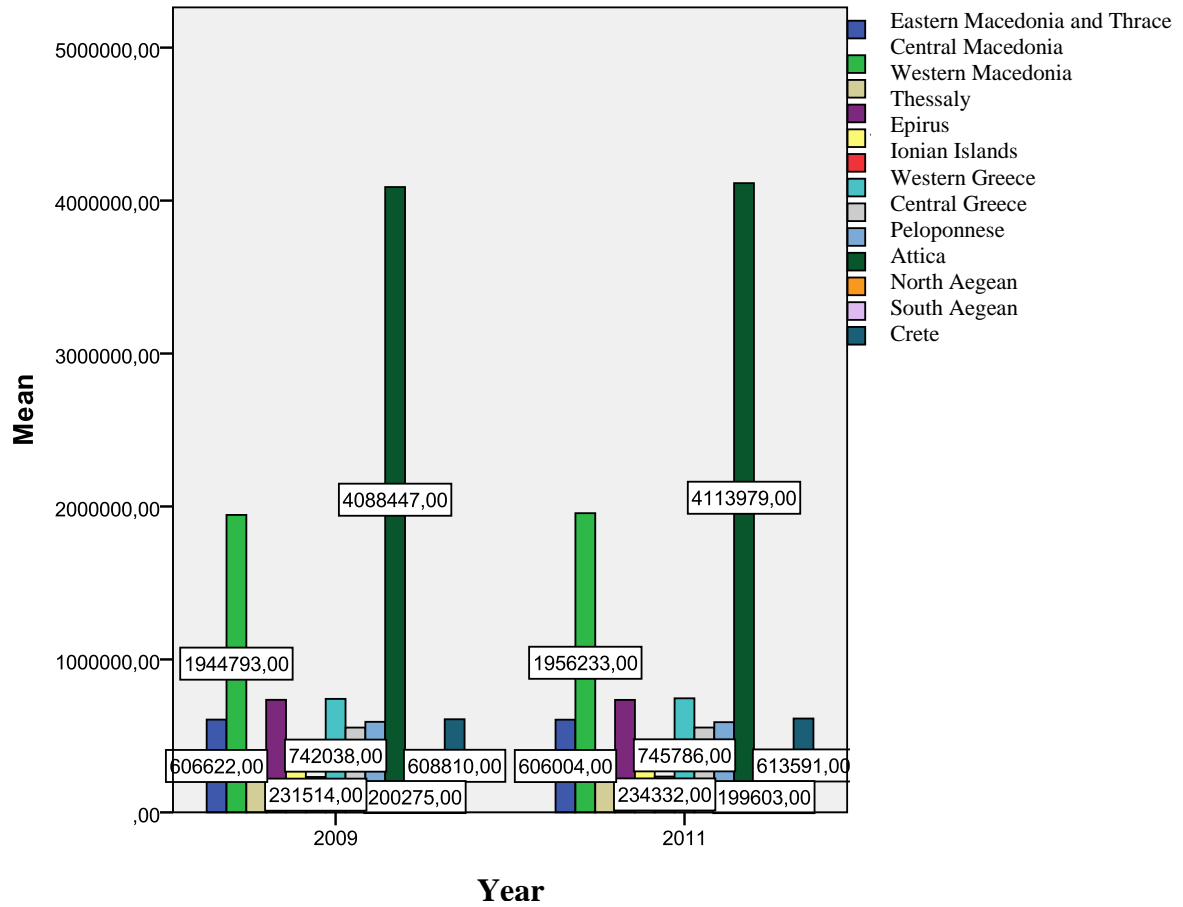
**Figure 18: The deaths' change per region in 2009 and 2011**

Figure 18 shows the increase in deaths from 2009 to 2011. We observe that the mean percentage of deaths has increased, although it should be the opposite because of the improvement of science in the are of diseases, drugs etc.. Of course, we must not ignore two unpleasant facts, which are directly related to the crisis. The first is that of suicide. Since the beginning of the crisis until today suicides have increased and this is due to the unfavorable economic situation of people and burdensome measures imposed on them. The second issue concerns the cuts suffered by the health sector. Less and less money available to care resulting in thousands of people not have the ability to have the basic health care.



**Figure 19: The levels of infant mortality per region in 2009 and 2011**

Figure 19 records the levels of infant mortality in 2009 and 2011. We observe that in almost all regions (with few exceptions) these levels have fallen. This is an indication of the improvement of scientific instruments and medicine, which is not hindered by the adverse conditions of economic crisis..



**Figure 20: The population per region in 2009 and 2011**

In the last figure we see the change that has occurred in the population from 2009 to 2011. We observe that the population has increased in all regions, but not very much as expected due to the increase of immigrants. At this point we can speculate that the population has not increased because of the fact that many Greeks have moved abroad to seek new business opportunities because of the crisis.

