Assessing the impact of the economic crisis on regional development in Greece, focusing on the Forest Sector

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Abstract
The global financial crisis has severely affected Greece in many areas, causing various setbacks on economic and social level. Regional development was heavily influenced, many regions of Greece having experienced a significant economic decline. The forest sector plays a crucial role in regional development, as it provides employment opportunities and contributes to the maintenance of rural population. The aim of the paper is to assess the effect of the economic crisis on the Forest sector in Greece and to compare with the performance of other EU member states, based on the analysis of EUROSTAT data. Greece is in the last place among the 15 countries of the European Union examined that have increased their output in forest based activities in the period 2008-2014. Moreover, Greece has suffered the largest percentage lost in the number of employed persons in the forest sector during the crisis, losing almost half the number of employed persons between 2008 and 2017. Forest Policy in Greece should focus on the improvement of these two key indicators: employment and the output of the forestry sector, which could strongly affect regional development in Greece.

Keywords: Regional Development, Forestry, Policy making

JEL classifications: R58, Q23, L73

Introduction

The global financial crisis has severely affected Greece in many areas, causing various setbacks at economic and social level. Regional development was heavily influenced, many regions of Greece having experienced a significant economic decline. Forests play an important role in regional and rural development. Moreover, regional development has been linked with sustainable forest management (Elbakidze et al., 2007). The need for conservation of natural resources of the forests in particular has been acknowledged since the middle 1980's, as through a successful forest policy performance forests combine economic, environmental and social benefits (Repetto, 1987). The forestry sector is recognized as a key enabler for the sustainable development of rural areas, through job creation, its contribution to Gross Domestic Product growth and its importance for the successfulness of many related business activities, as well through

its instrumental role in the maintenance of quality of life improvement (Czerepko et al., 2016). The creation of employment opportunities in the Forestry sector is especially important for mountainous, less favoured areas, contributing to the maintenance of local population (Kupčák, 2011).

Forest businesses are part of the global economy, because the economy of many rural regions depends on the forestry sector (Tykkyläinen et al., 1997). Therefore, it is expected that the global economic crisis will affect the forestry sector worldwide. The wellbeing of residents in rural areas relies on investments for effective forest management that increase wood supply and satisfy the increased wood demand at regional level (Karttunen et al., 2018). The investment in innovation is another factor that promotes regional development in rural areas with smallholders involved in the forestry sector (Seeland et al., 2011).

Regional Forest Programmes (RFP) are important tools for the implementation of forest policies at the regional level. RFP take into consideration the multiple role of forests and the spirit of sustainability equally promoting the production of wood and non wood forest products, based on environmental, economic and social criteria (Niskanen and Väyrynen, 1999). However, the absence of Common Forestry Policy within the European Union sets funding barriers for the implementation of forest programs. Difficulties in funding regarding common policies in the EU were mentioned by researchers as early as the middle 1990's (Hooghe and Keating, 1994). The EU seeks to simplify the process of funding and surpass bureaucratic obstacles by promoting collaboration among policies that belong in similar fields, such as the Common Agricultural Policy (EC, 2014). The necessity for coordination between forest policy and land planning policy was underlined in a study in Spain in the early 2000s (Montiel and Galiana, 2005).

The European Union contributes to the economic development of member states through five main funds: the European Regional Development Fund (ERDF), the European Agricultural Fund for Rural Development (EAFRD), the European Social Fund (ESF), the Cohesion Fund (CF) and the European Maritime and Fisheries Fund (EMFF). The European Regional Development Fund (ERDF) was established in 1975 and its main aim is to reduce inequalities between the regions of European Union supporting sustainable development in rural areas; less favoured areas also benefit from the ERDF using the economic assistance in order to diminish their natural disadvantages. The European Agricultural Fund for Rural Development (EAFRD) finances rural development programs within the EU (EU, 2013).

