# Laggards or performers? CEE vs. PIIGS countries' catch-up with the Euro area in the last ten years

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# Laggards or performers? CEE vs. PIIGS countries' catch-up with the Euro area in the last ten years

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**Abstract**

*This research paper develops a comparative analysis between the new members states of the European Union (EU) – from Central and Eastern Europe (CEE) – and PIIGS countries (Portugal, Italy, Ireland, Greece and Spain) in terms of economic convergence with the Euro area, in the last decade. In addition, the paper emphasizes the changes in the economic convergence levels determined by the recent international crisis. In order to assess these evolutions, we compute an aggregated index of economic convergence, made up of real and structural convergence indexes. Then, by using cluster methodology, we highlight the similarities between the states in the two groups, CEE and PIIGS, from the economic convergence perspective. The comparative analysis reveals that in 2010 only Estonia, Hungary and Slovenia report resembling characteristics to PIIGS group. We also report an important progress of the countries analyzed, as regards real and structural convergence with the Euro area. However, after a decade of catching-up, Romania remains by far the most distanced country from the Euro area.*

**JEL classification**: F15, F43, C43, C38

**Keywords**: real convergence, structural convergence, Central and Eastern Europe, PIIGS, clusterization

## 1. Introduction

The experience of previous EU accession waves shows that the "catching-up" process takes a lot of time and continues long after the accession moment. A relevant example is represented by PIIGS countries which, despite becoming EU members long before CEE countries, they did not all succeed in catching up with the Euro area so far.  Indeed, PIIGS countries are not directly comparable to CEE countries, taking into consideration their economic initial conditions and their different economic structures, but it is interesting that, after many years of Economic and Monetary Union (EMU), they still have not attained the Euro area average. The experience of these states suggests that CEE countries

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that have entered the EU having even lower real income levels, will have a long way to go in the process of convergence with the Euro area.

The last two accession waves to the EU brought in new countries that are considered peripheral in comparison with the Euro area, as regards economic convergence. It is clear that this led to major disparities creation in the economic development level within the Union.

EU accession is not the final stage in the European integration process, but an intermediary step to obtain EMU membership. CEE countries do not benefit from an "opt-out" clause, as United Kingdom and Denmark do, which is why they are required to make efforts in order achieve nominal convergence criteria with a view to adopting the Euro. So far, only three CEE countries joined the Euro area, namely Estonia, Slovenia and Slovakia. Adopting the single currency remains the main challenge that Bulgaria, Czech Republic, Latvia, Lithuania, Poland, Romania and Hungary are facing in the European integration process.

Fulfillment of nominal convergence criteria is mandatory for EMU accession. However, attaining a certain level of real and structural convergence is not mentioned as pre-condition accession. The importance of economic convergence is not negligible, taking into consideration that its absence leads to higher costs of adopting the single currency.

A lot of research papers have studied the process of economic catch-up of CEE countries and of cohesion countries, Portugal, Ireland, Greece and Spain. This term, cohesion countries, comes from the position of these states at the periphery of EU core, mainly because of the low income per inhabitant levels, as compared to the EU and Euro area.

During the recent economic crisis, the vulnerabilities of cohesion countries have become even more obvious. The sovereign debt crisis continues to shake the foundations of the Euro area and the confidence in the Monetary Union. Portugal, Greece and Ireland have received financial assistance from the IMF and EU. However, the situation remains uncertain.

Italy joined the PIGS group because of economic and financial challenges similar to those of the group, public debt and budgetary deficit being just one aspect of the problem. At the moment, PIIGS are the most troubled economies in the Euro area. Apart from fiscal problems, they face difficulties in terms of employment and productivity. The Euro turned out to be both a blessing and a curse for these countries.

This paper examines on the one hand, the evolution of economic convergence with the Euro area in the last decade through and aggregate economic convergence index, and on the other hand, the similarities of the economies in the two groups, CEE and PIIGS, through clusterization. In addition, we will analyze the last three years to highlight the effects of the international crisis on the degree of economic convergence.

