

THE IMPACT OF THE ECONOMIC CRISIS IN THE PROCESS OF CONVERGENCE OF THE GREEK REGIONS

Panagiotis KOUDOUMAKIS

Dr. Civil Engineer, Democritus University of Thrace (DUTH), Department of Civil Engineering,
Greece
pkoudoum@civil.duth.gr

George BOTZORIS

Assistant Professor, Democritus University of Thrace (DUTH), Department of Civil Engineering,
Greece
gbotzori@civil.duth.gr

Angelos PROTOPAPAS

Professor, Democritus University of Thrace (DUTH), Department of Civil Engineering, Greece
aproto@civil.duth.gr

Vassilios PROFILLIDIS

Professor, Democritus University of Thrace (DUTH), Department of Civil Engineering, Greece
vprofill@civil.duth.gr

Abstract

In this paper, the impact of the economic crisis on the convergence of the Greek region's economy to the European average is examined. In particular, it is being considered the condition of absolute β -convergence using the econometric model of Barro and Sala-i-Martin. The dependent variable was represented by the average value of Gross Domestic Product (GDP) per capita in Purchasing Power Standards (PPS). Additionally the hypothesis of the σ -convergence of the regions of the EU and Greece is being considered, based on the coefficient of variation weighted by population. The results of both absolute β -convergence and σ -convergence suggest a declining trend of convergence and persistence of inequalities for the regions of the EU, following the outbreak of 2008 economic crisis. Regarding the regions of Greece, the results indicate, on the one hand, their deviation from the average income of the regions of the EU and, on the other, a significant increase in the regional disparities in the period 2000-2016.

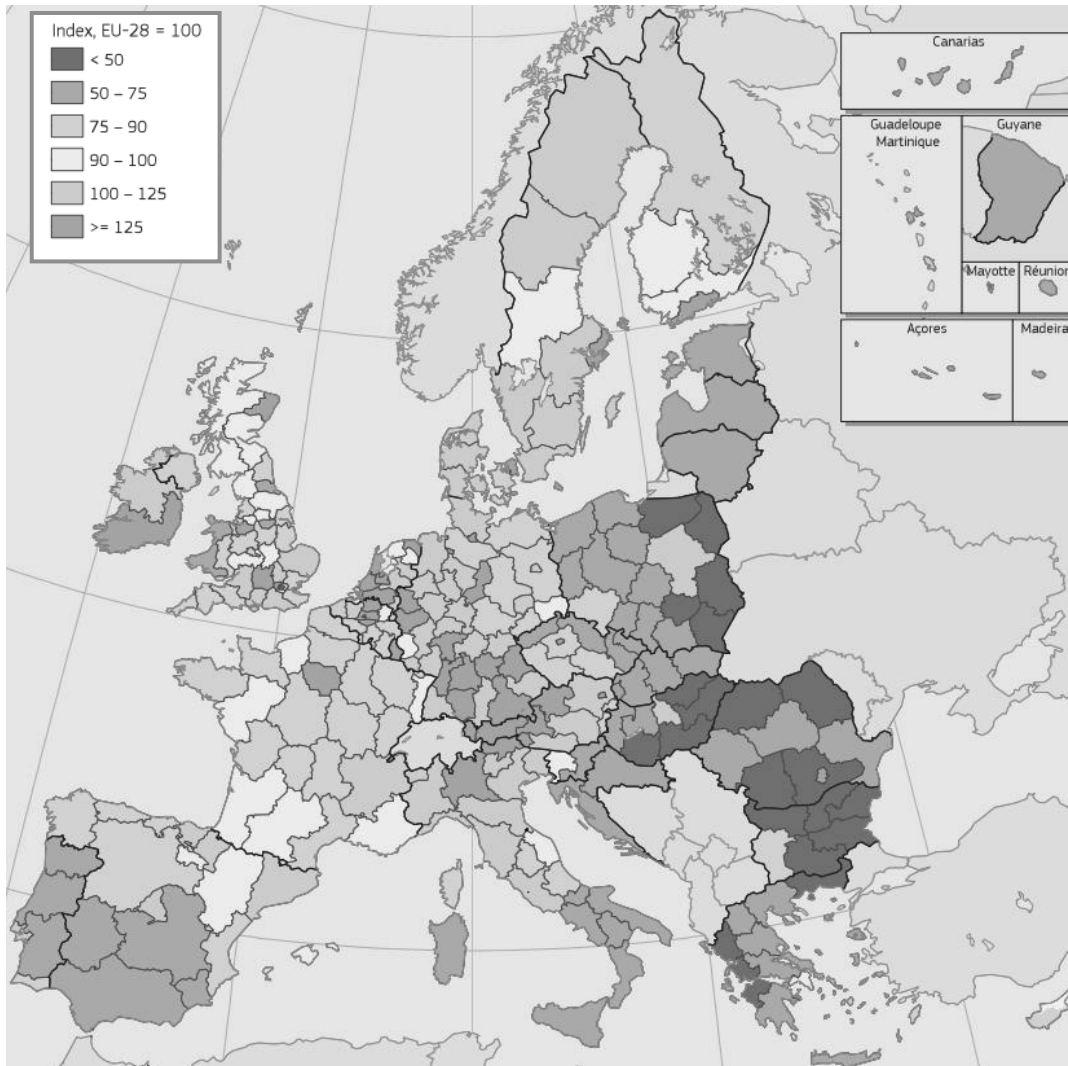
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1. Introduction

