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## The analysis of the convergence criteria. Empirical perspective in the context of the sustainable character highlight

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**THE ROMANIAN ACADEMY  
THE NATIONAL INSTITUTE OF  
ECONOMIC RESEARCH**

**WORKING PAPERS**

***The Analysis of The Convergence Criteria.  
Empirical Perspective in the Context of the  
Sustainable Character Highlight***

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# THE ANALYSIS OF THE CONVERGENCE CRITERIA. EMPIRICAL PERSPECTIVE IN THE CONTEXT OF THE SUSTAINABLE CHARACTER HIGHLIGHT<sup>1</sup>

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*This study envisages analyzing the convergence criteria in the context of recent macroeconomic developments, focusing on their sustainability. In order to highlight the sustainability of convergence indicators, the paper includes an analysis of the initial dynamics, both in terms of nominal and real plan, highlighting the need for an integrated approach aiming to capture the junction between the two types of convergence processes. Subsequently, sustainability is revealed through the prism of critical aspects, and through the correlation between economic cycles in the European Union. Study findings and proposals tend to review the set of indicators related to the process of nominal convergence towards the integration of real dimension of this process in order to achieve a striking mix.*

*Keywords: nominal and real convergence, convergence criteria, sustainability of convergence, economic cycles*

*JEL classification: E20, E60, E61, E52*

## Introduction

The experience of the financial crisis has revealed many problematic situations for the euro area. The sharp increase in the share of budget deficit and public debt to GDP, with growth flattening process led to major macroeconomic imbalances over time. In this context, the continued appropriateness of the nominal convergence criteria has become subject to various reflections and analysis. Many critics have been generated; in essence, the financial crisis has revealed the inability of the convergence criteria to reflect the ability of Member States to achieve a level of

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<sup>1</sup> This study is a part of post-doctoral research project The sustainability of nominal and real convergence within the EU in the context of the financial crisis: implications on the prudential regulatory framework within the POSDRU project "Scientific research economic, support to welfare and human development in a European context "developed within the National Institute of Economic Research" Costin C. Kirişescu ".

<sup>2</sup> The National Bank of Romania and National Institute of Economic Research of the Romanian Academy

economic development to allow integration in the euro area and therefore strict compliance with the governing financial, fiscal and monetary policies.

The current collapse of Greece has been determined by gradual accumulation of significant fiscal deficits that caused an excessive level of debt. Moreover, the Greek deep recession has been considered by many analysts as the result of the inconsistencies between nominal and real convergence indicators. In the moment it joined the euro area, Greece was compliant with the nominal convergence criteria, but as for the real convergence criteria, the situation was not a favorable one.

First, the dynamics of convergence is emphasized over the past ten years, following a differentiated perspective according to the level of economic development, membership of the euro area and the time integration in the EU. Subsequently, the poor aspects of nominal convergence criteria are revealed in the light of recent macroeconomic developments as well as in the light of differences in relation to the real convergence, whereas the last part of the research includes an analysis of the business cycles correlation in the EU countries.

This research continues similar efforts initiated by Kornai (2006), Mayes and Viren (2009), Darvas (2010), bringing forth an extension of the period under analysis during which the real and nominal convergence indicators are assessed and a filtering of aspects pertaining to their sustainability from the perspective of the deficiencies highlighted by recent macroeconomic developments and timing of economic cycles.

This empirical view is substantiated by a literature review on the link between the two types of convergence, aiming to highlight the business cycles harmonization as well.

This study is structured as follows: the first section is dedicated to a literature review on the relationship between the nominal convergence and real convergence; section 2 includes an analysis of the dynamics of real and nominal convergence indicators, differentiated according to the euro area and to the new Member States while in Section 3 there are revealed a number of critical aspects of nominal convergence indicators stipulated by the Maastricht Treaty, with the underlying explanations. Section 4 highlights the sustainability of convergence process in the European Union.

## 1. Literature review

The current state of literature on the relationship between nominal and real convergence in the newly integrated countries in the European Union includes a number of studies that have revealed major disparities at both the inter-regional and intra-regional level. Raileanu-Szeles and Marinescu (2010) showed the eclectic nature of the research in this area, many of them pointing out the issue of differing value judgments. In essence, most countries joining the EU in the last waves of integration are distinguished by a common pattern in their trajectory; over a long period, they have been subjected to the communist regime, with a planned economy in which free enterprise was practically nonexistent. After the collapse of this regime, countries have gone through the transition to market economy and subsequently through the EU accession process, completed in different stages.

Since 2000 various studies have been developed, analyzing the state of nominal and real convergence in Central and Eastern Europe. Initially, the results of studies have confirmed a positive relationship between the two types of convergence, namely Bergs (2000), Bjorksten (2001) have emphasized that complying with the criteria for nominal convergence leads to real convergence.

Barrientos (2007) illustrated the correlation between the two convergence processes under the impact of temporal dimension:

- long term, real convergence reduces the differences between the structural conditions of different countries or regions and reduces disparities;
- short-term, real convergence determines a more symmetrical character of shocks, reflected in the similarity of variables reaction, representing real economy, to shocks.

