

## GREEK ECONOMIC CRISIS ON MACROECONOMIC INDICATORS

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**Abstract.** *This paper aims to examine briefly some elements of macroeconomic aspects that could explain - at least partly - a number of causes of the current economic crisis in Greece. Using data provided by competent bodies, is intended as a more accurate outlining the differences between Greece and the other countries of the European Union member show widespread Greek State as an outlier among the countries that make up the current "U.E. 28 ". The analysis is based on three indicators relevant to the case – unemployment, government debt and nonperforming loans.*

**Key words:** *public debt, GDP, budget deficit, unemployed, nonperforming loans*

**JEL:** G01

### 1. Introduction

One reason for concern for many states was considered public debt. This problem became acute in the early 80s, when the outbreak occurred chain debt crisis in several countries. This was manifested by the cessation of foreign debt payments. Such problems caused by public debt have come to the attention of both the creditor states and those responsible for payment. In the early 1980s foreign debt crisis was manifested in several countries particularly indebted countries in Central and South America.

Real estate credit crisis led to global financial crisis, and since then central banks and governments of developed countries made great efforts to unlock credit economy, which gradually came into recession. A retrospective of the world economy reveals that there were crises in other countries such as Brazil and Mexico, but they were due to wrong government policies based on low taxation and a fixed rate of conversion of national currencies (**Bătrâncea, Bătrâncea, Moscviciov, 2009**) [1].

The current crisis led to a significant decrease in the confidence level of consumers, investors and businessmen, which in turn affected stability and economic strength. This created a vicious circle of economic growth based on excessive consumption sustained by debts. Deregulation and financial liberalization did not generate an efficient allocation of resources. Recent measures taken by governments numbered assets acquisition, banks recapitalization, injecting liquidity into the banking system. In spite of these measures, many banks have not escaped the subprime lending problem. At least in Europe, counterbalancing the effects of the financial crisis appears to be an extremely difficult mission. France, for example, created a sovereign fund to assist strategic companies (**Bătrâncea, Moscviciov, Sabău, Bătrâncea, 2013**) [2].

Greece has faced a number of issues in economic terms in the last decade and is undoubtedly exacerbated by the financial crisis of the late 2000s - 2010. Greek state debts continued to rise up, reaching a step to be in default. Central spending years in a row exceeded receipts from taxes, which is one of the pillars of current tensions (**Kashyap, 2015**) [3]. Given that Greece's problems were accentuated international lenders Greek government proposed a set of austerity measures designed to redress the difficult situation in which it is found. The proposed plan was greeted with less enthusiasm by Greek jurisdiction, being launched a referendum to consult the population on the intention population (or lack thereof) to adopt austerity measures (**Johnston, 2015**) [4].

The referendum was preceded by a closure of Greek banks in early July 2015 along with a series of regulations imposed on their clients. Also, among other restrictions, withdrawals from automatic were restricted to a maximum of 60 Euros / day and were only allowed the financial transactions between banks in Greece to avoid a removal of capital abroad (**Phipps, 2015**). [5]

Popular vote of 5 July 2015 rejected the recovery plan proposed by the European Union, media globally speculating a Greek exit from the Euro zone (**O'Brien, 2015**) [6]. One embodiment of this would have serious consequences for the Greek region. An immediate effect would be played by the reintroduction of the Greek drachma - the currency used before accession to the Euro area or the launch of a new currency. This may entail various other shortcomings. First, it was the question of uncertainty regarding the ability of the Greek Central Bank to put into circulation a money supply in sufficient time to replace the existing euro herds. Furthermore, a return to the drachma would mark the emergence of a hyperinflation. It was intensively discussed and the high unemployment rate, as a possible cause which led to placing Greece in such a position of economic difficulty (**Bird, 2015**) [7].

This paper aims to make a sneak peek into how they have evolved over the years a number of economic indicators - current problems associated, through a comparison with other EU countries. The case study focuses on relatively

antagonistic evolution of the average unemployment rate in Europe - which is characterized by some stationary - and that of Greece, which has experienced notable increases. Government debt was not ignored it, being commensurate with a reference to GDP.

Finally, we conducted an analysis of specific data banking. In this regard, we conducted a spatial analysis of the rate of bad loans in three different time periods considered representative: 2006 (pre-global economic crisis), 2010 (post-global crisis) and 2014 (current period). A common feature of all three elements reveals a significant departure from the values associated with Greece's European Union average, the three can be both causes and effects of the current situation (due to existing macroeconomic endogeneity data).

## 2. Methodology

The vast majority of data used in the case study were taken from the web pages of the World Bank (the unemployment rate, the growth rate of GDP NPL), Eurostat (graphical support necessary spatial analyzes) or Cooperation Organization and Economic Development (government debt).