The paper is organized as follows: in Section 2 we present a synthesis of the economic literature, in Section 3 and 4 we elaborate on the research methods and data analysis and in Section 5 we detail the research results. The last Section summarizes the conclusions of this study.

## 2. Literature review

A lot of previous research papers concentrated on the analysis of either real or structural convergence.

Real convergence, mainly expressed through convergence of income levels, was studied by Galor (1996), who defined three major hypotheses regarding convergence: absolute convergence hypothesis, conditional convergence hypothesis and convergence clubs hypothesis. The present article employs the first hypothesis which makes reference to long term income per inhabitant convergence, regardless of the analyzed countries' initial conditions.

The most popular quantitative definitions of convergence are β, respectively σ convergence. β convergence means higher growth rates for less developed countries and lower growth rates for developed ones. σ convergence refers to income dispersion reduction within a group of countries.

In a recent paper, Spruk (2011) examines the dynamics of income per capita convergence in high-income transition countries from Central Europe (Czech Republic, Croatia, Estonia, Hungary, Poland, Slovakia and Slovenia) in the period 1991-2007, on the basis of β convergence model. The main conclusion is that human capital has a major contribution to the real convergence speed growth.

Miron, Dima and Păun (2009) conducted a complex study on CEE countries regarding their real convergence with the Euro area between 1999 and 2007, on the basis of several economic indicators, showing that Poland and Czech Republic have been the most successful in approaching the Euro area in terms of real convergence.

A previous analysis by Próchniak and Matkowski (2004) focuses on income and cyclical convergence of CEE countries during 1993-2004. The main result emphasizes the convergence and synchronization between countries and with the EU in terms of income.

Recent research papers on structural convergence have concentrated on its influence on business cycles synchronization. This is important for the way national economies react to economic shocks transmitted through monetary policy of EMU.

Structural convergence analyses, on the basis of Gross Domestic Product (GDP) structure are quite numerous. According to the Monetary Policy Committee task force of the European Central Bank (2004), the composition of GDP by economic sectors is relevant to the monetary policy, due to its influence on the external shocks transmission mechanisms.

Angeloni *et al.* (2005) consider that GDP composition is an important indicator for structural convergence and a benchmark for assessing the stage of economic development of a country. Following Krugman's methodology (1991), the above authors compute a structural divergence index in order to emphasize the convergence of new EU member states with the Euro area. Von Hagen and Trăistaru (2005) compute a dissimilarity index for the same purpose.

Darvas and Szapary (2004) conducted an empirical analysis of the evolution of industrial production structure in Hungary, Poland and Slovenia and noticed a high correlation degree with the Euro area.

Bojesteanu and Bobeica (2008), by analyzing business cycles synchronization in EU new member states and Euro area, demonstrate the existence of an increasing structural convergence of all states, with the exception of Estonia, Lithuania, Slovakia and Romania.

The relation between real and structural convergence was analyzed by Barrios, Barry and Strobl (2002) in the four cohesion countries: Greece, Spain, Portugal and Ireland. They come to the conclusion that there is a correlation between structural convergence and income convergence.

Barry (2003) compares economic achievements of cohesion countries during 1960-200, in order to identify the processes that led to real convergence growth over time, starting from labor-market performance, macroeconomic stability and microeconomic policies.

Varblane and Vahter (2005) make a comparative analysis of new member states real convergence (including accession countries at that date, Romania and Bulgaria) and of cohesion countries with the EU during 1995-2004, coming to the conclusion that CEE countries have been more successful in reaching real convergence with the EU before accession.

Comparative studies between the two groups of countries, CEE and PIIGS, are relatively limited in number. The current paper extends the research area, by making a comprehensive analysis of real and structural convergence, through their aggregation into an economic convergence index. In addition, the similarities between these two groups are highlighted by clusterization. The period of time taken into consideration allows for stressing the changes at economic convergence level with the Euro area during the economic and financial crisis.