On the other hand, during the crisis Greece had to negotiate with international lenders: the European Commission (EC), the European Central Bank (ECB) and the International Monetary Fund (IMF) as a result of the Memoranda of Understanding, which led to the implementation of austerity policies. These policies had a serious impact on environmental policy in Greece, mainly resulting from the cuts in funding for the protection of the environment and staff reduction in the environmental services (Lekakis and Kousis, 2013).

The aim of the paper is to assess the effect of the economic crisis on the Forest sector in Greece and to compare with the performance of other EU member states, based on the analysis of EUROSTAT data.

Materials and Methods

Data from EUROSTAT were collected and analyzed in order to assess the effect of the economic crisis on the Forest sector in Greece. The output of forestry and connected secondary activities in million euros is an indicator for the development of the forestry sector. Fifteen countries of the European Union that have increased their output during the period 2008-2014 were examined. Another key indicator for the development of the Forestry sector is the number of persons employed in forestry and forest based industry. 26 out of 28 countries of the European Union were examined (current composition) and the number of employed persons between years 2008 and 2017 was compared. Luxemburg and Malta were the only EU countries that did not provide sufficient data for the years examined and were therefore excluded from ranking.

The data include economic data on forestry and logging, physical and monetary data on supply and use of wood, and employment data. Aggregates include output, intermediate consumption, gross value added, fixed capital consumption, gross fixed capital formation and different measures of income of forestry and logging. Employment data present an estimation of the number of employees in forestry, logging, and the manufacturing sector. Forest accounts provide a detailed view of forest-related assets (land and timber), activities (mainly forestry and logging) and flows of wood products. The data are collected as part of European Forest Accounts (EFA), which also cover wooded land, timber, output of the forestry industry by type, and labour input in annual work units (AWU). They are in current basic prices and are compatible with National Accounts. The accounting data present aggregates for the economic activities of forestry and logging in each country. The units of data collection should be local units or enterprises; however, not all countries provide such information, particularly on the forestry activities of farms mainly engaged in agriculture (Eurostat, 2018a).

Also, the following hypotheses were examined:
H_0: Employment and output in forestry sector have no correlation
H_1: Employment and output in forestry sector are significant related

The test of the hypotheses was performed with the Statistical Package for the Social Sciences, IBM SPSS Statistics 22.

The most recent edition (2016) of the EU Regional Competitiveness Index (RCI) was also considered in order to identify strengths and weaknesses. Launched in 2010 and published every three years, the RCI allows to assess the development of a region and to compare with other EU regions (EC, 2014).

Results and Discussion

Uneven regional development has been observed among the members of the European Union (Hadjimichalis, 2011; Martin, 2015). Strong inequalities are noticed among different regions in the European Union, from very rich regions mostly located in Central Europe to very poor ones mostly located in South Eastern Europe. Regional Development in Greece was crucially affected by the economic crisis and the country as a whole scored very low in the Regional Competitiveness

Index for the year 2016. Only two other EU countries exhibit similar low performances: Bulgaria and Romania (Figure 1).

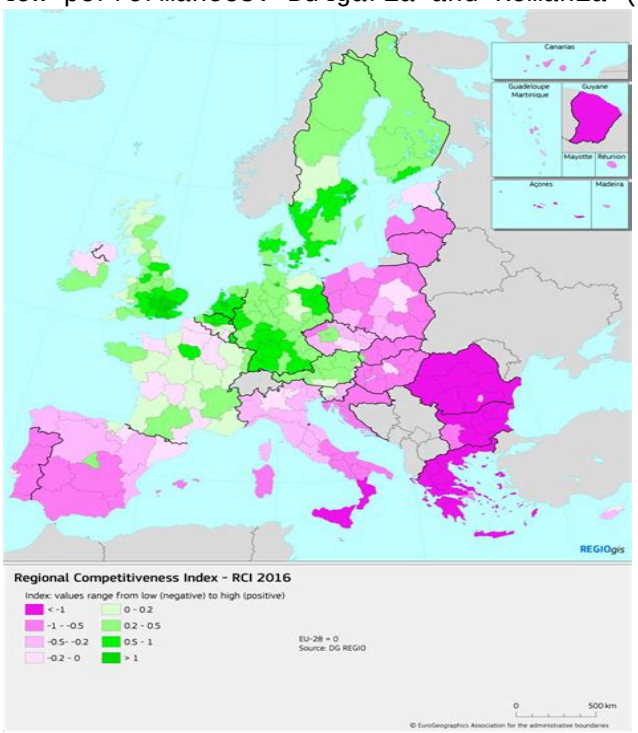

Figure 1: Regional Competitiveness Index - RCI 2016 (Source: Annoni et al., 2017)