The data and graphs were composed using Microsoft Excel. Have spatial processing formats are being developed using econometric statistical software used GeoDa. The map (Shapefile format) was provided by Eurostat, as amended by the nature of the exclusion of countries from the map that highlight the original fifty European territories (sovereign and non-sovereign but) were GIS Map Window made through the program. EU maps faithfully reproduce the image in three periods taken as reference: 2006 (for pre-global financial crisis period) - "E.U. 25 ", 2010 (the period after the financial crisis) - "E.U. 27 "and 2014 (~ current period) - "E.U. 28 ".

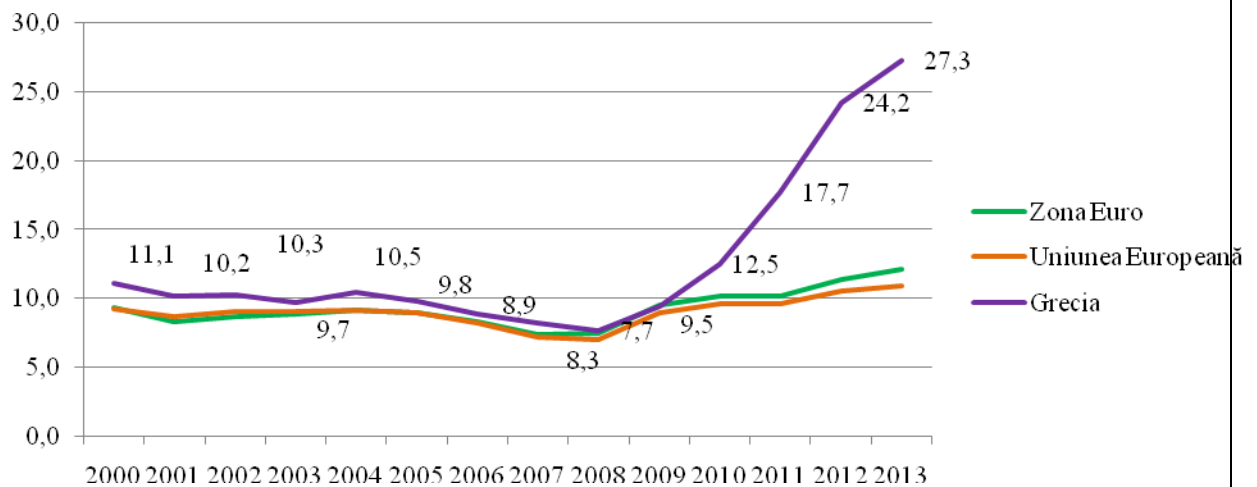
## 3. Case Study

### The unemployment

An important element that contributed to greater economic problems of Greece is the lack of jobs and high unemployment. It occupies a leading position among European Union member states in recent years in terms of unemployment. According to data taken from the online World Bank since 2009 this statistic has continued to grow, stopping at the level of 27.3% four years later. Most of those without jobs are young people, the situation of the Greek State in this respect is considered more serious than the US during the Great Depression of the '30s (O'Brian, 2015) [6].

While the period 2000-2010 the unemployment rate was close to the European average, with the arrival of the decade in 2010 it was removed more and more. The discrepancy at being one notable 2013: 27.3% - Greece, 12.1% - 10.9% Euro zone and European Union - as appears from Figure 1.

Figure 1. The evolution of unemployment in Greece, the European Union and the Euro (2000-2013).



Source: Author's calculus according to data provided by the World Bank.

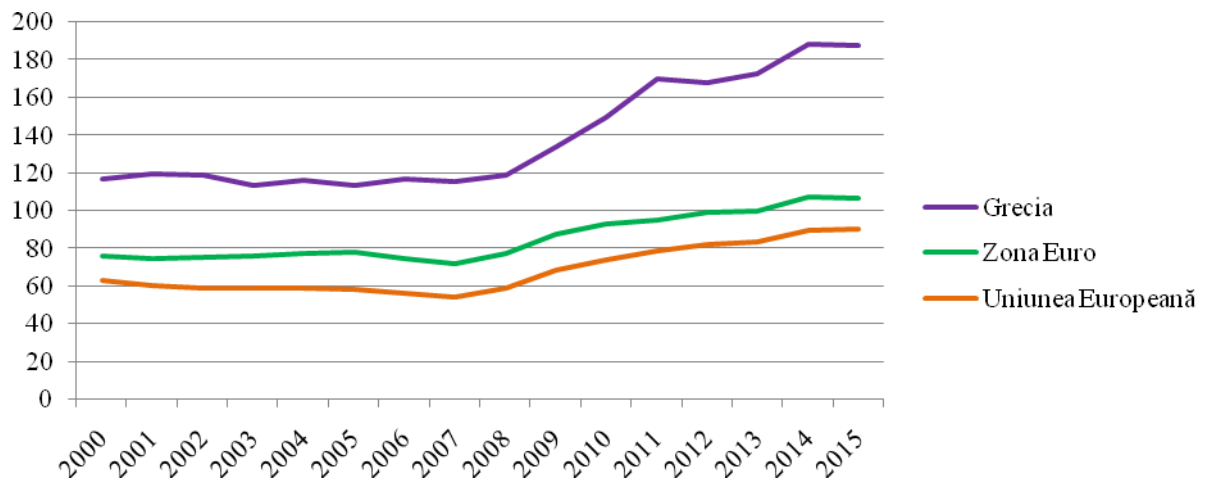
This is not the only problem of the Greek economy, this crisis with multiple causes as pillars. Next, the focus is on government debt.