## 3. Research methodology

The paper uses a quantitative analysis in order to determine the degree of convergence of analyzed countries with the Euro area, by creating an economic convergence index (ECI). The economic convergence index built in this paper is made up of two equal parts: real convergence index (RCI) and structural convergence index (SCI).

RCI comprises 3 sub-indicators: GDP per capita at purchasing power parity (PPP), labor productivity per person employed and price convergence, as percentage of the Euro area average. Each sub-indicator has values, in general, between 0 and 100, expressing the distance from the Euro area, as follows: 0 means absence of convergence with the Euro area, while 100 means total convergence with the Euro area average. Values above 100 point to levels higher than the Euro area.

GDP per capita at PPP is calculated in relation to the Euro area average, which is set to equal 100. If this sub-indicator is higher than 100, the level of GDP per head is higher than Euro area average. If this sub-indicator is lower than 100, the level of GDP per head in that country is lower than Euro area average. By expressing the figures at PPP, the differences in price levels between countries are eliminated, allowing meaningful comparisons between countries' GDP per capita.

Labor productivity per person employed gives an overall landscape of that country's productivity, in relation to the Euro area average. A value lower than 100 means a lower labor productivity than the Euro area average, while a value higher than 100 expresses a higher labor productivity level as compared to the Euro area average.

Price convergence is expressed through comparisons between final consumption price levels paid by households. Levels above 100 mean price levels above the Euro area average and levels below 100 mean low convergence with the Euro area average.

In order to create the RCI, we founded our approach on the research methodology used by the Group of Applied Economics (GEA) in the handbook for assessing the regional competitiveness of Romania, which was published in 2007. GEA researchers created a competitiveness index by computing the weighted average of economic, social and technological indicators, the shares being established according to the results obtained by a focus group of GEA experts.

RCI is computed as a weigthed average of indicators described above. The highest share, of 50%, is given to the labor productivity per person employed, according to the highest share employed by GEA in computing the economic indicator. GDP per capita and price convergence receive equal shares of 25% each. These are equally important, because they express productivity and nominal convergence with the Euro area. Even in the GEA study, GDP per head has a lower share as compared to labor productivity.

The RCI index is computed as follows:

$$\textbf{RCI}_{i,EA} = \frac{\textbf{GDP}}{\textbf{inhab.}} \times \textbf{0.25} + \textbf{Labor productivity} \times \textbf{0.5} + \textbf{P convergence} \times \textbf{0.25,}\ \text{where}$$

RCI $_{i,EA}$ – real convergence index of country $i$ with the Euro area, and the indicators are those described above.

In order to compute the SCI, we have chosen gross value added (GVA) as a unit of analysis of the activity level, because it captures the overall importance of the economic activity in a country. The structural convergence index is based on 6 main economic sectors, corresponding to NACE-A6 classification: agriculture, industry, constructions, trade, financial services and other services[3]. The gross value added of each sector is defined as share of the gross value added in the whole economy.

In this paper, we use index of structural divergence proposed by Krugman in 1991 and previously used in many other studies (Clark and van Wincoop, 2001; Imbs, 2004; Trăistaru, 2005 etc.) for

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[3] The six sectors, according to Eurostat are: Agriculture, hunting and fishing, Industry, including Energy, Constructions, Trade, transports and communication services, Financial business and services, Other services.

computing the SCI. The structural divergence index was developed in order to measure the degree of specialization that a country has in relation to other country or a group of countries. This is computed as the sum of absolute differences between the share of each sector in the economy analyzed and the share of each sector in the Euro area (as average). The SCI shows that a state is more similar to the Euro zone, as this index is closer to 100.

$$\mathbf{SCI_{i,EA}} = \mathbf{1} - \sum_{k=1}^{K} \mathbf{abs}\,(\mathbf{S_{k,i}} - \mathbf{S_{k,EA}})\text{ , where}$$

SCI $_{i,EA}$ – index of structural convergence with the Euro area;

K – number of sectors taken into account;

$S_{k,i}$ – share of the gross value added of k sector in the total gross value added of country $i$;

$S_{k,EA}$ – share of gross value added of k sector in the total gross value added of Euro area.