Égert et. al (2006b) shows that within the monetary union, the effects of shocks depend on the degree of their asymmetry, while asymmetry is explained in terms of different economic structures. A fundamental aspect of the research on the subject was the identification of the timing for adopting the single currency; while some authors consider that integration in the euro area should be done only if the real and nominal convergence criteria are respected, even if the period is longer, affecting the possibility of integration in the euro area as quickly, other authors set forth that the earliest possible integration generates beneficial effects in terms of reducing the gap between developed and emerging countries.

Kocenda (2005) reveals a similar GDP/capita in terms of dynamics, reflecting an effective process of convergence on the real economy; in terms of nominal economy, the author showed a sustained convergence process especially at the level of the fiscal and monetary dimension, highlighted by the interest rate.

Leine, Ruprecht et. al (2007) revealed that the real convergence process generates multiple structural changes leading in time to increased productivity, better labor skills and enhanced international trade flows. Lee et. al (2004) have emphasized, moreover, important contribution of GDP/capita on the openness of the economy.

The literature on convergence in the countries of Central and Eastern Europe illustrated the Balassa-Samuelson (BS) through the correlation between productivity growth and inflation; according to the BS theory, an emerging country with a fast-productivity growth is likely to record faster convergence of productivity levels in the tradable goods sector than the non-tradable sector. The existence of a higher productivity increases wages in the corresponding economic sector while factor mobility triggers wage growth in other sectors; afterwhile, this phenomenon propagates a general price level increase.

In general, research has shown BS effect in the Central and Eastern Europe countries; Leine-Ruprecht et. al (2007) showed attenuation of this effect under the impact of the openness of the economy.

In this context, studies highlighting the optimum currency area (OCA) theory and the convergence under the impact of the EU enhanced business cycles synchronization become eloquent. In the literature, the issue of economic cycles harmonization is reflected through various results; there are some studies that show a EU15 synchronization (Caporale and Soliman (2009), Babetskii (2005)) as well as studies that have shown a significant de-correlation from this point of view (and Furceri Afonso (2008), Crespo-Cuaresma and Fernandez-Amador (2010)). However, in recent years studies highlight the de-synchronization of economic cycles.

## **2. The analysis of the nominal convergence indicators**

In order to create an economic and monetary union, the Treaty of Maastricht introduced as fundamental parts of the nominal convergence an assembly of criteria on which the EU appreciates the ability of countries to join the euro area. Nominal convergence criteria are related to a set of policies

- financial, monetary, currency, fiscal and macro-financial architecture that substantiates the nations becoming members of the Euro-zone.

In essence, the convergence criteria consist of a series of macroeconomic indicators that have been calibrated to specific reference levels considered to be sustainable for a stable macroeconomic environment.

Reference values for the analyzed indicators are :

- 1.5% above the average of the three best performing states recorded over the last two years in case of the inflation rate;
- 2% above the average of the three best performing states recorded over the last two years in case of the interest rate;
- 3% share of GDP years in case of the budget deficit;
- 60% share of GDP in case of the public debt.

Analysis of the indicators of nominal convergence is achieved during the period 2000-2010, with the fore in the EU countries. The analysis will be conducted on a comparative perspective of the actual values of macroeconomic indicators registered in EU countries compared with the reference values of the indicators.

As for the inflation rate, we remark that involves a dynamic of reference values divided into two sub-periods:

- 2000-2006, where the reference value is fluctuating, reaching a peak of 3.1% in 2001 and a minimum of 2.2 % in 2004. During this period, the reference value recorded variations from one year to another.
- Since 2006, inflation reference rate constantly decreased from 2.9% to 1.1% in 2010. Prior to 2006, inflation reference value was marked by an increase from 2.5% in 2005 to a value of 2.9% in 2006. This dynamic path of inflation reflects the positive macroeconomic developments in the EU before 2006, while the financial crisis has generated the beginning of a deflation process.

Once noted a gradual lowering of the reference values corresponding to the inflation rate, the capacity of the Member States to join the defined limits of this indicator is reduced. Thus, if during the period 2000-2006, Austria, Finland, Luxembourg, Denmark, Sweden recorded values of the inflation rate lower than the reference levels, since 2007 the actual amounts recorded for this indicator have been above the threshold.

However, at the regional level in the euro area, we remark a stronger convergence in the inflation rate; average inflation in the euro area is below the reference value, which reflects the performance in this respect of the states' capacity to mitigate regional disparities caused by other countries, which had an inflation rate above the reference.



This is remarkable in the EU 27 as well, highlighting the ability to absorb negative effects caused by important differing values recorded by this indicator for some countries due to the power of convergence of other important countries. A higher degree of convergence is reflected in the rate of interest. Reference values have declined almost constantly from 2000 until 2010.

Indicators that show the highest degree of divergence derive from the fiscal area. The actual share of the budget deficit and public debt to GDP is moving away from the reference value as the time of financial crisis is approaching, i.e. 2006-2007. Out of the two indicators specific to fiscal convergence process, the budget deficit is the most divergent.