### Public Debt

Another notable aspect in shaping the economic profile of Greece at the moment, in the crisis is public debt. Using data provided by the Organization for Economic Co-operation and Development, we can achieve a brief analysis on this problematic aspect of the Greek State. In this regard, Figure 2 represents the evolution of public debt in Greece over the

period 2000-2015, drawing a parallel with the euro area average (approx. 2015 - "Euro 19")<sup>i</sup> and European Union (approx. 2015 - "EU 28")<sup>ii</sup>.

Figure 2. The evolution of the government debt of Greece, the EU and the Euro area (2000-2015).

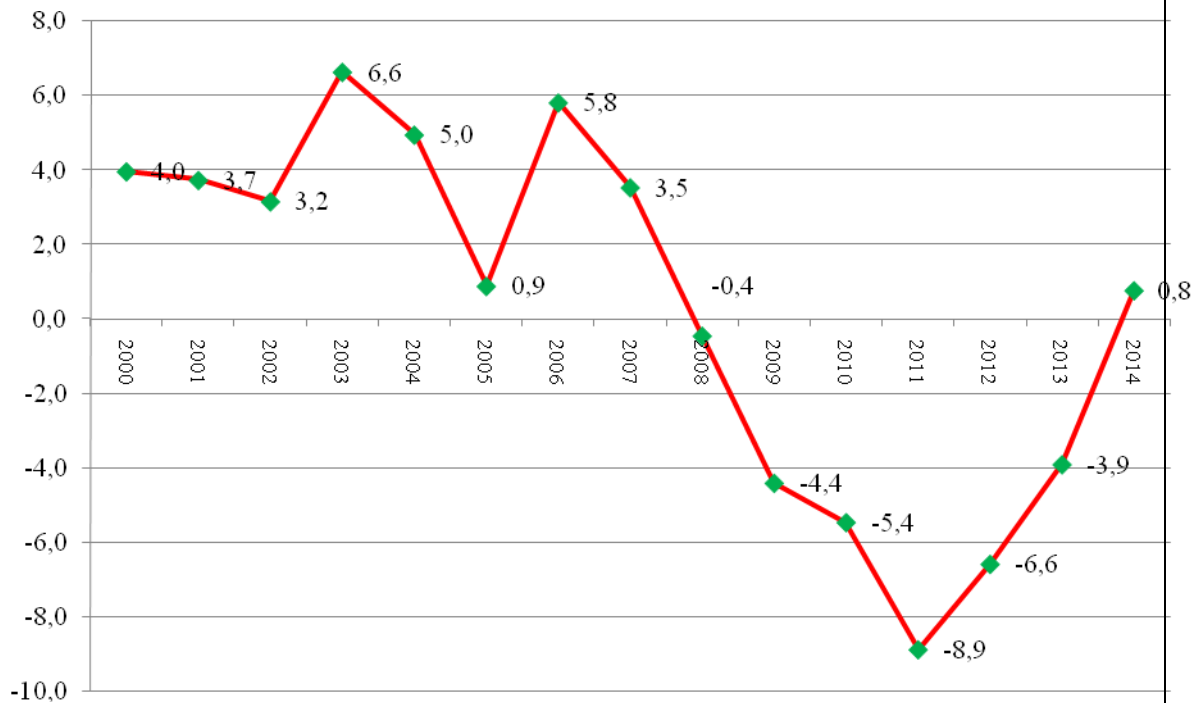


Source: Author's calculus according to data provided by the Organization for Economic Co-operation and Development.

It can be seen that since 2000, Greece's government debt amounted to more than 100% of the total GDP of the country. Amounted to 116.4%, it was well above the average level of EU states, which amounted to just over 63%.

Debt progressed sequentially as data in Figure 2 highlights, reaching 2015 at the alarming level of 188.2%, exceeding twice the European average. The seriousness of this issue is reinforced by the fact that Greece's gross domestic product in recent years, negative growth rates, which contributed to a sharp erosion of the Greek economy. The decline in GDP growth began in 2006, while in each year after 2008 to present (except 2014) the Gross Domestic Product in absolute value was reduced repeatedly.

Figure 3. The evolution of the growth rate of GDP of Greece (2000-2014).