European economic integration, which began in 1957 with the Treaty of Rome and the creation of the European Economic Community, has always been accompanied by the idea of social cohesion among its member states. Cohesion was to be achieved mainly through the promotion of growth-enhancing conditions and the reduction of disparities between the levels of development of the various European regions.

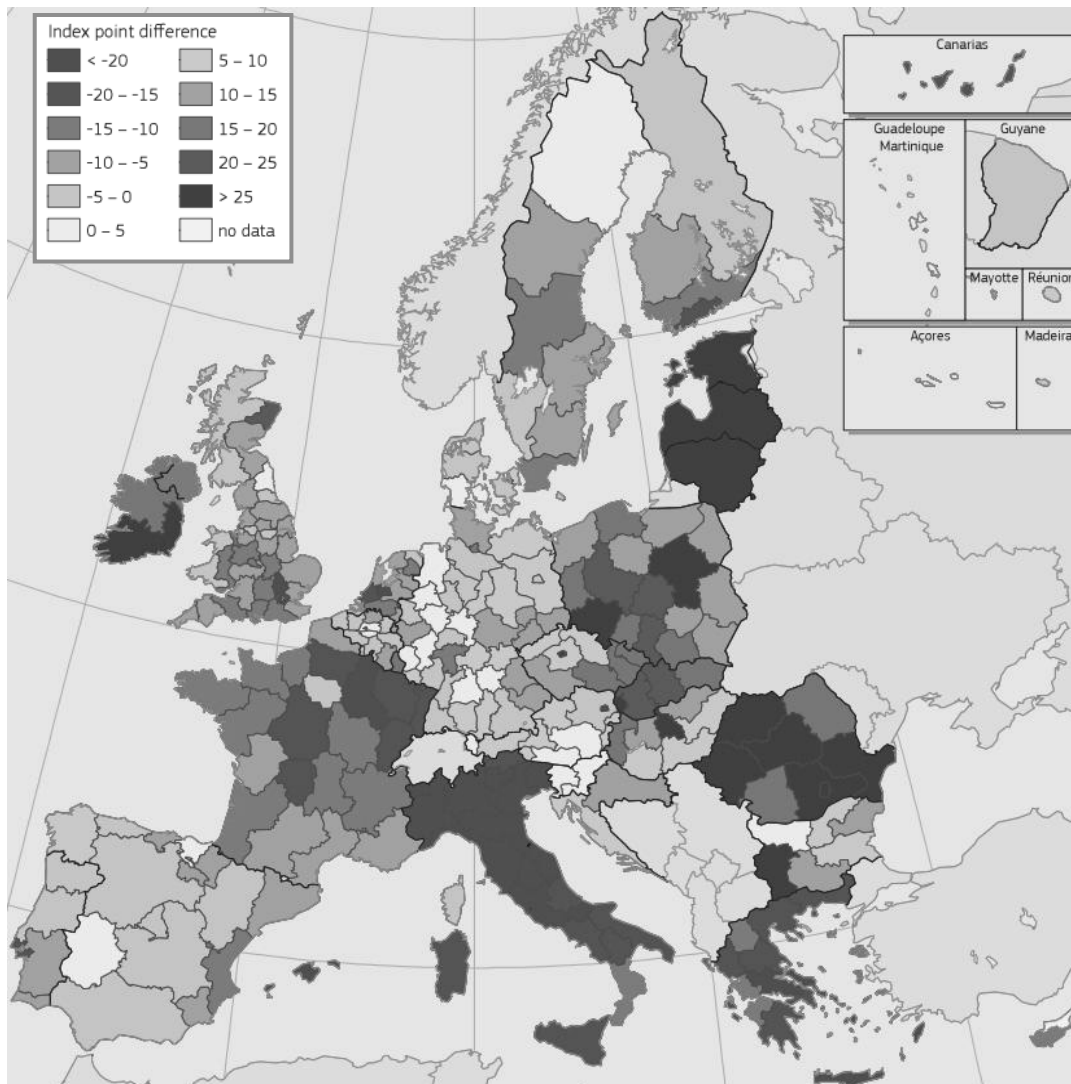
Addressing disparities in development is a key priority in all planned policies at all spatial levels (Lammarino et al., 2017; Lopez-Bazo et al., 2014). The negative impact of the economic crisis that occurred in 2008 continues to date in many regions. According to the 7th Report on Economic, Social and Territorial Cohesion (European Commission, 2017), more than one in four EU residents live in regions with Gross Domestic Product per capita in Purchasing Power Standards (GDP per capita in PPS) below 75% of the European average. Most of these regions are located in the eastern and southern Member States of the EU (Figure 1).