Greece has received 20,38 billion euro funding from the five ESI Funds and the Youth Employment Initiative (YEI) for the period 2014-2020 (Figure 2) in order to support socioeconomic development (EC, 2015).

ERDF : 8,17 billion €
EARDF : 4,72 billion €
ESF: 3,69 billion €
CF: 3,25 billion €
EMFF: 0,389 billion €
YEI: 0,172 billion €

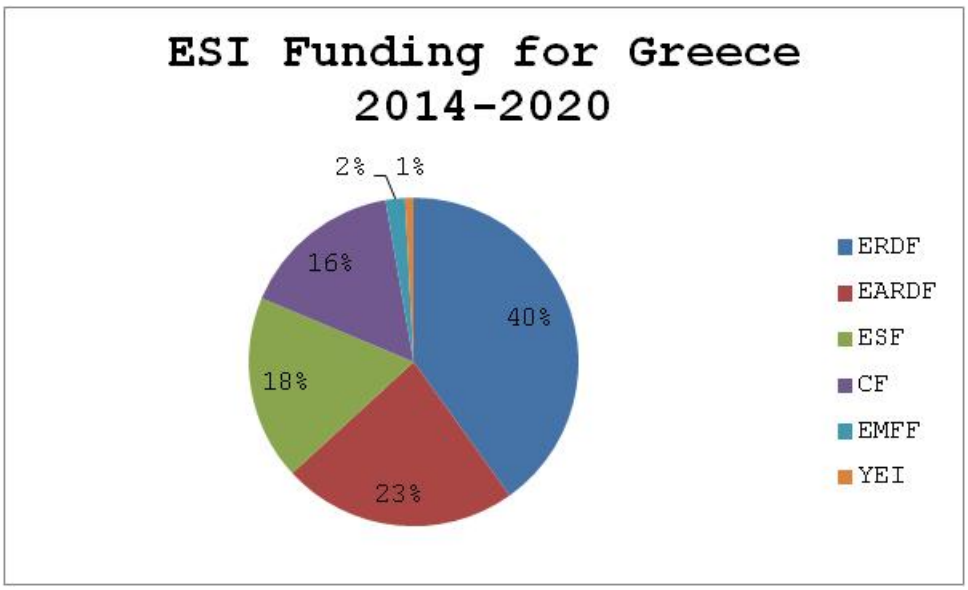

Figure 2: ESI Funds Budget for Greece (Source: EC, 2015)

Greece is in the last place among the 15 examined countries of the EU having increased their output in forestry and connected secondary activities between the years 2008 and 2014 (Figure 3). Greece increased the output only by 1,5%, while at the same period of time Romania has an increase of almost 131%, and the average increase of the examined countries was 36,27%.