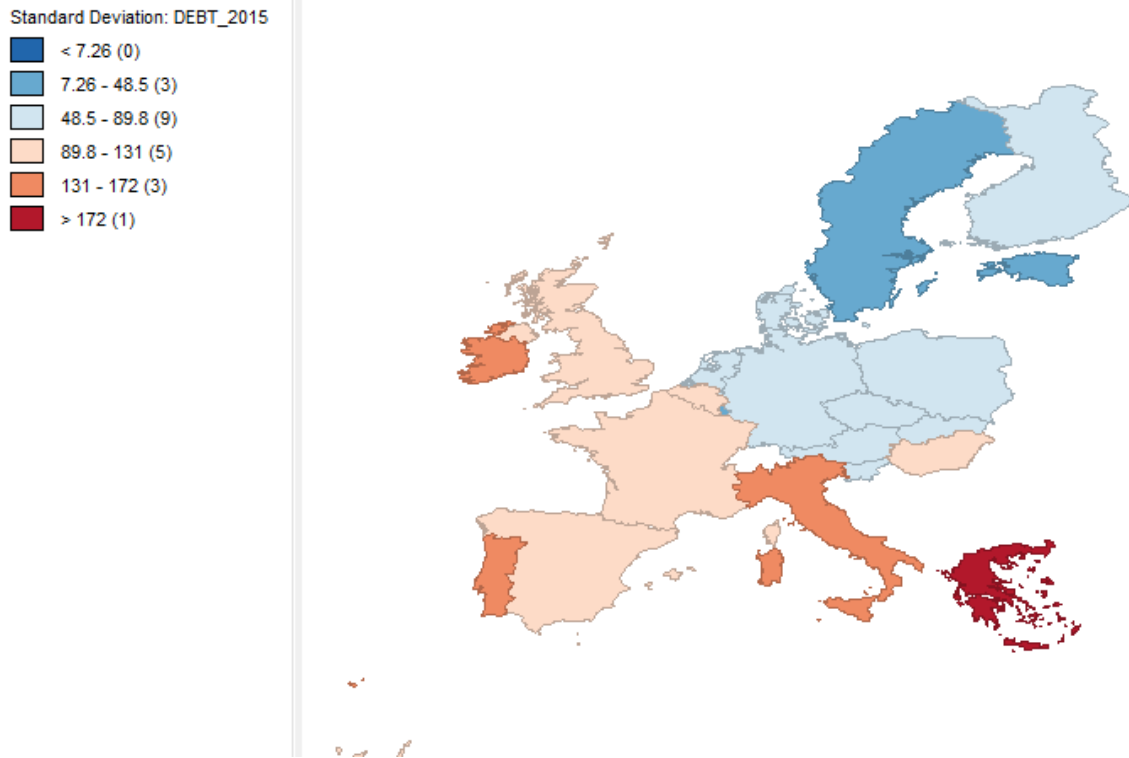


Source: Author's calculus according to data provided by the World Bank.

Greece's government debt as a percentage of GDP is not only the highest among EU member states in 2015, but also an abnormally marked in comparison with other European territories. This can be seen in Figure 4 showing a map of the

European Union (including the only regions for which data was provided OECD), focusing this analysis on spatial outlier detection.

Figure 4. Map of the European Union<sup>ii</sup> emphasizing the standard deviation from the average government debt.



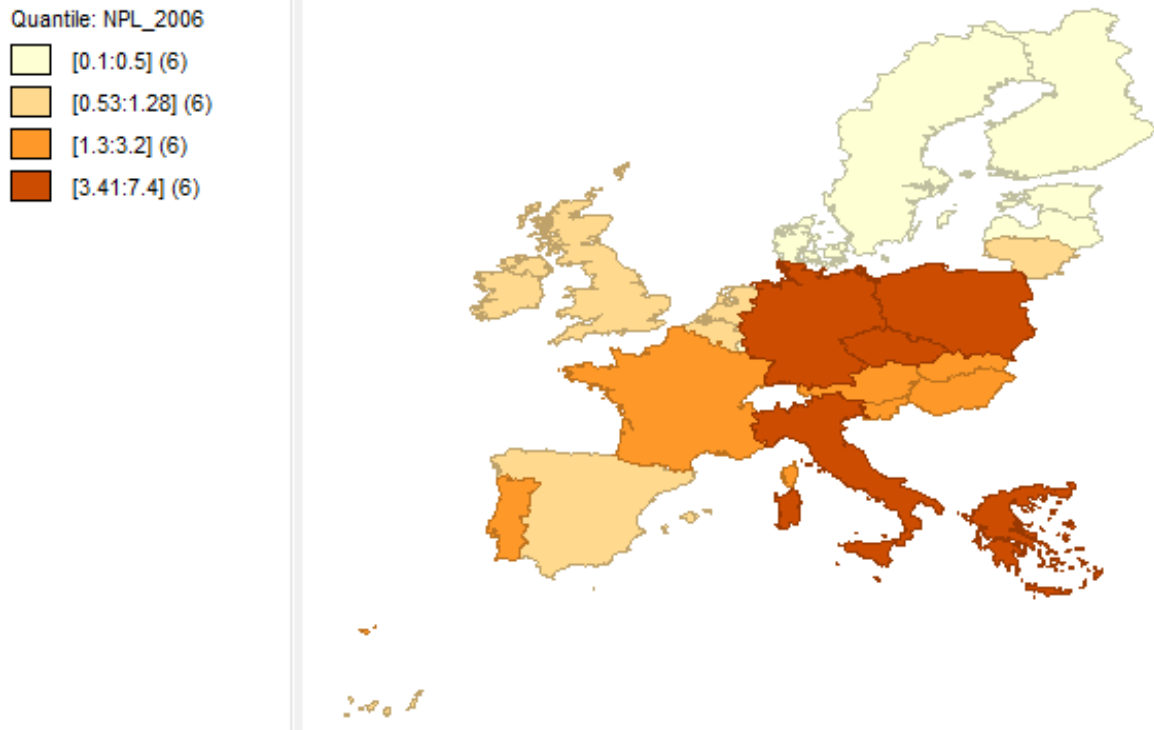
Source: Author's Geode graphic, according to data provided by the Organization for Economic Co-operation and Development.