As a consequence, ECI is computed as follows:

$$\mathbf{ECI_{i,EA}} = \mathbf{0.5} \times \mathbf{SCI_{i,EA}} + \mathbf{0.5} \times \mathbf{RCI_{i,EA}}$$

The approach for emphasizing the degree of similarity between the analyzed states as regards their level of real convergence is based on clusterization. This method of analysis groups together in clusters countries with similar ECI.

In this study we use non-hierarchical clustering algorithms, founded on k-means method. This clustering method is based on the model of McQueen (1967). The algorithm implies grouping countries in k sub-sets (clusters), apriori fixed, and represented by their gravity centers (centroids). So, the first step in this algorithm is choosing the number of clusters, afterwards for each of these k sub-sets k centroids are set up. Then, every country is attached to the closest center and the countries attached to one center make up a cluster. The center of each cluster is updated in relation to the countries included in it. The algorithm goes on until centers do not change any more. The objective function is:

$$\mathbf{J} = \sum_{j=1}^{k}\sum_{i=1}^{n}\lVert \mathbf{x_i} - \mathbf{c_j}\rVert^{\mathbf{2}}\text{ , where}$$

$\lVert x_i - c_j \rVert^2$ – distance between a country $x_i$ and the cluster center;

$c_j$ – indicator of the distance of the $n$ countries from their respective cluster centers.

In this analysis, we employ data regarding 15 European Union member states (10 CEE countries and 5 PIIGS countries). The number of clusters – k – was set to 4, taking into consideration the number of states included in the study. This way we could determine the similarities and the relationships between Central and Eastern European countries, PIIGS countries and Euro area average in the last decade, but also the effect that the crisis period 2008 – 2010 had on the grouping of these countries in terms of ECI.

The clusterization method is computed in SPSS soft.


## 4. Data analysis

The data used in the paper come from the Eurostat database. In order to compute the SCI, the gross value added of each economic sector is related to the Euro area average, which is calculated by Eurostat. As regards the RCI, the data for each country were related to the Euro area average, set up to equal 100.

The data cover the years 2000, 2008 and 2010 in order to analyze the process of economic convergence in the last decade, the similarities between the two groups of countries and the impact of the international crisis on economic convergence. Consequently, we review two periods: 2000-2010, to highlight the achievements in terms of economic convergence of the 15 countries in the last decade, respectively 2008-2010, to emphasize the effects of the economic and financial crisis on the level of economic convergence with the Euro area.

In the last ten years, the CEE countries made considerable progress in the process of convergence with the Euro area. However, GDP per inhabitant remain well below the Euro area average. The only country in PIIGS group that faces this common problem of the CEE states is Portugal, which could not

exceed 75% GDP/capita of the Euro area. In this respect, Ireland has the best performance, having exceeded the Euro area average at GDP/capita by approximately 18 percentage points (pp).

The differences between CEE countries and the Euro zone stem from a greater share of industry and trade and, to a certain extent, now lesser, of agriculture in CEE countries, at the expense of services sector (others than trade).

CEE countries, even though they have diminished the importance of agriculture in the national economy, still have relatively high shares of this sector as compared to other EMU countries. Only Czech Republic and Slovenia currently have shares of agriculture equal to the Euro area average. In the case of PIIGS countries, Greece remains the unique country with a significant higher dimension of agriculture compared to the Euro area average.

## 5. Results

### 5.1. The economic convergence index

When computing the economic convergence index, we can observe the heterogeneous character of ECI within each group of states, but also overall, at the level of the 15 countries analyzed.