### **2.1 The situation of the convergence indicators at the level of the EU15**

As for the **inflationary pressures**, Belgium and Denmark have breached the reference values during the recent years (4.5%, 3.6% and 2.4% and 2%, comparative to 2% and 1%). Germany boasts a high degree of discipline in terms of convergence rate of inflation during the analyzed period, only in 2008 and 2010, respectively, it exceeded the reference value by an extremely low value (2.8% and 1.1% compared with 2.5% and 1.1%). Another country with a high degree of alignment with the reference values of inflation is France. In 2000-2007, the actual values of inflation stood at all times under the reference; because of the imbalances triggered by the financial crisis, the values of this indicator are above the reference level (3.1% and 1.7% compared by 2.5% and 1%). In 2009, inflation has a value of 0%, highlighting a deflationary process.

As regards Ireland, during 2000-2003, inflation has exceeded the reference value permanently, while during the time interval 2004-2007, we note a tendency of indicators to attain levels below the reference value. The outbreak of the financial turmoil caused reappearance of inflation values above or just below the reference level in 2008-2010 (3% -2.3% and -1.5% compared with 2.5%, 1.6% and 1%). Negative values reflect a real process with deflationary effects in the macroeconomic environment. The same trajectory of inflation is remarked in Italy, Austria, Luxembourg, Sweden and Great Britain, meaning that there is a high process of convergence until 2006, while subsequently a significant slippage-reflected into a departure from the baseline- intervened.

Greece and Spain are distinguished by the highest level of indiscipline in the rate of inflation over ten years (2000-2010), since the countries were unable to control the inflationary process in order to record the values below the reference; during the last two years, the indicators were closed to the reference values due to deflation.

Table no. 1

The evolution of the inflation rate in the EU in 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>EU27</b>	2.3	2.8	2.5	2.0	2.1	2.2	2.3	2.3	3.6	0.8	1.9
<b>Euro 17</b>	2.2	2.4	2.2	2.0	2.0	2.1	2.2	2.1	3.3	0.1	1.5
<b>Belgium</b>	2.7	2.4	1.5	1.4	1.8	2.5	2.4	1.7	4.5	-0.1	2.4
<b>Bulgaria</b>	10.7	7.7	4.9	2.3	5.2	6.0	5.3	8.0	12.1	1.8	1.9
<b>Czech</b>	4.30	4.7	1.4	-0.2	2.5	1.6	2.2	2.2	5.9	0.0	0.9
<b>Denmark</b>	2.8	2.3	2.5	2.2	1.2	1.7	1.9	1.7	3.6	1.0	2.0
<b>Germany</b>	1.4	1.9	1.2	0.9	1.5	1.6	1.7	2.2	2.8	0.1	1.1
<b>Estonia</b>	3.1	5.5	3.8	1.2	3.1	4.1	4.5	7.0	10.1	-0.8	2.6
<b>Ireland</b>	4.6	4.1	4.6	3.5	2.2	2.3	2.8	2.6	3.0	-2.3	-1.5
<b>Greece</b>	2.9	3.5	3.8	3.4	2.9	3.6	3.2	2.8	4.3	1.2	4.2
<b>Spain</b>	3.5	2.8	3.5	3.1	3.0	3.3	3.6	2.7	4.1	-0.5	1.8
<b>France</b>	1.8	1.7	1.8	1.9	1.8	2.0	2.0	1.6	3.1	0.0	1.7
<b>Italy</b>	2.6	2.4	2.6	2.7	2.1	2.0	2.1	2.0	3.5	0.7	1.6
<b>Cyprus</b>	4.8	1.9	2.5	3.4	1.6	2.1	2.3	2.2	4.5	0.1	2.6
<b>Latvia</b>	2.4	2.5	1.9	3.0	6.2	7.1	6.5	9.8	13.7	2.0	-1.6
<b>Lithuania</b>	2.0	1.7	0.2	-1.5	1.0	2.9	4.1	5.8	10.8	3.2	0.2
<b>Luxembourg</b>	3.8	2.2	1.6	2.0	2.7	3.3	2.9	2.4	3.8	-0.6	2.7
<b>Hungary</b>	5.50	5.30	5.0	4.2	6.4	3.5	4.0	8.0	6.1	3.7	4.4
<b>Malta</b>	2.7	2.4	2.3	1.9	2.2	2.6	2.7	0.7	4.8	1.8	1.9
<b>Netherland</b>	2.3	5.0	3.8	2.2	1.2	1.4	1.6	1.6	2.1	0.7	0.8
<b>Austria</b>	2.0	2.3	1.6	1.2	2.0	2.0	1.7	2.2	3.2	0.4	1.7
<b>Poland</b>	10.2	5.4	1.9	0.9	3.7	2.1	1.2	2.6	3.9	3.4	2.3
<b>Portugal</b>	2.9	4.4	3.7	3.2	2.5	2.1	2.8	2.3	2.5	-1.0	1.3
<b>Romania</b>	45,7	34,5	22,7	14,9	11,6	8,9	5,9	4,3	7,8	4,5	5,5
<b>Slovenia</b>	8.3	8.6	7.1	5.3	3.6	2.4	2.5	3.6	5.7	0.6	1.8
<b>Slovakia</b>	12.3	7.4	3.1	8.2	7.4	3.0	4.3	1.7	3.9	0.5	0.4
<b>Finland</b>	2.9	2.7	2.1	1.3	0.9	0.9	1.2	1.6	3.8	1.2	1.5
<b>Sweden</b>	1.3	2.8	2.0	2.4	1.0	0.9	1.5	1.4	3.1	1.9	1.9
<b>UK</b>	0.5	1.1	1.2	1.3	1.2	1.9	2.3	2.2	3.5	2.0	3.0