Figure 4 outlines that in this case, Greece is an outlier; the recorded value of its government debt is one that exceeds high or medium levels. With GDP falling and rising government debt Greece, the Greek economy as a whole begins to be affected sectors being bypassed particular problems. In the context mentioned in this sub-section (the weakening economy as a whole) and the rise in unemployment becomes an extension of the analysis of pertinent banking. Details on the classification of countries according to government debt are presented in Annex 1.

### Nonperforming loans

One of the most important problems of the Greek banking sector is underscored by the high share of bad loans in total loans of commercial banks. While a rate increase may be associated with a large number of causes, such as unemployment, the current crisis has unequivocally put a mark in this area. The current situation is best designed under through benchmarking. Specifically, by comparing the situation of Greece with other European Union member states and how they have taken steps to reduce bad loans following the financial crisis that hit the global economy in the second half of the decade 2000-2010.

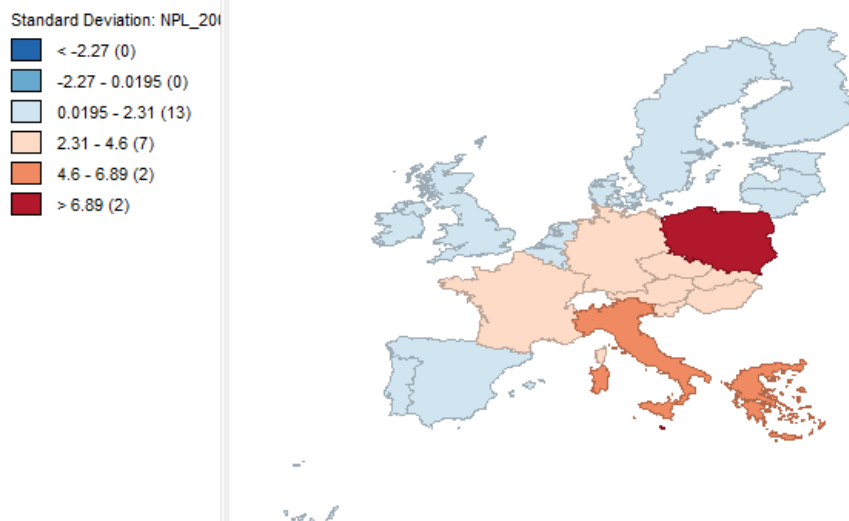
In 2006 - marking period preceding the economic crisis triggered in 2007 Greece recorded a level of NPLs of 5.4% of those granted by commercial banks, above the average level in the European Union (EU 2005), amounting to 2.61%. At this time, Greece was second only to Malta and Poland, which had a ratio of NPLs to total loans of 7.09% and 7.4% respectively. Figure 5 shows the best areas in U.E. 25 (approx. 2006) how they were located from the point of view of the indicator.<sup>i</sup>

Figure 5. Map U.E. 25<sup>iii</sup> highlighting bad loans for 2006.

Source: Author's Geode calculus, according to data provided by the World Bank.

In the figure above, it can be seen that Greece is part of quintile / category with the highest rates of non-performing loans in the European Union in 2006 (along with Malta, Italy and the Continental Europe including Germany, Poland or the Czech Republic).

At the opposite extreme lie the northern territories, known for efficient economic systems (Denmark, Finland and Sweden) and high living standards, the Baltic States (Estonia and Latvia) and Luxembourg. To monitor whether the statistical point of view, the value of non-performing loans in Greece in 2006 is considered one aberrant compared the sample standard deviation map is constructed (Figure 6).

Figure 6. Map U.E. 25<sup>iii</sup> emphasizing standard deviation from the average government debt.