Figure 1: GDP per capita in PPS of the European Union regions in 2015

Source: European Commission (2017)

From 2000 to 2015 the regions of the eastern EU member states recorded a significant increase in GDP per capita in PPS (Figure 2). Its increase from 56% to 136% in regions of Romania and from 38% to 76% in regions of Bulgaria is indicative of the situation. This increase is estimated to be largely attributable to the substantial financial support given to the new eastern European Members States in the form of structural funds. It should be noted that Estonia (EE), Lithuania (LT), Latvia (LV), Poland (PL), Slovakia (SK), Hungary (HU) and the Czech Republic (CZ) are financially supported with resources coming from the European Regional Development Fund (ERDF) ranging from €1,427 per resident for Estonia (EE) to €1,058 per resident for Poland (PL). Also, Poland (PL) receives around €89 billion for the period 2014-2020, almost twice as much as €44 billion, which is allocated to the next member in line, Italy (European Parliament, 2016a; 2016b; 2015).

On the contrary, in the southern EU regions (Greece, Italy, Portugal, Spain) the situation has deteriorated considerably where there has been a reduction in GDP per capita in PPS which exceeded 20% in many cases. It is worrisome that the aforementioned deterioration concerning the southern regions of the EU coexists with a continuous increase in financial resources allocated to regional development policies (Hurst et al., 2000; Puga, 2001; European Commission, 2010, Koudoumakis and Botzoriz, 2015).

Figure 2: Change of GDP per capita in PPS of regions of the European Union

Source: European Commission (2017)

2. The process of convergence

In general, convergence defines the evolution of a variable towards a present value. In the theory of economic and regional development, convergence (also sometimes known as the catch-up effect) can be defined as the process of poorer economies to grow with faster rates than richer economies.