Source: own computations based on the data extracted from [www.eurostat.org.com](http://www.eurostat.org.com)

Portugal is characterized by a different path of inflation; if during the period 2000-2004, the actual value of the indicator was below the benchmark, 2005 marked the beginning of an imbalance in the capacity of the Member State to fulfill the convergence criteria inflation.

With regard to **budgetary discipline**, it is noted that Germany has evolved to balance the budget

Table no. 2

The evolution of the budget deficit in the EU in 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>EU27</b>	0.6	-1.4	-2.5	-3.1	-2.9	-2.5	-1.5	-0.9	-2.4	-6.8	-6.4
<b>Euro 17</b>	0.0	-1.9	-2.6	-3.1	-2.9	-2.5	-1.4	-0.7	-2.0	-6.3	-6.0
<b>Belgium</b>	0.0	0.4	-0.1	-0.1	-0.3	-2.7	0.1	-0.3	-1.3	-5.9	-4.1
<b>Bulgaria</b>	-0.5	1.1	-1.2	-0.4	1.8	1.0	1.9	1.1	1.7	-4.7	-3.2
<b>Czech</b>	-3.7	-5.6	-6.8	-6.6	-3.0	-3.6	-2.6	-0.7	-2.7	-5.9	-4.7
<b>Denmark</b>	2.3	1.5	0.4	0.1	2.1	5.2	5.2	4.8	3.2	-2.7	-2.7
<b>Germany</b>	1.3	-2.8	-3.7	-4.0	-3.8	-3.3	-1.6	0.3	0.1	-3.0	-3.3
<b>Estonia</b>	-0.2	-0.1	0.3	1.7	1.6	1.6	2.4	2.5	-2.8	-1.7	0.1
<b>Ireland</b>	4.7	0.9	-0.4	0.4	1.4	1.6	2.9	0.1	-7.3	-14.3	-32.4
<b>Greece</b>	-3.7	-4.5	-4.8	-5.6	-7.5	-5.2	-5.7	-6.4	-9.8	-15.4	-10.5
<b>Spain</b>	-1.0	-0.6	-0.5	-0.2	-0.3	1.0	2.0	1.9	-4.2	-11.1	-9.2
<b>France</b>	-1.5	-1.5	-3.1	-4.1	-3.6	-2.9	-2.3	-2.7	-3.3	-7.5	-7.0
<b>Italy</b>	-0.8	-3.1	-2.9	-3.5	-3.5	-4.3	-3.4	-1.5	-2.7	-5.4	-4.6
<b>Cyprus</b>	-2.3	-2.2	-4.4	-6.5	-4.1	-2.4	-1.2	3.4	0.9	-6.0	-5.3
<b>Latvia</b>	-2.8	-1.9	-2.3	-1.6	-1.0	-0.4	-0.5	-0.3	-4.2	-9.7	-7.7
<b>Lithuania</b>	-3.2	-3.6	-1.9	-1.3	-1.5	-0.5	-0.4	-1.0	-3.3	-9.5	-7.1
<b>Luxembourg</b>	6.0	6.1	2.1	0.5	-1.1	0.0	1.4	3.7	3.0	-0.9	-1.7
<b>Hungary</b>	-3.0	-4.0	-8.9	-7.2	-6.4	-7.9	-9.3	-5.0	-3.7	-4.5	-4.2
<b>Malta</b>	-6.2	-6.4	-5.5	-9.9	-4.7	-2.9	-2.8	-2.4	-4.5	-3.7	-3.6
<b>Netherland</b>	2.0	-0.2	-2.1	-3.1	-1.7	-0.3	0.5	0.2	0.6	-5.5	-5.4
<b>Austria</b>	-1.7	0.0	-0.7	-1.5	-4.5	-1.7	-1.6	-0.9	-0.9	-4.1	-4.6
<b>Poland</b>	-3.0	-5.3	-5.0	-6.2	-5.4	-4.1	-3.6	-1.9	-3.7	-7.3	-7.9
<b>Portugal</b>	-2.9	-4.3	-2.9	-3.0	-3.4	-5.9	-4.1	-3.1	-3.5	-10.1	-9.1
<b>Romania</b>	-4.7	-3.5	-2.0	-1.5	-1.2	-1.2	-2.2	-2.6	-5.7	-8.5	-6.4
<b>Slovenia</b>	-3.7	-4.0	-2.5	-2.7	-2.3	-1.5	-1.4	-0.1	-1.8	-6.0	-5.6
<b>Slovakia</b>	-12.3	-6.5	-8.2	-2.8	-2.4	-2.8	-3.2	-1.8	-2.1	-8.0	-7.9
<b>Finland</b>	6.8	5.0	4.0	2.4	2.3	2.7	4.0	5.2	4.2	-2.6	-2.5
<b>Sweedden</b>	3.6	1.5	-1.3	-1.0	0.6	2.2	2.3	3.6	2.2	-0.7	0.0
<b>UK</b>	3.6	0.5	-2.1	-3.4	-3.4	-3.4	-2.7	-2.7	-5.0	-11.4	-10.4