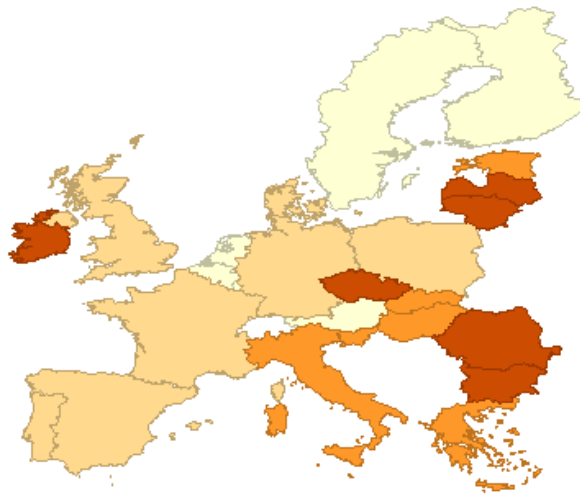
Source: Author's Geode calculus according to data provided by the World Bank.

Following Figure 6 illustrates the deviation from the average sample outliers are considered only those exceeding 6.89% - in this case hovering only Malta and Poland. Level recorded by Greece - along with that recorded by Italy - is high, but cannot be considered outlier.

Four years later, in 2010 - Greece has reached a value of 9.11%, almost two percentage points higher than the European average (EU 27 approx. 2010). However, as can observe in Figure 7, Greece is no longer in the group of European states with the highest rates of non-performing loans, instead of it being occupied now by countries such as Ireland, the Baltic states, the same Czech Republic, and new incoming states in the European Union - Bulgaria and Romania.

Figure 7. Map U.E. 27 for 2010 highlighting bad loans.

Quantile: NPL\_2010  
 [0.24:2.83] (6)  
 [3.2:5.19] (7)  
 [5.38:10] (7)  
 [11.1:23.3] (6)

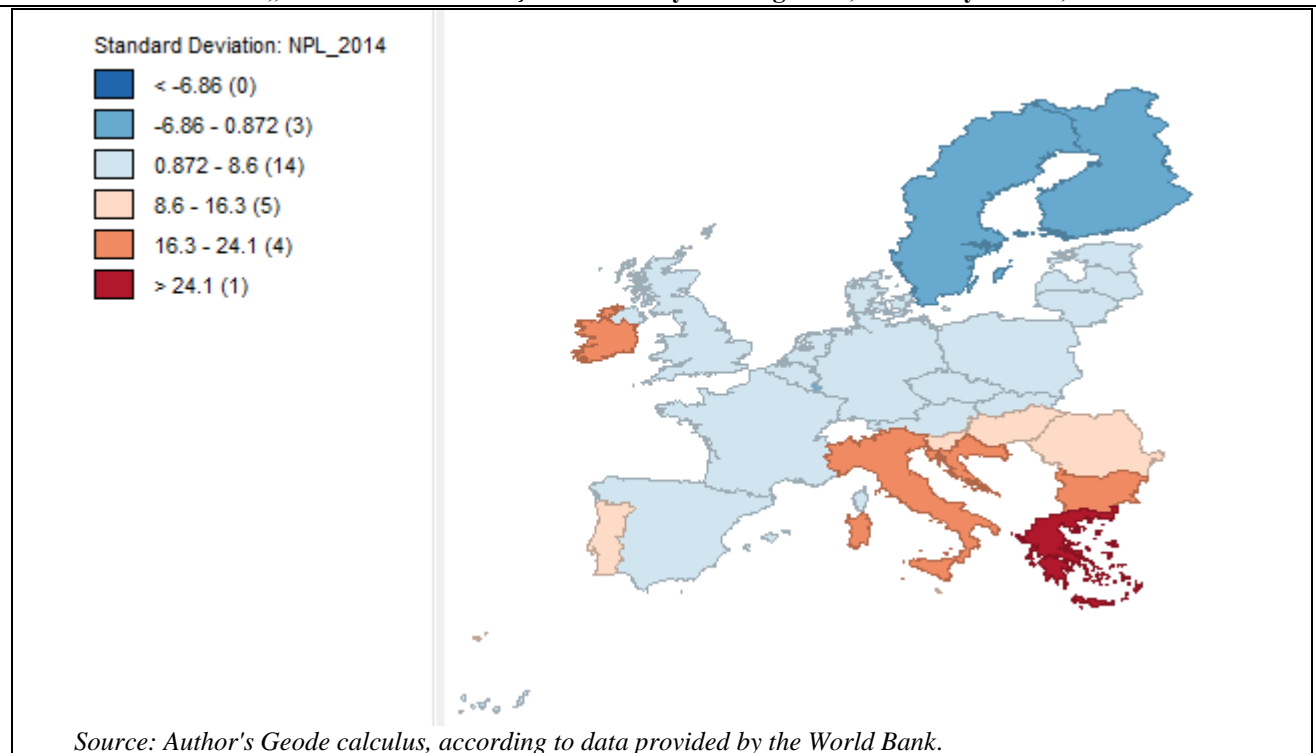


Source: Author's Geode calculus, according to data provided by the World Bank.

