How Does Economic Crisis Change the Landscape of Real Convergence for Central and Eastern Europe?

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ABSTRACT

The paper aims at analyzing the impact of the recent economic crisis on the real convergence with the Euro area for ten countries from Central and Eastern Europe that joined the European Union in 2004 and 2007. We use 2000, 2008 and 2010 as benchmark years for our study and GDP per capita at PPP, as the most relevant indicator in terms of real convergence. The study is based on Euclidian distance analysis. The results reveal that most of the countries recorded higher distances from the Euro area average, while Poland and Slovakia improved their convergence.

Keywords: Real convergence, Euclidian distances, Central and Eastern Europe, Euro area

JEL codes: F15, F43, C82

1.Introduction

The literature on economic growth and development has paid a lot of attention to poor countries or regions that succeed in growing faster than rich countries or regions. This research theme becomes even more interesting when looking at the European integration process. Starting with 2004, two important accession waves to the European Union (EU) took place, with ten countries from Central and Eastern Europe (CEE) receiving the EU membership: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia and Slovakia. It is quite clear that this led to the creation of major disparities in the economic development levels within EU.

EU membership should not be regarded as a final step for these countries. This is, in fact, an intermediary step towards Economic and Monetary Union (EMU) membership. Up until now, three countries out of those ten which entered the EU succeeded in becoming also members of the Euro area. Those are: Slovenia in 2007, Slovakia in 2009 and Estonia in 2011.

CEE countries do not benefit from an opt – out clause, like UK or Denmark[1], as a consequence all of them have to make efforts to gain the EMU membership. In contrast to the compulsory observation of nominal convergence criteria, Euro area accession does not require observation of real convergence conditions. However, this is equally important, as the costs of adopting the euro will be lower in case of a higher degree of real convergence homogeneity. Consequently, the current analysis concentrates on real convergence of the CEE countries, regardless of their EMU membership, with the Euro area.

The purpose of this research is to analyze the changes brought about by the current economic crisis in terms of real convergence with the Euro area of CEE countries. The study employs Gross Domestic Product (GDP) per capita at purchasing power parity (PPP) as relevant indicator of the real convergence and a distance-based analysis in order to assess the evolution of distances from the Euro area in 2000, 2008 and in 2010.

The paper is organized as follows. In section 2 a review is made regarding the related literature on real convergence. Section 3 details the research methodology used in this study. Section 4 presents the data used in the analysis. Section 5 presents the results of this research and section 6 concludes.

2. Related Literature

The issue of real convergence has received a lot of attention in the literature. Van de Coevering (2003) defines real convergence as a process which includes two important parts: the tendency of equalization of incomes and development levels and the tendency to attain a certain degree of similarity of business cycles, which is structural (or cyclical) convergence. In this paper, the first part of the real convergence definition is used, more exactly, the income convergence.

Galor (1996) formulated three major hypotheses regarding convergence: the absolute (unconditional) convergence hypothesis, the conditional convergence hypothesis and the convergence clubs hypothesis. Absolute convergence refers to long term convergence of income per inhabitant between countries, regardless of their initial conditions. Conditional convergence refers to income per inhabitant convergence between countries with identical fundamental structures, irrespective of their initial conditions. The convergence clubs hypothesis is similar to the conditional convergence hypothesis, but unlike this, it requires the same initial conditions of countries. The convergence term received two main quantitative definitions in the literature: β

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[1] According to the European Commission, only UK and Denmark appear to have an opt-out clause. Please note that in the case of Sweden, it has not yet qualified to be part of the Euro area. It has derogation like the other non-EMU countries that do not fulfill yet the criteria. In fact, there is a special situation in Sweden: the referendum made several years ago stated that people do not want the Euro. But Sweden does not have an opt-out clause. Please see the information provided by the EC at this address: http://ec.europa.eu/economy_finance/euro/adoption/euro_area/index_en.htm

convergence and σ convergence. β convergence refers to the higher growth rates that poor countries or regions have compared to rich countries or regions and it is tested by regressing the GDP per inhabitant growth on its initial level. σ convergence refers to the reduction of the GDP per inhabitant dispersion within a group of countries (regions).

Miron, Dima and Păun (2009) conducted a comprehensive study on CEE countries, which had not introduced the Euro at that time, regarding their real convergence with the Eurozone. They used several indicators for defining real convergence: GDP growth rate, GDP per capita, exports to GDP, foreign direct investments intensity, stock market capitalization, unemployment rate, labor cost, R&D expenditures made by private sector. The study covered 9 years, from 1999 until 2007. According to their analysis, Poland and Czech Republic had been the most successful in approaching the Euro area.