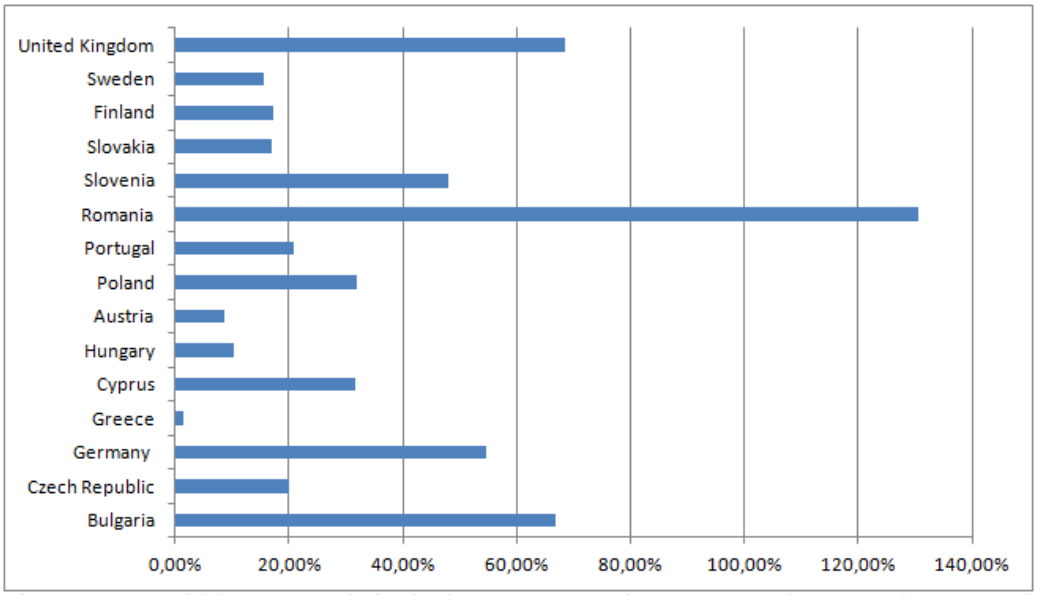

Figure 3: Difference (%)of forestry and connected secondary activities in output between years 2008 and 2014.

Table 1 presents the difference in the number of employed persons in forestry and forest based industry between the years 2008 and 2017.

Table 1: Employed persons % change between years 2008 and 2017

	2008	2017	%
European Union (current composition)	538,0	536,0	-0,37%
European Union (15 countries)	279,7	245,3	-12,30%
Belgium	3,1	2,2	-29,03%
Bulgaria	25,0	32,5	30,00%
Czech Republic	30,9	30,3	-1,94%
Denmark	2,7	2,6	-3,70%
Germany	44,2	35,6	-19,46%
Estonia	7,1	5,1	-28,17%
Ireland	1,9	3,2	68,42%
Greece	7,1	3,9	-45,07%
Spain	32,0	29,0	-9,38%
France	48,5	28,5	-41,24%
Croatia	13,0	15,7	20,77%
Italy	41,7	52,6	26,14%
Cyprus	0,9	0,6	-33,33%
Latvia	15,1	13,5	-10,60%

Lithuania	14,2	13,1	-7,75%
Hungary	12,6	23,2	84,13%
Netherlands	2,2	2,0	-9,09%
Austria	11,7	9,9	-15,38%
Poland	60,5	86,0	42,15%
Portugal	16,0	13,5	-15,63%
Romania	49,1	47,4	-3,46%
Slovenia	4,5	3,6	-20,00%
Slovakia	25,4	19,6	-22,83%
Finland	22,7	17,8	-21,59%
Sweden	24,9	24,0	-3,61%
United Kingdom	21,1	20,3	-3,79%

The number of employed persons in forestry and forest based industry in the European Union of 28 countries was almost the same in the year 2017 as in 2008, the beginning of the economic crisis. However, the number of employed persons in forestry and forest based industry was affected differently in the EU countries. Only six countries have increased the number of employed persons during this period, while the remaining countries for which sufficient data were available (20 countries and not 22, since Luxemburg and Malta did not provide data for the examined period), suffered by reduction with a variation of -1,94% to -45,07%.

Table 2 was created using data in Table 1 and provides the ranking of EU countries at a glance.