Table no. 1    Reducing economic convergence disparities with the Euro area

| Countries | Economic Convergence Index | | | Reducing the gap with the Euro area | |
|---|---|---|---|---|---|
| | 2000 | 2008 | 2010 | 2000-2008 | 2000-2010 |
| Bulgaria | 51.0 | 56.9 | 57.3 | 5.9 | 6.3 |
| Czech Republic | 60.9 | 68.0 | 67.0 | 7.1 | 6.2 |
| Estonia | 62.8 | 73.9 | 71.8 | 11.1 | 9.0 |
| Latvia | 56.3 | 64.6 | 64.8 | 8.3 | 8.6 |
| Lithuania | 55.3 | 61.9 | 60.5 | 6.6 | 5.2 |
| Hungary | 67.9 | 74.3 | 71.7 | 6.4 | 3.7 |
| Poland | 62.1 | 66.3 | 64.1 | 4.2 | 2.0 |
| Romania | 44.1 | 52.7 | 49.7 | 8.6 | 5.6 |
| Slovenia | 76.1 | 79.5 | 80.0 | 3.4 | 3.9 |
| Slovakia | **59.4** | 66.2 | 70.0 | **6.8** | **10.6** |
| Portugal | 77 | 78.7 | 79.9 | 1.6 | 2.8 |
| Italy | 98.9 | 97.4 | 96.2 | -1.5 | -2.7 |
| Ireland | **93.2** | 105.0 | 102.7 | **11.7** | **9.5** |
| Greece | 76 | 77.1 | 78.4 | 1.1 | 2.4 |
| Spain | 84.7 | 87.6 | 88.7 | 2.9 | 4.0 |

Source: Authors' work

The only country which recorded a lower level of economic convergence in 2010 as compared to 2000 is Italy, which lost 2.7 pp. The negative evolution was due to real convergence, which decreased by approximately 10 pp in the last decade and which cancelled the increase of 3.9 pp recorded at the level of structural convergence.

The rest of the PIIGS states had positive evolutions in the last 10 years. The economic convergence index increased by values between 2.4 pp and 9.5 pp. Ireland made the biggest progress, by catching-up 9.5 pp from the gap with the Euro area. Before the economic crisis, in 2008, Ireland was the only country with an ECI over 100 pp, position the country maintained in even in 2010, despite

losing 2.3 pp in the last 3 years. Ireland remains the performer (the country with the highest ECI) of the PIIGS group, with an ECI over 100 pp.

CEE countries have been catching-up, without exception, with the Euro area as regards economic convergence, the ECI increases being between 2 pp (Poland) and 10.6 pp (Slovakia).

Ireland counterpart in the CEE countries is Slovenia, being the performer of this group. The economic performance of Slovenia in the last decade, relative to the Euro area, was due to real convergence (7.3 pp catch-up). Structural convergence increased modestly, by 0.4 pp.

The moderate rhythm of catching-up of Slovenia in the last 10 years did not influence its top position within CEE countries. Slovenia remains the country with the highest ECI. The laggard of this group is Romania, which, even though it registered a 5.6 pp progress in the last 10 years, is still the country with the lowest performance in terms of economic convergence, having an ECI of just 49.7 pp and being followed by Bulgaria, at great distance (57.3 pp).

Romania's catching-up with the Euro area was entirely due to real convergence, which compensated for the structural convergence deficit. Thus, in the last decade, the structure of the Romanian economy has been distancing from that of the Euro area, reaching 53 pp in 2010 as compared to 61.2 pp in 2000, due to large share of agriculture relative to the Euro area. By contrast, real convergence recorded an important advance, from 27 pp to 46.3 pp in the last 10 years, based on double labor productivity and a significant increase in the GDP/head.

The graphical analysis of the results shows that evolutions of the economic convergence in the last decade did not change significantly the positioning of these countries on the map of economic catch-up. Within the two groups, Slovenia and Portugal present the smallest distance between ECI in 2010. Romania, despite having reduced the divergence degree with the Euro area, is still placed lower than other CEE countries.