As β -convergence is characterized the process in which the poor regions grow faster than the rich ones, in order to achieve a similar level of per capita GDP. As a result, a process of capital transfer from the richest economies to the poorest ones will take place creating the conditions needed for the convergence to long-term equilibrium of the GDP per capita of all economies (Barro and Sala-i-Martin, 1992; Sala-i-Martin, 1996a). The concept of β -convergence is based on the neoclassical growth theory of which a basic assumption is that factors of production are subject to diminishing return (Solow, 1956; Koopmans, 1965). The β -convergence is categorised into absolute convergence when all regions are assumed to converge (in terms of GDP per capita and growth rate) to the same steady state, and conditional convergence, when the regions with the same initial conditions achieve the same GDP per capita in the long run. The steady state may depend on the specific characteristics of each region. The value of the parameter β is calculated from the slope in the growth regression and represents the convergence rate, viz the rate that each region approaches their steady state. A well-known term of the concept of β -convergence is the “half-life”, which expresses the time span until disparities are halved. Usual values of the parameter β are around 2% (Abreu et al., 2005b, p. 390; Monfort, 2008).

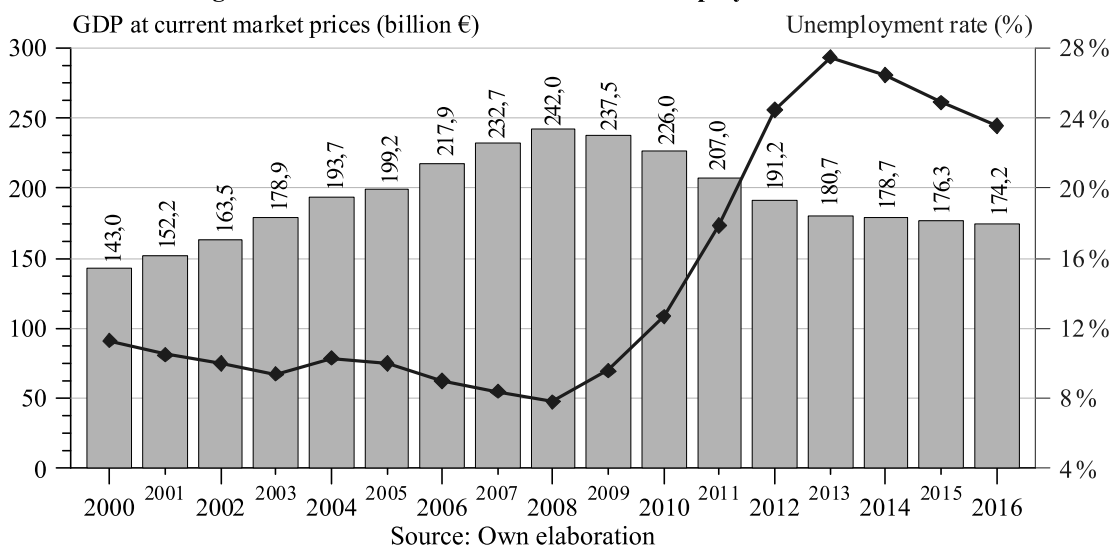
Besides the β -convergence, the σ -convergence describes the reduction of the dispersion of income levels across economies. While β -convergence focuses on catching-up process, σ -convergence refers just to the reduction of disparities among under study regions in time. Although σ -convergence only occurs if β -convergence takes place, β -convergence is necessary but not sufficient for σ -convergence (Sala-i-Martin, 1996b; Eckey and Türec, 2005). Friedman (1992) and Quah (1993) suggest that σ -convergence is more revealing of the reality than β -convergence because it speaks directly as to whether the distribution of income across economies is becoming more equitable, without relying on the estimation of a particular model (Young et al., 2008).

3. The economic crisis in Greece and the impact on GDP and unemployment rate

The term “economic crisis” is used in Greece not only for its economic point of view but also for political and social ones. The Greek economic crisis (also known as the Greek Depression) started in late 2009, triggered by the turmoil of the Great Recession of 2007-2008 and inherent structural weaknesses of the Greek economy. The crisis reached the populace as a series of sudden reforms and austerity measures that led to a loss of income and sometimes of property.