In the present context, the question cannot be declared Greece in terms of the level of nonperforming loans aberrant one, therefore, a study of standard deviations from the mean value is no longer needed.

However, the situation changed in 2014, when Greece was returned to the category of countries with the highest rates of non-performing loans. These amounted to more than 34.25% of total loans issued by Greek banks, being the second highest value recorded by a member country of the European Union for 2014, surpassed only by Cyprus. However, far outpaces the average value U.E. approx. 2014 (for U.E. 28) amounts to 11.25%<sup>ii</sup>, an aspect that can be seen in Figure 8.

Figure 8. Map standard deviations indicator of bad loans in total credits - U.E. 2014.<sup>ii</sup>



As shown in Figure 8 spatial analyzes specific techniques - through standard deviations map highlights outliers far removed from average (either extremely low or extremely high). In this case, Greece is different from the rest of the EU approx. 2014 by the high percentage that displays only outlier being recognized in this period.<sup>iii</sup>

#### 4. Conclusions and Limitations of the Study

Exiting the current global financial crisis undoubtedly requires state intervention in economies with all the negative consequences that result from it. One of the myths refuted by the current global financial crisis is that the bank is fundamental actor of the market economy, whose unwritten rule is that those who do not cover their expenses from earnings out of the game through bankruptcy. The fact that banks have huge losses have not gone bankrupt, has demonstrated that they are no longer subject to the laws of market economy but are providing utility providers like electricity, water etc, (Bătrâncea, Bătrâncea, 2009) [8].

US crisis is caused primarily by a generalized decrease in consumption, which led to the US economic growth always, leading to lack of cash. Thus, all financial instruments that American companies tried to increase the capital but this measure not give yield under these conditions.

The analysis of performances were meant to highlight the significant differences between the level at which Greece is now compared with the European average, and during his up to this level. It was observed that the unemployment rate is much higher than the EU average, the same extreme values mirrored in government debt and nonperforming loans.

The main limitations of the study lie in the insufficient data. One example is the unemployment rate - the level of 2014 is not available or those from the first quarter of 2015. In addition, given that the Organization for Cooperation and Development has no data for all EU countries, this can distort the image to a certain level of reality.

In addition, other variables could be an important research direction to capture different facets of Greece's economic problems. In addition, a more advanced statistical and econometric by processes can be another future direction. The main problem lies in the lack of data, regardless of their structure and the types of analysis. Specifically, in the case of analysis "cross-section" where individuals equivalent consists of the European Union - and by extension Europe - a series of requirements be met; including data normality - something utopian in most statistical analyzes, it is necessary due to the small number of observations that will decrease even possible setback. The small number of years for which data relating to Greece and the difficulty of finding reliable data on quarterly or monthly fractions guy put a number of problems in the case of using time series analysis. An alternative would be an analysis using a panel of countries.

## References

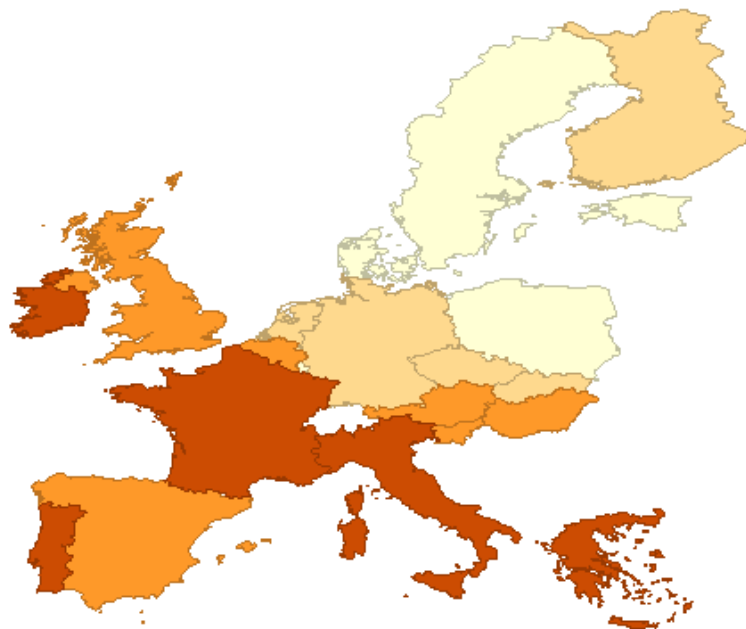
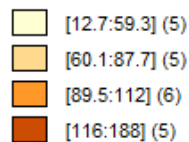
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## Annexes

### Appendix 1

Annex 1. Map U.E. 28<sup>ii</sup> for 2015 highlighting government debt.