Figure no.1    Map of economic catch-up in the last decade

**Economic Convergence Index 2000-2010**
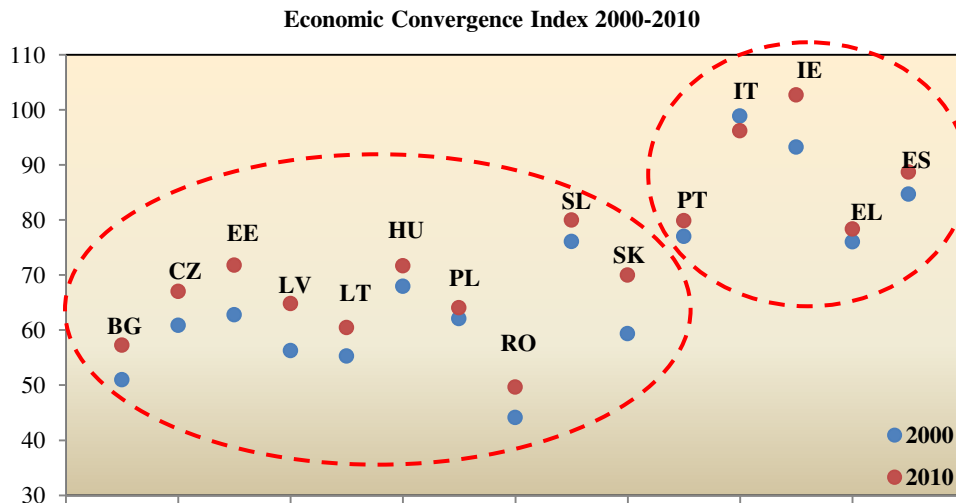


Source: Authors' work

During the three years of crisis covered by the paper, 7 of the analyzed countries succeeded in reducing the divergence degree with the Euro area (Bulgaria, Latvia, Slovakia, Slovenia, Portugal, Greece and Spain). We can notice that only 4 state in the CEE group recorded positive evolutions during the economic crisis period. Within the PIIGS group, the two countries with negative evolutions of the economic convergence index were Italy and Ireland. During this period, Romania became even more distanced from the other states and, of course, from the Euro area.

Figura nr.2    Map of economic catch-up during economic crisis period



**Economic Convergence Index 2008-2010**

Source: Authors' work
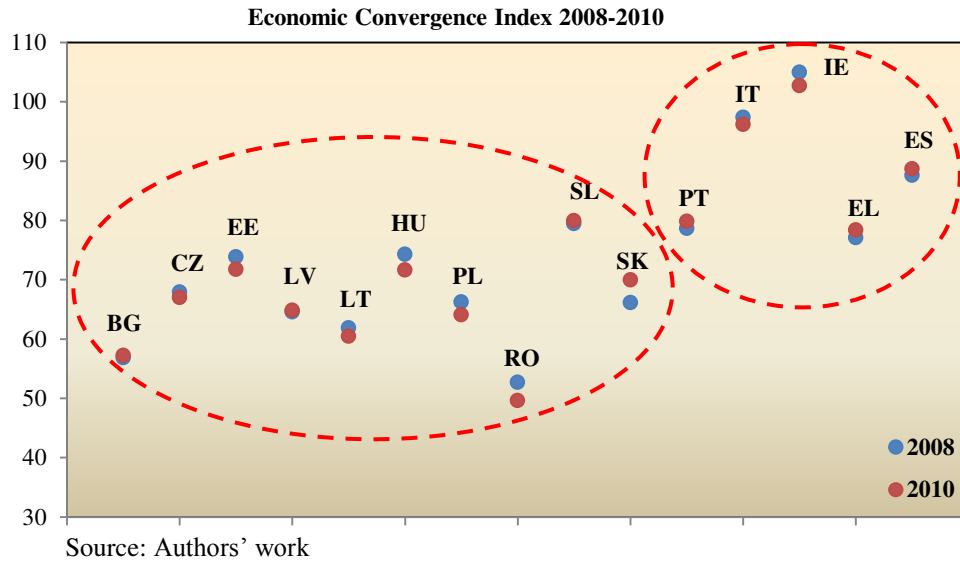
### 5.2. Economic convergence clusters

The results obtained after processing data in SPSS are presented in the tables below, which emphasize the similarities between the analyzed states regarding their economic convergence.