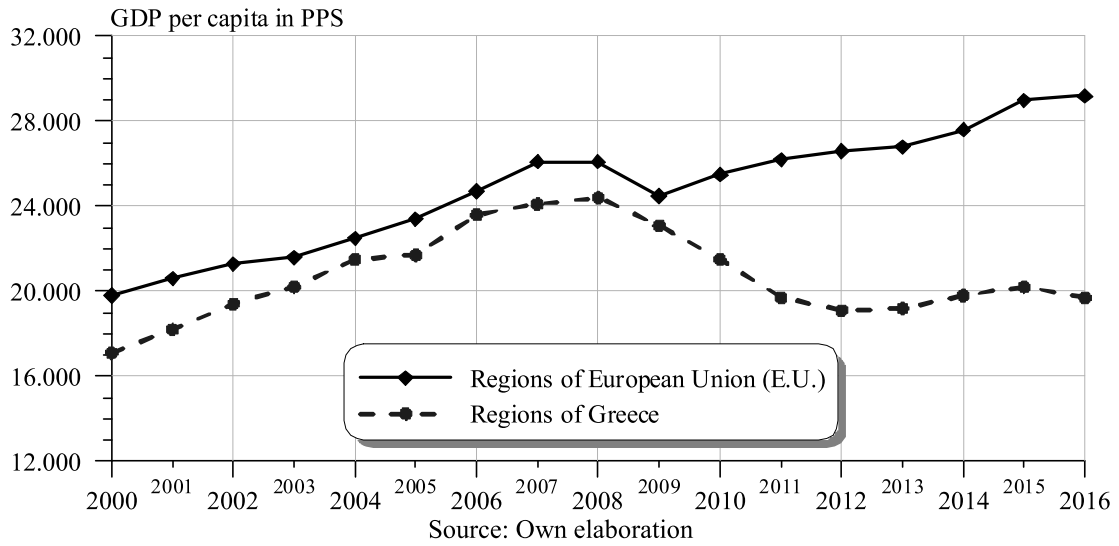
The Greek economic crisis seriously affected the economy of the country. Between the years 2008-2016, the Gross Domestic Product (GDP) at current market prices of Greece was reduced by 28% (Figure 3), compared to -8% in Spain, -6% in Portugal, -4% in Italy and -6% in the EU-28 countries. Unemployment increased in Greece from 7.8% in 2008 to 27.5% in 2013 (Figure 3), in Spain from 8.2% in 2007 to 26.1% in 2013, in Portugal from 7.7% in 2008 to 16.4% in 2013, in Italy from 6.1% in 2007 to 12.7% in 2014 and in the EU-28 countries from 7.0% in 2008 to 10.9% in 2013. Unemployment of the youth was significantly affected in Greece after the year 2008 reaching up to 50% (58.3% in 2013).

Figure 3: Evolution of Greek GDP and unemployment rate



The evolution over time of the average GDP per capita in PPS of the regions of the EU and Greece, Figure 4, reflects the convergence dynamics developed in the period 2000-2008 and the significant deviation in the period 2008-2016. It also demonstrates that while the regions of the EU recover from the economic crisis that occurred in 2008, its impact on the income of the residents of the regions of Greece continues to this day.

Figure 4: Change in GDP per capita in PPS of regions of the European Union and Greece



4. The economic crisis in Greece and the impact on convergence

To further explore the problem, the hypothesis of absolute β -convergence between the regions of the EU and Greece, is examined, using the econometric model of Barro and Sala-i-Martin (1992), which is expressed by the equation:

$$\frac{1}{T} \cdot \log \frac{Y_{i,T}}{Y_{i,0}} = \alpha + \beta \cdot \log Y_{i,0} + \varepsilon_i \quad (1)$$

Equation (1) demonstrates that the average economic growth of GDP per capita in PPS ($Y_{i,T}$ and $Y_{i,0}$) over a period of T years is equal to constant α added to a linear combination of the initial GDP per capita in PPS ($Y_{i,0}$) and the error of the equation (ε_i). Symbol i stands for the spatial units examined which are regions in the present research and β is the estimated coefficient of the equation.