Quantile: DEBT\_2015



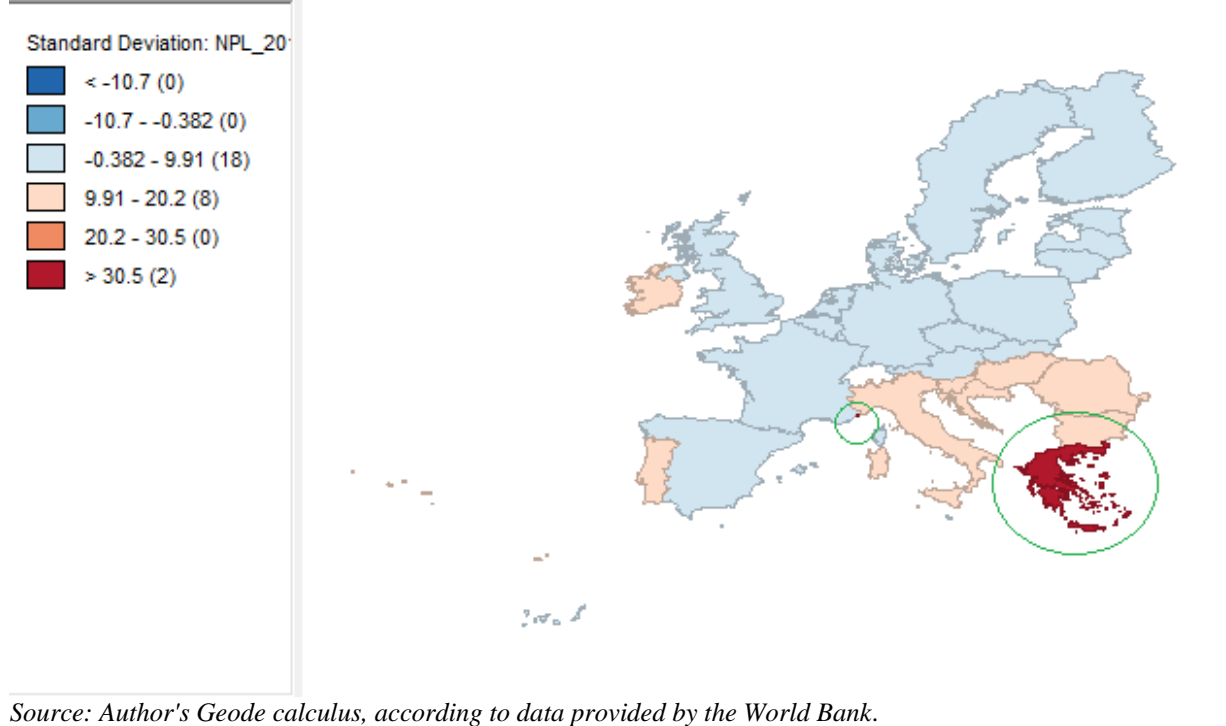
Source: Author's Geode calculus, according to data provided by the Organisation for Economic Co-operation and Development.

Greece, with government debt in 2015 of around 188% of GDP, is placed in the group of countries with the highest levels of it, along with the eastern states (France, Ireland and Portugal) and next to Italy.



## Appendix 1

Annex 2. Map U.E. 28 for 2014 highlighting non-performing loans (by value for Cyprus).



In this case, the map editing was kept Monaco region to be assigned a territory associated value of performing loans in total loans related state Cyprus (c. 2014). It can be seen that the inclusion of much higher value of Cyprus does not distort the results shown above, Greece still remains an outlier.

<sup>i</sup> The MAP does not include Cyprus State the following reasons: (1) - there is no water region Shapefile template provided by Eurostat; (2) - no data for the region Cyriot pre-2008 relative to this indicator.

<sup>ii</sup> European Union - includes data for all countries except Bulgaria, Cyprus, Croatia, Malta, Latvia, Lithuania and Romania, for which the database does not collect records.

<sup>iii</sup> The map does not include Cyprus State the following reasons: (1) - no region of the template provided by Eurostat Shapefile; (2) - no data for the region Cyriot pre-2008 relative to this indicator.

<sup>iv</sup> According to data from the World Bank (November. 2015) and excluding amounts relating Finland, France, Germany and the State Luxembourg (those not published) - the replacement was preferred due to the fact that if these countries were not any major changes from one year to another.

<sup>v</sup> Lack of official data for 2014 to build this map were recorded levels of nonperforming loans used in 2013 for the following countries: France, Germany, Luxembourg and Finland in 2012. Media embossed map (8.6%) is calculated taking into account these values and excluding Cyprus, which was not present on the original template of the map published by Eurostat.

<sup>vi</sup> If inclusion of Cyprus, both would be considered outliers / outlier superior (please consult the explanatory model in Annex 2).