Próchniak and Matkowski (2004) analyzed two aspects of income and cyclical convergence in CEE countries during 1993 – 2004. They came to the conclusion that CEE countries converge between themselves and towards the EU as regards the income level and that these countries synchronize well with the European Union. Both income and cyclical convergence seem to be very affected by the dependence on the EU markets.

Salsecci and Pesce (2008) studied the drivers of economic growth and real convergence in CEE and SEE (South-East Europe) countries during 2002-2006. They reported that both economic growth and real convergence are led by capital accumulation and total factor productivity dynamics, but the most important seems to be the latter one.

The current research contributes to the existing literature by making and assessment of the evolution of real convergence of CEE countries, also EU members, with the Euro area during the recent economic crisis and by employing a distance-based approach to analyze the new convergence landscape.

3. Research Methodology

In this quantitative study, a specific measure of β convergence is used based on distances between individual countries. There are a lot of methods to compute the distances between two points in a multidimensional space, but in this study we employ Euclidian distances, based on rescaled data between 0 and 1. All distance measures depend on the measurement units of variables and are influenced by the variables that have high values. This is why standardized data, between 0 and 1, were used in this analysis. The distance – based analysis represents an important part in the cluster analysis.

Euclidian distance measures the smallest distance between two points, i and j, in a multidimensional space, being equal to the length of the line that joins the two points. In a multidimensional space, the Euclidian distance represents the distance between 2 points A(x1,

y1) and B (x2, y2), which is obtained by applying the Pythagora's theorem. Hence, the distance is described by equation (1):

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \quad (1)$$

A value closer to 1 means a low convergence level with the Euro area or a great distance from the Euro area level. A value closer to 0 means a high convergence level with the Euro area or a small distance from the Euro area level. An increase in the value of the distance is equivalent to saying that the respective country records a lower convergence level with the Euro area.

The variable used for assessing the level of real convergence is GDP per capita at PPP. Using GDP per capita at PPP, the differences in price levels between countries are eliminated, allowing meaningful comparisons between countries' GDP per capita. This indicator is computed as number between 0 and 100. It is expressed in relation to the Euro area average, which in turn relates to the European Union average set to equal 100. On the one hand, if the indicator of a country is growing and approaching the Euro area average, the country's level of GDP per capita is converging with that of the Euro area average. On the other hand, if this indicator records decreasing values and is distancing from the Euro area average, the country's level of GDP per capita is diverging with that of the Euro area average. The Euclidian distances have been computed for each CEE country included in this study in the following years: 2000, 2008 and 2010, for GDP per capita variable. The data have been processed in a statistical software, Statistical Package for the Social Sciences (SPSS version 17.0).

4. Data Analysis

The study uses data for GDP per capita at PPP in 2000, 2008 and 2010, obtaining important conclusions concerning the evolution of real convergence during the recent economic crisis. The data is extracted from Eurostat database. The Euro area average and the EU average taken into consideration are calculated by Eurostat. The results are presented in the Table 1:

Table 1   GDP per capita at PPP in Central and Eastern European countries

Country / Year	2000	2008	2010
Bulgaria	28	43	43
Czech Republic	68	81	80
Estonia	45	68	65
Latvia	37	56	52
Lithuania	39	61	58
Hungary	55	65	64
Poland	48	56	62
Romania	26	47	45
Slovenia	80	91	87
Slovakia	50	72	74
Euro area 17	112	108	108
EU - 27	100	100	100

Source: Eurostat database

The results show that starting 2000 and until 2008 there has been a general trend of real convergence catch – up of the ten CEE countries analyzed. Looking at the Euro area average, we notice an opposite trend, but this is certainly due to the Eurozone accession of countries with lower levels of GDP per capita. In 2010, only Slovakia and Poland recorded an increase in the GDP per capita, while the other countries, with the exception of Bulgaria with constant levels, revealed decreasing trends, as a consequence of the recent economic crisis.

5. Results and the Discussion of the Findings

The results obtained in SPSS are detailed in Table2. The dissimilarity matrix shows the evolution of Euclidian distances between the analyzed countries and the Euro area average in 2000, before their EU accession, in 2008, as the year when the recent economic crisis began in the European Union and in 2010, a year that reveals the effects of the crisis on real convergence.