Convergence is achieved when coefficient β gets a negative and statistically significant value in the estimation of the model. Absolute β -convergence suggests that there is a systematic tendency for economies with lower GDP per capita levels to grow faster than those with higher levels and yet both result in equilibrium achieved at the same point in the long run.

This paper examined the condition of absolute β -convergence with panel data, taking into account both the cross-sectional and temporal dimensions of the data. The dependent variable was represented by the average value of GDP per capita in PPS in the EU. The results deriving from the solution of the econometric convergence model for the regions of the EU and Greece are presented in Table 1 for the period 2000-2016 as a whole, as well as for the periods 2000-2008 and 2008-2016.

Table 1. Results of an econometric model of absolute convergence

Spatial unit	β -coefficient	Annual rate of convergence	Half-life (in years)
period 2000-2016			
Regions of the European Union (EU)	-0.088***	5.4%	13
Regions of Greece	0.0035***		
period 2000-2008			
Regions of the European Union (EU)	-0.189***	8.5%	6
Regions of Greece	-0.305***	15.4%	4
period 2008-2016			
Regions of the European Union (EU)	-0.041***	3.6%	19
Regions of Greece	0.380***		

Note: ***, denote statistical significance $p < 0.01$.

Source: Own elaboration

For the period 2000-2016, the evaluation of the results confirms the existence of a trend of convergence of the regions of the EU, a negative and statistically significant value of coefficient β , and for the same period, a trend of divergence of the regions of Greece, a positive and statistically significant value of coefficient β . The annual convergence speed of the EU regions is calculated using the Equation (2) of Sala-i-Martin (1996a) and is found equal to 5.4%.

$$b = \frac{-\ln(1 + T \cdot \beta)}{T} \quad (2)$$

The time τ required to halve the growth gap between the richest and the poorest regions of the EU, defined as half-life, is calculated using the Equation (3) of Sala-i-Martin (1996a) to be 13 years.

$$\tau = \frac{-\ln(2)}{\ln(1 + b)} \quad (3)$$

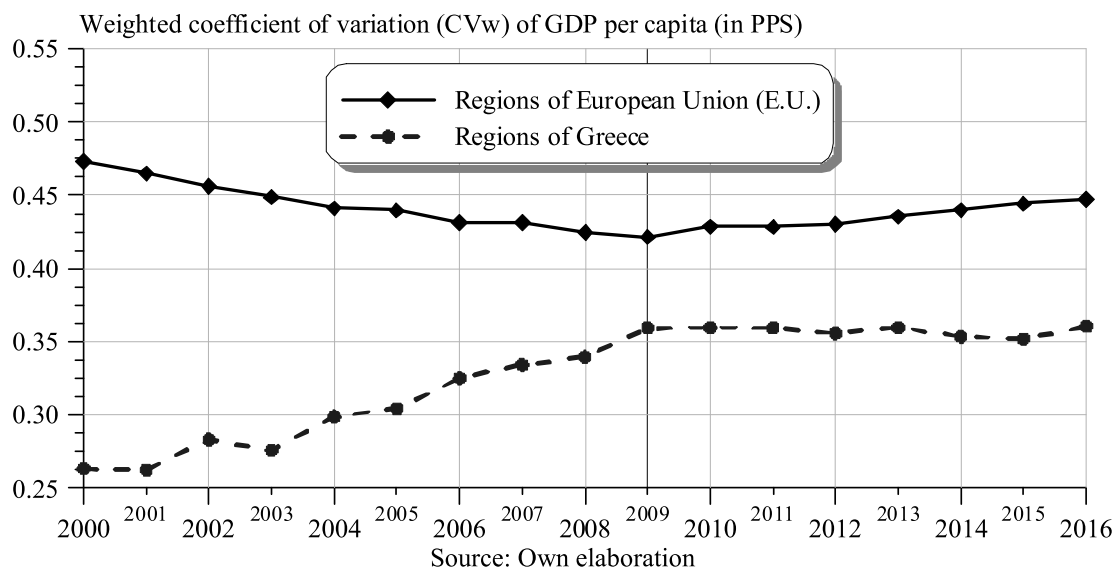
There is also a decrease in the annual rate of convergence of the EU regions from 8.5% in the period 2000-2008 to 3.6% in the period 2008-2016. Similarly, regarding the Greek regions, the significant convergence dynamics developed in the period 2000-2008 are reversed into a significant divergence trend for the period 2008-2016.