Table 2: Ranking of EU countries (Employed persons % change between years 2008 and 2017)

Ranking	**Country**	**+/- %**
1	Hungary	84,13%
2	Ireland	68,42%
3	Poland	42,15%
4	Bulgaria	30,00%
5	Italy	26,14%
6	Croatia	20,77%
7	Czech Republic	-1,94%
8	Romania	-3,46%
9	Sweden	-3,61%
10	Denmark	-3,70%
11	United Kingdom	-3,79%
12	Lithuania	-7,75%
13	Netherlands	-9,09%
14	Spain	-9,38%
15	Latvia	-10,60%
16	Austria	-15,38%
17	Portugal	-15,63%
18	Germany	-19,46%
19	Slovenia	-20,00%
20	Finland	-21,59%
21	Slovakia	-22,83%
22	Estonia	-28,17%
23	Belgium	-29,03%
24	Cyprus	-33,33%
25	France	-41,24%
26	Greece	-45,07%

Greece is also in the last place regarding persons employed in forestry and forest based industry, having lost almost half of the number of employed persons in forest industry during the economic crisis. Cyprus, another country with a Memorandum of Understanding (MoU) is also ranked among the last places. On the contrary, Hungary has achieved an impressive increase during the same period, followed by Ireland, a country that suffered from financial problems especially in the banking sector during the crisis.

Figure 4 shows the scatterplot of the dependent (employment) and the independent variable (output).