The 15 states are grouped in 4 clusters in ascending order, so that cluster 1 comprises countries with the lowest performances in terms of economic convergence, while cluster 4 gathers countries with the highest levels of ECI.

In the year 2000, Bulgaria and Romania were the countries with the lowest economic convergence with the Euro area, being the only ones included in cluster 1. The center of the cluster, of just 47.6, highlights that the two of them stood at about halfway from the Euro area. Cluster 2 gathers the rest of the CEE countries, with the exception of Slovenia. Due to similarities with three states from the PIIGS group (Portugal, Greece and Spain), Slovenia was included in this cluster. The only countries with the highest economic convergence level were comprised in cluster 4 were Italy and Ireland.

During 2000-2008, Estonia and Hungary recorded an economic performance period, by accelerating the convergence process and by moving to cluster 3 in 2008, one step closer to the performers in cluster 4. Romania and Bulgaria remained the most divergent countries with the Euro area, despite important catch-up (the center of the cluster moved from 47.6 to 54.8). Over the eight years, the centers of the clusters have approached the Euro area average, with the exception of cluster 3 which maintained the center at 78.5. Italy and Ireland maintained their leading positions, with best performances in terms of economic convergence.

Table no.2        Clusters by Economic Convergence Index, 2000

| Cluster 1 | Cluster 2 | Cluster 3 | Cluster 4 |
|---|---|---|---|
| **Romania**<br>Bulgaria | Czech Republic<br>Latvia<br>Lithuania<br>Poland<br>Slovakia<br>Estonia<br>Hungary | Slovenia<br>Portugal<br>Greece<br>Spain | Italy<br>Ireland |
| **Center 47.6** | **Center  60.7** | **Center 78.5** | **Center 96.1** |

Source: Authors' work

Table no.3        Clusters by Economic Convergence Index, 2008

| Cluster 1 | Cluster 2 | Cluster 3 | Cluster 4 |
|---|---|---|---|
| **Romania**<br>Bulgaria | Czech Republic<br>Latvia<br>Lithuania<br>Poland<br>Slovakia | Estonia<br>Hungary<br>Slovenia<br>Portugal<br>Greece<br>Spain | Italy<br>Ireland |
| **Center 54.8** | **Center 65.4** | **Center 78.5** | **Center 101.2** |

Source: Authors' work

Table no.4        Clusters by Economic Convergence Index, 2010

| Cluster 1 | Cluster 2 | Cluster 3 | Cluster 4 |
|---|---|---|---|
| **Romania** | Bulgaria<br>Czech Republic<br>Latvia<br>Lithuania<br>Poland<br>Slovakia | Estonia<br>Hungary<br>Slovenia<br>Portugal<br>Greece<br>Spain | Italy<br>Ireland |
| **Center 49.7** | **Center 64.0** | **Center 78.4** | **Center 99.5** |

Source: Authors' work

The effects of the economic crisis are easily noticeable from the dynamics of clusters during 2008-2010, through the higher distances between centers and Euro area average. The only country with outstanding performance making it possible to advance to a better cluster was Bulgaria, that passed from cluster 1 to cluster 2. Thus, Bulgaria joined Czech Republic, Latvia, Lithuania, Poland and Slovakia in cluster 2, with a center equal to 64. Romania remained by far the most divergent economy from the Euro area. The moderate catch-up in the last decade was not sufficient so that Romania could advance, together with Bulgaria, to cluster 2.