Table 2 Dissimilarity matrix for Central and Eastern European countries

Source: Author's work

Country	Distance from Euro area in 2000	Distance from Euro area in 2008	Distance from Euro area in 2010	**Distance evolution in 2010 compared to 2008**
Bulgaria	0.977	1.000	1.000	**0.000**
Czech Republic	0.512	0.415	0.431	**0.016**
Estonia	0.779	0.615	0.662	**0.047**
Latvia	0.872	0.800	0.862	**0.062**
Lithuania	0.849	0.723	0.769	**0.046**
Hungary	0.663	0.662	0.677	**0.015**
Poland	0.744	0.800	0.708	**-0.092**
Romania	1.000	0.938	0.969	**0.031**
Slovenia	0.372	0.262	0.323	**0.061**
Slovakia	0.721	0.554	0.523	**-0.031**
Euro area 17	0.000	0.000	0.000	**0.000**

Source: author's work

Analyzing the results according to the accession waves to the EU, we reach to the following conclusions. Bulgaria and Romania the new members of the EU starting 2007 present diverging evolutions. In 2000 Romania had the lowest convergence level with the Euro area, being by far the most distanced from it. Bulgaria ranked second in terms of highest divergent level with the Eurozone. However, in 2008 and 2010 Bulgaria became the most distanced CEE country from the Euro area. Romania becomes its follower. Because of the economic crisis, relatively to the other CEE countries and to the Eurozone, Romania records a lower convergence level in 2010 as compared to 2008, revealed by the increased Euclidian distance (+0.031). Although Romania recorded a high level of economic growth (7.3%) in 2008, the following years placed Romania under a negative sign that is a sharp decline of 7.1% in 2009 and another decrease of 1.3% in 2010. The large macroeconomic imbalances made it difficult to create incentives for the economic recovery. Moreover, the recession was prolonged by the important adjustment suffered by the domestic demand.

The other CEE countries, new members of the EU starting with 2004, recorded, generally speaking, an increase in real convergence levels in 2008 as compared to 2000, with the exception of Poland which presents a relative lower convergence level relative to the other CEE countries. The impact of the economic crisis is quite clear for all these countries: it led to diverging paths in terms of catching – up with GDP per capita of the Euro area. The distance evolution shows us that Latvia, followed by Slovenia, lost the most in terms of convergence catch – up (+0.062, respectively +0.061). The countries that lost the least were Hungary and the Czech Republic (+0.015, respectively +0.016). Surprisingly or not, there were also countries that improved their real convergence in a period of difficult economic times. These were Poland and Slovakia, with negative distance evolutions: -0.092, respectively -0.031.

Particularly, in the case of Estonia, Slovenia and Slovakia, which are also Eurozone members, we can notice that only Estonia and Slovenia followed the decreasing trend of real convergence in 2010 compared to 2008, while Slovakia recorded an increase in the real convergence during the recent economic crisis.

Regarding Poland, if we take a look at the economic growth in European Union in 2009, this is the only country with positive GDP growth rate (European Commission, 2011). Poland seems to have reached the best performances in dealing with the economic crisis. This was driven by private consumption and public investment supported by EU funds inflows. The main advantage of Poland remained its large domestic market, an important market to turn to when international opportunities are not anymore a solution. Yet, the uncertain global outlook held back private investments in Poland. After a 4.8% decrease in GDP in 2009, Slovakia recovered, with growth re-entering an upward path in 2010 (European Commission, 2011). The recovery was based on a strong export performance. This rebound of economic activity is backed by the better economic situation of Germany, Slovakia's main trading partners. Investments and industrial production acceleration led to a real GDP growth of 4% in 2010. However, Slovakia is confronted with deteriorating labor markets and high unemployment rates.

6. Conclusions

It would have been expected that the economic crisis to create a general decreasing path in the catch – up convergence process of Central and Eastern Europe. The current study reveals that there are also some exceptions. Summarizing the results above, we can state that the economic crisis represented an opportunity for Poland and Slovakia to improve their real convergence level with the Eurozone, while for Bulgaria it did not bring any change in the real convergence level. Bulgaria remained, in 2008 and 2010, the most distanced from the Euro area average. As for the other 7 CEE countries in the study, the analysis confirms that they have been experiencing some diverging paths from the Eurozone average.

Acknowledgement

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