Source: own computations based on the data extracted from [www.eurostat.org.com](http://www.eurostat.org.com)

deficits within the limits imposed by the convergence criterion, except the years of 2002, 2003 and 2010 where the share of budget deficit to GDP reached values of 3.7%, 4% and 3.3%; during the other years the effective deficit was below 3% of GDP. However, as regards the fiscal rigor,

Denmark is ranked first for the period under review, the budget balance was predominantly positive, except the last two years (2009, 2010), when the deficit was below the threshold (2,7%).

Table no.3

The evolution of public debt share in GDP in the EU in 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>EU27</b>	61.9	61.0	60.4	61.8	62.2	62.8	61.5	59.0	62.3	74.4	80.0
<b>Euro 17</b>	69.1	68.1	67.9	69.0	69.5	70.0	68.4	66.2	69.9	79.3	85.1
<b>Belgium</b>	107.9	106.6	103.5	98.5	94.2	92.1	88.1	84.2	89.6	96.2	96.8
<b>Bulgaria</b>	72.5	66.0	52.4	44.4	37.0	27.5	21.6	17.2	13.7	14.6	16.2
<b>Czech</b>	18.5	24.9	28.2	29.8	30.1	29.7	29.4	29.0	30.0	35.3	38.5
<b>Denmark</b>	52.4	49.6	49.5	47.2	45.1	37.8	32.1	27.5	34.5	41.8	43.6
<b>Germany</b>	59.7	58.8	60.4	63.9	65.8	68.0	67.6	64.9	66.3	73.5	83.2
<b>Estonia</b>	5.1	4.8	5.7	5.6	5.0	4.6	4.4	3.7	4.6	7.2	6.6
<b>Ireland</b>	37.8	35.5	32.1	30.9	29.6	27.4	24.8	25.0	44.4	65.6	96.2
<b>Greece</b>	103.4	103.7	101.7	97.4	98.6	100.0	106.1	105.4	110.7	127.1	142.8
<b>Spain</b>	59.3	55.5	52.5	48.7	46.2	43.0	39.6	36.1	39.8	53.3	60.1
<b>France</b>	57.3	56.9	58.8	62.9	64.9	66.4	63.7	63.9	67.7	78.3	81.7
<b>Italy</b>	109.2	108.8	105.7	104.4	103.9	105.9	106.6	103.6	106.3	116.1	119.0
<b>Cyprus</b>	58.8	60.7	64.6	68.9	70.2	69.1	64.6	58.3	48.3	58.0	60.8
<b>Latvia</b>	12.3	14.0	13.5	14.6	14.9	12.4	10.7	9.0	19.7	36.7	44.7
<b>Lithuania</b>	23.7	23.1	22.3	21.1	19.4	18.4	18.0	16.9	15.6	29.5	38.2
<b>Luxembourg</b>	6.2	6.3	6.3	6.1	6.3	6.1	6.7	6.7	13.6	14.6	18.4
<b>Hungary</b>	54.9	52.0	55.6	58.3	59.1	61.8	65.7	66.1	72.3	78.4	80.2
<b>Malta</b>	55.9	62.1	60.1	69.3	72.4	69.6	64.2	62.0	61.5	67.6	68.0
<b>Netherland</b>	53.8	50.7	50.5	52.0	52.4	51.8	47.4	45.3	58.2	60.8	62.7
<b>Austria</b>	66.5	67.3	66.7	65.8	65.2	64.6	62.8	60.7	63.8	69.6	72.3
<b>Poland</b>	36.8	37.6	42.2	47.1	45.7	47.1	47.7	45.0	47.1	50.9	55.0
<b>Portugal</b>	48.5	51.2	53.8	55.9	57.6	62.8	63.9	68.3	71.6	83.0	93.0
<b>Romania</b>	22.5	25.7	24.9	21.5	18.7	15.8	12.4	12.6	13.4	23.6	30.8
<b>Slovenia</b>	:	26.7	27.9	27.3	27.4	26.7	26.4	23.1	21.9	35.2	38.0
<b>Slovakia</b>	50.3	48.9	43.4	42.4	41.5	34.2	30.5	29.6	27.8	35.4	41.0
<b>Finland</b>	43.8	42.5	41.5	44.5	44.4	41.7	39.7	35.2	34.1	43.8	48.4
<b>Sweedden</b>	53.9	54.7	52.5	51.7	50.3	50.4	45.0	40.2	38.8	42.8	39.8
<b>UK</b>	41.0	37.7	37.5	39.0	40.9	42.5	43.4	44.5	54.4	69.6	80.0