At the end of a decade, Italy and Ireland proved to be the closest economies to the Euro area in terms of economic convergence, as part of cluster 4 throughout the analyzed period. But the crisis did not passed by these two states. The center of the cluster has shifted during the three years of crisis from a value that was above the Euro area average to a value below the Euro area average.

## 6. Conclusions

The current paper shows that all countries in the two groups, CEE and PIIGS, except for Italy, have made important progress in the process of "catching-up" in the last decade, the most accelerated rhythms being recorded by Slovakia and Ireland. In 2010, Slovenia had the highest level of economic convergence with the Euro area, its counterpart in PIIGS being Ireland.

The only states with high performances that made it possible for them to advance to clusters closer to the Euro area were Estonia, Hungary and Bulgaria. These are the three CEE countries similar from the economic convergence perspective with the PIIGS states.

If at the beginning of the period, Romania and Bulgaria were placed in the same cluster by the economic similarities, at the end of the 10 years, Bulgaria ends up being more distanced from Romania and having regained from the economic convergence gap with the others CEE countries that entered the EU in 2004.

The high degree of economic convergence with the Euro area in the case of Italy and Ireland maintains them in the same cluster throughout the period.

In our future research paper, we intend to determine the number of years required to achieve the Euro area average, based on indicators analyzed in this paper. We will pay particular attention to the CEE countries "catch-up" process.

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Annex no.1 **Economic Convergence Index**

| | 2000 | | | 2008 | | | 2010 | | |
|---|---|---|---|---|---|---|---|---|---|
| | SCI | RCI | ECI | SCI | RCI | ECI | SCI | RCI | ECI |
| **Bulgaria** | 72.1 | 29.9 | 51.0 | 73.8 | 40.0 | 56.9 | 73.1 | 41.4 | 57.3 |
| **Czech Republic** | 66.5 | 55.2 | 60.9 | 66.4 | 69.5 | 68.0 | 65.2 | 68.9 | 67.0 |
| **Estonia** | 80.2 | 45.4 | 62.8 | 82.9 | 64.9 | 73.9 | 78.8 | 64.7 | 71.8 |
| **Latvia** | 71.9 | 40.6 | 56.3 | 74.5 | 54.7 | 64.6 | 75.7 | 54.0 | 64.8 |
| **Lithuania** | 69.5 | 41.1 | 55.3 | 65.4 | 58.4 | 61.9 | 63.3 | 57.7 | 60.5 |
| **Hungary** | 85.3 | 50.6 | 67.9 | 83.8 | 64.8 | 74.3 | 80.1 | 63.3 | 71.7 |
| **Poland** | 74.2 | 50.0 | 62.1 | 74.3 | 58.3 | 66.3 | 68.1 | 60.1 | 64.1 |
| **Romania** | 61.2 | 27.0 | 44.1 | 56.9 | 48.5 | 52.7 | 53.0 | 46.3 | 49.7 |
| **Slovenia** | 82.1 | 70.1 | 76.1 | 79.5 | 79.5 | 79.5 | 82.5 | 77.4 | 80.0 |
| **Slovakia** | 70.4 | 48.3 | 59.4 | 62.2 | 70.1 | 66.2 | 67.7 | 72.3 | 70.0 |
| **Portugal** | 83.1 | 71.0 | 77.0 | 84.4 | 73.0 | 78.7 | 84.4 | 75.4 | 79.9 |
| **Italy** | 90.6 | 107.1 | 98.9 | 94.3 | 100.4 | 97.4 | 94.5 | 97.9 | 96.2 |
| **Ireland** | 70.5 | 116.0 | 93.2 | 89.0 | 121.0 | 105.0 | 84.7 | 120.7 | 102.7 |
| **Greece** | 70.0 | 82.1 | 76.0 | 64.4 | 89.8 | 77.1 | 69.1 | 87.7 | 78.4 |
| **Spain** | 79.9 | 89.5 | 84.7 | 80.3 | 95.0 | 87.6 | 80.0 | 97.5 | 88.7 |

Source: Authors' work