Additionally, the hypothesis of the σ -convergence of the regions of the EU and Greece is being considered. It is noted that σ -convergence examines the evolution of income distribution over time while β -convergence examines income mobility within the distribution. Thus, these two notions of convergence are considered complementary and according to the literature they should be considered together (Sala-i-Martin, 1996a).

The σ -convergence is observed in the case of a gradual decrease in the dispersion of GDP per capita in PPS of the economies under consideration. The present research employs the coefficient of variation weighed by population, which is defined as the quotient of the standard deviation with the mean value, as a measure of dispersion. The coefficient of variation expresses the standard deviation as a percentage of the mean value and thus it is a dimensionless quantity. Therefore, it is not affected by the value of the arithmetic mean.

The evolution of the weighted coefficient of variation (CVw) tends to reduce the inequalities of the regions of the EU by around 11% for the period 2000-2009, as shown in Figure 5. At the same time, the slightly upward trend presenting an increase of 4% over the period 2009-2016, confirms the claims in the literature (Friedman, 1992; Quah, 1993) according to which β -convergence is a necessary condition but not a sufficient one in our case, since the economic crisis of 2008 being a disturbance, appears to be able to increase the income dispersion of the spatial units under consideration, even if they converge at common point of a long-term equilibrium.

Figure 5: Change in the weighted Coefficient of Variation (CVw) of regions of the European Union and Greece



Similar results are presented in the 7th Report on Economic, Social and Territorial Cohesion of the European Commission (European Commission, 2017) according to which, before the economic crisis inequalities in GDP per capita shrink within the EU. The fluctuation rate is reduced by 12% over the period 2000-2008, while during the years of the crisis, from 2008 to 2014, regional disparities are slightly increased by 4%, remaining below the level they reached in 2000.

As far as the EU member states are concerned, the calculation of absolute β -convergence for the period 1995-2010, showed (Petraikos et al., 2011) the converge at an annual rate of 3.13% and half-life was found equal to 22 years. They are also reporting a trend for EU member states toward σ -convergence by reducing the dispersion of GDP per capita.

On the other hand, the inequalities of the regions of Greece in the same period (2000-2009) are significantly increased by approximately 29%, suggesting an unbalanced growth for the period 2000-2009, while the consequent steady course of the weighted coefficient of variation (CVw) till 2016 validates the claims of many researchers (Kuznets, 1955; Williamson, 1965; Capello, 2007), who argue that regional disparities follow economic cycles in the sense that they grow in times of intense grow and decliner remain stable in times of recession.

5. Conclusion

This paper shows that the dynamic path of convergence of the economy of the Greek regions that was developed in the period 2000-2008 has been fully reversed following the outbreak of the 2008 economic crisis. This tendency to deviate from the European average continues to this day. The significant impact of the economic crisis on the convergence of the economy of the Greek regions is estimated to be due, as evidenced by the significant increase in regional disparities in the period 2000-2008, to the unbalanced growth observed in the period 2000-2008. As far as the regions of the European Union (EU) is concerned, the results of both absolute β -convergence and σ -convergence suggest a declining trend of convergence and persistence of inequalities for the regions of the EU, following the outbreak of the 2008 economic crisis.

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