Source: own computations based on the data extracted from [www.eurostat.org.com](http://www.eurostat.org.com)

Financial crisis generated a swelling budget deficit to GDP ratio; if during the period 2000-2007, France, Italy, Luxembourg, Netherlands, UK and

even Portugal have effectively managed public finances, managing to maintain a positive budget balance or slightly negative, below the limit imposed by the convergence criteria, with the financial crisis, budget deficit ratio to GDP increased significantly, reaching alarming levels even more than 7% of GDP for France (7%), Spain (9.2 %), Portugal (9.1%) or UK (10.4%).

Nevertheless, in terms of leverage, Spain managed to ensure its proper control by 2009, with any breach of the reference level. A galloping growth occurred in 2009-2010, with a share of GDP amounting from 60.1% to 53.3%.

Luxembourg has the lowest indebtedness degree during the analyzed period, with an average of about 6% by 2007, while later on the public debt to GDP increased to 14.6% in 2009 and to 18.4% in 2010. Other countries with rigorous management of public debt to GDP are the Netherlands, Finland and Sweden, where the appearance of financial turmoil has increased the debt over the fence required by the convergence criteria, leading only a to an increase of 10%, which continued to maintain the public debt to GDP in the 60% limit.

Greece is in a position to state the highest deficit recorded over the period analyzed, either before the financial crisis, the share of GDP budget deficit was not managed effectively, reaching almost permanently above the reference values (4.5% in 2001, 5.2% in 2005, 6.4% in 2007). The emergence of the financial turmoil triggered the inflammation of unprecedented budget deficit, which in 2008 reached 9.8%, while in 2009 its value amounted to 15.4% and 10.5% in 2010. The same situation is found at the level of public debt to GDP, Greece recording an average of this indicator superior to 100% over the period.

Another country with a high degree of fiscal indiscipline is Italy, which even in the period before the outbreak of the financial turmoil experienced a GDP share of public debt exceeding 100%. This is in contrast with the deficit that, with certain exceptions, was maintained within the convergence criteria, with any slippages not even under the impact of the financial crisis.

At the opposite pole lies Ireland which until the outbreak of financial imbalances has failed to show adequate control of public finances, accounting for almost the entire analyzed period a positive budget balance; once the financial crisis broke out, since 2007, suddenly the budget balance became negative, reaching alarming levels: 7.3% in 2008, 14.3% in 2009 and 32.4% in 2010. Moreover, the same considerations can be made at the level of debt ratio to GDP; by 2008, Ireland met this convergence criterion, giving leverage to approximately half the reference value, while in 2009 and 2010 the values of this indicators rose alarmingly to 65.6% and 96.2%.

France and Britain have applied a more relaxed management of public finances, maintaining a share of public debt to GDP close to baseline throughout the analyzed period. Under the impact of financial crisis, public debt to GDP increased, reaching 81.7% and 80% in 2010 in France and in the UK.

The average share of budget deficit to GDP in the EU 27 and the euro area increased in the period under review from 3.1% in 2003 to 6.4% and 6% in 2010. It is noted that even in the euro area the share of budget deficit to GDP is much lower than the value within EU 27, which shows poor management of public finances including at the level of the euro area countries.

A particularly interesting aspect is that public debt to GDP in the euro area average is higher than the EU 27 average, reflecting significant levels of debt for countries in this area. From this perspective, we appreciate that *Euro-zone* countries have exerted a negative effect in the EU 27, essentially causing a spiraling financial crisis, anchored initially in the sub-prime loans, subsequently passing on public finances. The work brings to the fore the innovative idea of disparities in the EU through the gaps created not only due to significant differences between the economic development of emerging countries compared with developed countries but also in terms of imbalances caused by the degree of excessive indebtedness of euro area countries. Practically non-existent budgetary discipline in Portugal, Italy, Greece and Spain led to significant accumulation of deficits over time that conducted to the emergence of significant turbulences, with negative effects on the macroeconomic stability.

## **2.2 The situation of the convergence indicators in the NSM 12**

In the countries of Central and Eastern Europe, the Baltic States - Latvia and Lithuania- are characterized by a convergence nearly at the level of all nominal convergence indicators. Except for inflation which implies a degree of divergence for the four sub-periods in both countries, all other indicators showed a sustained convergence. Exchange rate stability is explained in terms of monetary council that monetary policy strategy. An important aspect of analysis is constituted by the dynamics in relation to the trigger time of financial crisis.