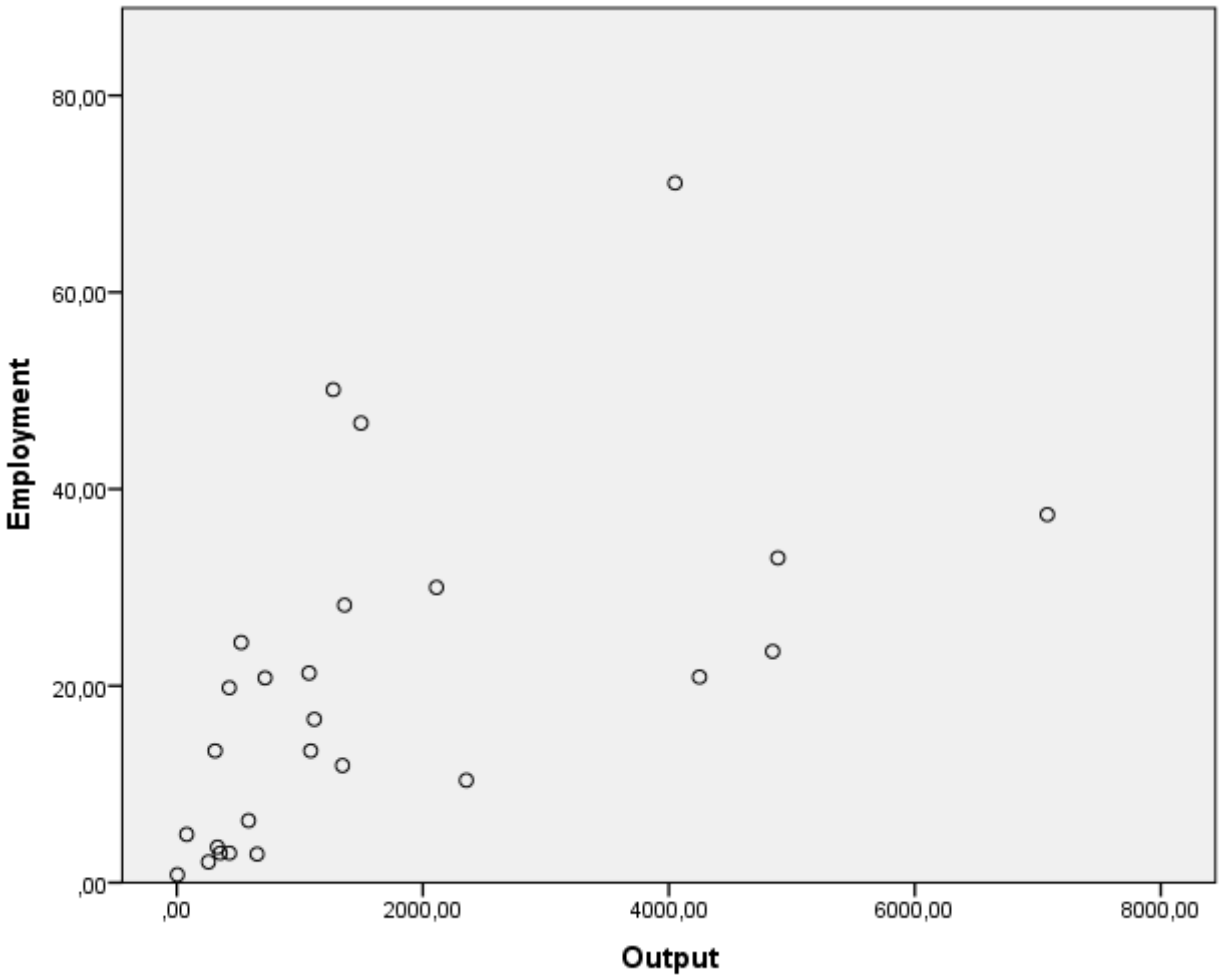

Figure 4: Scatterplot of dependent and independent variable

According to the scatterplot the dependent (employment) and the independent variable (output) have a positive correlation. In order to check the level of correlation between the variables, the Pearson Correlation Coefficients Test was used(Table 3).

Table 3: Pearson Correlation for employment and output

Correlations

		Employment	Output
Employment	Pearson Correlation	1	,557**
	Sig. (2-tailed)		,003
	N	26	26
Output	Pearson Correlation	,557**	1
	Sig. (2-tailed)	,003	
	N	26	26

**. Correlation is significant at the 0.01 level (2-tailed).

According to the results, the Pearson's R (Pearson's Correlation Coefficient) for the correlation between the employment and output variables is 0,557. Since r>0,5 there is a strong relationship between the two variables. Moreover, since the sig. (2 tailed) value is less than 0,05 (= 0,003), we can conclude that there is a statistically significant correlation between the two variables. That means that a reduction of output will result to the reduction of employment in the forestry sector.

Conclusions

The global financial crisis has severely affected Greece in the forestry sector. Employment in the forestry sector and the output of the forestry sector, two key indicators for the development of the forest sector significantly affecting forest policy decision making, were reduced dramatically during the crisis. Greece has achieved a marginal increase in the total output of the forestry sector during the crisis, while at the same period the average increase in EU countries was significantly higher. The number of employed persons in forestry and forest based industry in Greece has severely dropped in the last ten years; in the European Union this number has remained relatively stable for the same period.

Greece is in Level of importance (LOI) 2 according to the CA-RES report 2012 of the EU (Bittermann and Suvorov, 2012), meaning that the country uses between 10% and 30% of the applicable renewables (12,3% share of household wood fuel -assumed as 90% of solid biomass). The need for more renewable energy in the European Union is continuously growing; between 2005 and 2016 the consumption of renewable energy in the EU has been increased by 79%. Wood as a source of renewable energy is very important for the European Union, since in 2016 more than 1/5 (21,6%) of the EU's roundwood production was used as fuelwood (Eurostat, 2018b). In Greece, the fuelwood final consumption for the year 2016 was 3.513 thousand cubic meters (UN, 2017). Wood and wood products accounted for 6% of the total energy consumed within the EU in 2016 (Eurostat, 2018b). Moreover, the Compound Annual Growth Rate (CAGR) for roundwood (fuelwood) consumption in EU-28 for the years 2010-2015 (during the economic crisis) was 2,7% (Birdlife, FERN and Transport & Environment, 2017).

For the period 2014-2020, Greece has received over 20 billion funding from the European Structural and Investment Funds, mostly from ERDF and EARDF, but still experiences the effects of economic crisis in the forestry sector. The increased demand for firewood as a cheaper means for heating during winter, for instance, has led to a dramatic increase of illegal logging which can scarcely be controlled due to staff reduction in the Forest Services (Lekakis and Kousis, 2013).

According to the EU Regional Competitiveness Index 2016 (European Commission 2017), many regions in Greece presented a lower score compared to their performance in previous editions of the RCI. The same decline was observed in regions of Cyprus and Ireland, two more countries with a Memorandum of Understanding. The Forest Policy in Greece should focus on the improvement of employment and output in

forestry and connected secondary activities, which strongly bear upon regional development in Greece.

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