**Table 1: Regional inequalities in Greece**

Indicators	2009	2011
GDP*	0,22	
Number of students at primary schools	1,15	1,16
Number of primary schools	0,69	0,73
Students at high schools	1,15	1,17
Number of high schools	0,87	0,87
Number of students at lyceum schools	1,21	1,20
Number of lyceum schools	0,97	0,98
Unemployment rate for people 15 years and over	1,18	1,29
Unemployment rate for people 15-24 years	0,97	0,86
Employment rate for people 15-64 years	1,28	1,27
Employment rate for people 15-24 years	1,13	1,10
Births	1,28	1,30
Deaths	1,13	1,14
Infant Mortality	1,37	1,32
Population	1,23	1,23

\*GDP in 2010 was 0,21

Table 3.1 shows the regional disparities in Greece regarding the investigated indicators. In particular, we have calculated ever index in each region in 2009 and 2011 (or 2010 for the GDP), and we find the coefficient of variation for each of them. We used the coefficient of variation as it is an indicator independent of units of measurement so that the resulting values can be compared from one year to another.

Looking at the values resulting we can notice that regional disparities declined in only five indicators:

- GDP
- unemployment in people aged 15 to 24 years
- the employment of people aged 15 to 64 years

- the employment of people aged 15 to 24 years
- infant mortality.

In contrast, we notice increasing regional disparities on the following indicators:

- the number of students in elementary, middle and high schools
- the number of primary and secondary schools
- unemployment in people 15 years and over
- births
- deaths.

Regarding the number of high schools and population we notice that there has been no change. Therefore, the findings confirm the two theories saying that for some indicators regional disparities are increasing in recessions (Dunford, 1993), while for others they rise during development (Psycharis et al).

## Conclusions

Having analyzed the theoretical framework and applying it in the case of Greece, we are able to make some conclusions, which will answer our original questions.

Our initial goal was to examine the degree of the impact of the economic crisis in each region. Using 15 indicators related to the economy, education, employment, unemployment and certain demographic characteristics we identify the changes suffered by each region due to the economic crisis. We observe that all regions showed a negative trend since the beginning of the crisis to 2011. In particular, the regions in which major urban centers are, i.e. the region of Attica and Central Macedonia show the biggest change-negative-than other regions. Also, non-island regions and particularly those that are industrial centers have been hardest hit by the effects of the economic crisis. Finally, although insular regions show much change in GDP among other indicators the change is more balanced demonstrating and confirming previous studies, which reported that the regions that rely on tourism will suffer less from an economic crisis. This is due to the fact that the economy is not dependent on the public sector, who suffered cuts, but neither are from industries, which moved in large urban centers.

Second, we examined the regional disparities of Greece in the interval 2009-2011 using changes to the indicators and in particular the coefficient of variation. We observed that the inequalities between regions vary from index to an index and based on some indicators of regional disparities worsened, while according to others it decreased. This finding confirms previous studies (Psycharis et al; Dunford, 1993), which conclude that in times of recession regional disparities narrow and that in periods of growth the increase again.

Finally, in the present study we focused on the degree of resistance that characterizes each region. We must emphasize at this point that since the financial crisis is still ongoing, we focused on two of the three characteristics of regional resistance ie the ability of a region to withstand external pressures and the ability to respond positively to

these changes. As expected, we can not mention adaptability because even regions have not overcome the crisis and therefore we can say that through all this they learned to operate in a different environment. According to the charts, which have been analyzed and tables we can conclude the following:

- As for the GDP more resilient are the regions of Central Greece and Eastern Macedonia because both showed the smallest change compared with the other regions and, without doing some comparison, the decline suffered were relatively small (-1.63% and -2% respectively) . In contrast, the biggest change was noticed in island regions.
- In education, more resilient seems to be the island regions such as the Ionian Islands, Crete and the South Aegean which not only show the smallest changes in the number of students and schools, but these changes are positive revealing the high level of education they have.
- As for employment, the Greek regions can not say that responded positively to the changes, mainly on youth employment. Comparatively only, we could assume that the Ionian Islands, North and South Aegean is relatively resistant (-5.60% - 6.03% -6.14%, respectively) on the effects of the crisis on employment.
- As for unemployment, as it is logical, the regions of Central Macedonia and Attica have unemployment rates increased at 100%. This is due to the fact that in these regions there was a moving of workforce, in vain as it turned out, since jobs fell sharply. In general, regarding unemployment, the Greek regions were not as resistant as they had not anticipated such a situation and as a result they failed to respond adequately. We can say that now there are some efforts to integrate the unemployed into the labor market. So this is a "delayed" response of regions due to poor and weak regional policy.
- As for demographics, we observe that the population has not changed significantly in the regions. Therefore, we could say that the Greek regions are resistant to the changes. However, these changes are mainly from the internal movement or from immigration. Not the result of new births, which declined due to the crisis (mainly in Western Macedonia, Central Greece, South Aegean and



Crete) and thus were resistant regions in this respect, nor the reduction of deaths since they remained at same level.

Finally, some suggestions for further research include the extension of this research for the year 2013, in order to identify the impact of the crisis at a time when the recession is widespread. This would give the opportunity for a comparison in order to see the effect of the crisis in different periods and draw more reliable results on the resilience of regions.

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