The period previous to the crisis outbreak- 2005-2007 - is characterized by a convergence process for all indicators, while the subsequent period generates a difference. The only indicator that is leading the convergence in the context of financial turbulences appearance is the interest rate. This applies to all other countries except for Poland, fully characterized by a convergence state during the post-crisis period, even at the level of the interest rate. As regards the entire sample of countries, inflation and budget deficits have generated problematic situations,

breaching the reference values in the post-crisis period. This is explained in terms of decreasing tax revenues generated by macroeconomic imbalances and financial turmoil. Concerning the inflation rate, the existence of differences is notable even previously to the financial crisis, reflecting the period of consumption-led growth, generating inflation.

Table no. 4

The evolution of interest rate in the EU in 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>EU27</b>	5.50	5.00	4.92	4.23	4.38	3.71	4.03	4.56	4.55	4.13	3.83
<b>Euro 17</b>	5.44	5.00	4.91	4.14	4.12	3.42	3.84	4.32	4.31	3.82	3.62
<b>Belgium</b>	5.59	5.13	4.99	4.18	4.15	3.43	3.81	4.33	4.42	3.90	3.46
<b>Bulgaria</b>	7.20	6.70	6.60	6.45	5.36	3.87	4.18	4.54	5.38	7.22	6.01
<b>Czech</b>	6.50	6.31	4.88	4.12	4.82	3.54	3.80	4.30	4.63	4.84	3.88
<b>Denmark</b>	5.64	5.08	5.06	4.31	4.30	3.40	3.81	4.29	4.28	3.59	2.93
<b>Germany</b>	5.26	4.80	4.78	4.07	4.04	3.35	3.76	4.22	3.98	3.22	2.74
<b>Estonia</b>	5.51	5.01	5.01	4.13	4.08	3.33	3.76	4.31	4.53	5.23	5.74
<b>Ireland</b>	6.10	5.30	5.12	4.27	4.26	3.59	4.07	4.50	4.80	5.17	9.09
<b>Greece</b>	5.53	5.12	4.96	4.12	4.10	3.39	3.78	4.31	4.37	3.98	4.25
<b>Spain</b>	5.39	4.94	4.86	4.13	4.10	3.41	3.80	4.30	4.23	3.65	3.12
<b>France</b>	5.58	5.19	5.03	4.25	4.26	3.56	4.05	4.49	4.68	4.31	4.04
<b>Italy</b>	8.00	7.62	5.70	4.74	5.80	5.16	4.13	4.48	4.60	4.60	4.60
<b>Cyprus</b>	7.90	7.57	5.41	4.90	4.86	3.88	4.13	5.28	6.43	12.36	10.34
<b>Latvia</b>	8.00	8.15	6.06	5.32	4.50	3.70	4.08	4.55	5.61	14.00	5.57
<b>Lithuania</b>	5.52	4.86	4.70	3.32	2.84	2.41	3.30	4.46	4.61	4.23	3.17
<b>Luxembourg</b>	8.00	7.95	7.09	6.82	8.19	6.60	7.12	6.74	8.24	9.12	7.28
<b>Hungary</b>	6.50	6.19	5.82	5.04	4.69	4.56	4.32	4.72	4.81	4.54	4.19
<b>Malta</b>	5.40	4.96	4.89	4.12	4.10	3.37	3.78	4.29	4.23	3.69	2.99
<b>Netherlands</b>	5.56	5.08	4.96	4.14	4.13	3.39	3.80	4.30	4.36	3.94	3.23
<b>Austria</b>	11.00	10.68	7.36	5.78	6.90	5.22	5.23	5.48	6.07	6.12	5.78
<b>Poland</b>	5.59	5.16	5.01	4.18	4.14	3.44	3.91	4.42	4.52	4.21	5.40
<b>Portugal</b>	:	:	:	:	:	6.75	7.23	7.13	7.70	9.69	7.34
<b>Romania</b>	:	:	8.72	6.40	4.68	3.81	3.85	4.53	4.61	4.38	3.83
<b>Slovenia</b>	:	8.04	6.94	4.99	5.03	3.52	4.41	4.49	4.72	4.71	3.87
<b>Slovakia</b>	5.48	5.04	4.98	4.13	4.11	3.35	3.78	4.29	4.29	3.74	3.01
<b>Finland</b>	5.37	5.11	5.30	4.64	4.42	3.38	3.70	4.17	3.89	3.25	2.89
<b>Sweden</b>	5.33	5.01	4.91	4.58	4.93	4.46	4.37	5.06	4.50	3.36	3.36

Source: own computations based on the data extracted from [www.eurostat.org.com](http://www.eurostat.org.com)

Inflation rate convergence occurs only for Latvia and Lithuania in the short term, i.e. 1999-2001 and 2002-2004, explained by the effects of immediate shock therapy due to the monetary anchor adoption.

In Bulgaria, although monetary policy strategy was similar, beneficial effects were not felt in the inflation rate, the country presenting a high divergence in inflation. Conversely, positive effects were felt in the budget deficit that is constantly in a state of convergence in relation to benchmarks. Also, Bulgaria is a country in a position with a well-managed fiscal policy in terms of converging values recorded in the public debt. Even after the emergence of financial turmoil, Bulgaria presents convergence compared to benchmarks in the public debt.

As for the budget deficit, the situation is characterized by diversity. There are a number of countries - Bulgaria, Latvia and Lithuania, where budgetary policies have been managed effectively, highlighting a convergence of budget deficit towards the reference value; in opposition, there are countries such as Romania, Poland and Hungary which are characterized by differences.

Except for Hungary, all countries present convergence for the debt indicator, both previously to the crisis outbreak, as well as beyond. This is in opposition against the developed countries - Greece, Ireland, Portugal, Spain - where the values reflect an extremely high leverage.

As regards Romania, the interest rate is the only indicator showing a high degree of divergence in all sub-periods; other indicators that are quite far removed from the reference value are inflation and budget deficit.

Migrating to the area of real convergence analysis, we note that the GDP/ capita recorded the highest values for EU15, followed by the euro and EU25. NSM10 is positioned at approximately half of the GDP/ capita corresponding to the euro area while NSM12 is placed at a significant distance.



Table no.5

The evolution of GDP/capita in the EU in 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>EU27</b>	100	100	100	100	100	100	100	100	100	100	100
<b>Euro 17</b>	113	113	113	114	113	112	111	110	112	115	113
<b>Belgium</b>	129	127	127	128	129	129	127	126	129	133	132
<b>Bulgaria</b>	9	10	11	11	12	13	15	16	19	20	:
<b>Czech</b>	31	34	38	38	40	44	47	49	57	55	:
<b>Denmark</b>	171	169	168	169	168	170	170	167	170	171	173
<b>Germany</b>	132	130	127	126	124	121	119	118	121	124	125
<b>Estonia</b>	24	26	28	31	33	37	42	47	48	44	44
<b>Ireland</b>	145	153	162	169	169	173	176	174	162	152	141
<b>Greece</b>	66	68	70	75	77	78	80	81	84	88	83
<b>Spain</b>	82	84	86	90	91	93	94	94	95	97	94
<b>France</b>	124	124	122	123	122	121	120	118	120	124	122
<b>Italy</b>	110	111	111	112	110	108	106	104	105	107	105
<b>Cyprus</b>	76	78	77	79	79	80	80	81	87	90	89
<b>Latvia</b>	19	20	21	21	22	25	30	37	41	35	33
<b>Lithuania</b>	19	20	21	23	24	27	30	34	38	34	34
<b>Luxembourg</b>	264	258	262	276	277	290	303	313	324	325	335
<b>Hungary</b>	26	30	34	35	38	39	38	40	42	39	40
<b>Malta</b>	57	55	55	53	52	53	53	53	57	60	62
<b>Netherland</b>	138	141	141	142	139	140	140	140	145	147	145
<b>Austria</b>	136	133	132	133	131	132	131	131	136	139	139
<b>Poland</b>	25	28	27	24	25	28	30	33	38	35	38
<b>Portugal</b>	65	66	66	66	65	65	64	64	65	67	66
<b>Romania</b>	10	10	11	12	13	16	19	23	26	23	23
<b>Slovenia</b>	57	58	60	62	63	64	65	69	74	74	72
<b>Slovakia</b>	21	22	24	26	29	32	35	41	48	49	50
<b>Finland</b>	134	136	135	134	134	133	133	136	139	136	137
<b>Sweden</b>	159	144	146	150	150	147	148	148	144	133	151
<b>UK</b>	143	140	141	133	137	135	136	135	118	108	111

Source: own computations based on the data extracted from [www.eurostat.org.com](http://www.eurostat.org.com)

In the new Member States which are not yet in the euro area, Romania and Bulgaria have the lowest values as for this indicator (3.385 EUR, respectively, 2.814 EUR), and the highest values are recorded in case of the Czech Republic and Hungary. The group of the recently integrated Member States (in 2004) is remarkable, in fact, for the lowest values of this indicator.

Table no. 6

The evolution of labor productivity (expressed in EUR/work hour) in the EU in 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>EU27</b>	25.5	26.0	26.4	26.8	27.2	27.5	28.0	28.3	28.3	28.0	28.4
<b>Euro 17</b>	30.1	30.4	30.7	31.0	31.3	31.6	32.2	32.5	32.5	32.2	32.7
<b>Belgium</b>	39.7	38.7	39.2	39.6	41.2	40.9	41.5	42.2	41.7	41.2	41.00
<b>Bulgaria</b>	2.6	2.8	2.9	3.0	3.0	3.2	3.3	3.4	3.5	3.4	3.6
<b>Czech</b>	6.1	6.5	6.6	6.9	7.2	7.5	7.9	8.2	8.3	8.3	8.3
<b>Denmark</b>	40.4	40.2	40.5	41.2	42.3	42.9	43.3	43.2	42.0	41.3	43.0
<b>Germany</b>	35.8	36.4	37.0	37.4	37.6	38.1	39.3	39.7	39.6	38.7	39.1
<b>Estonia</b>	5.4	5.8	6.2	6.5	7.0	7.4	7.8	8.3	8.0	8.2	8.7
<b>Ireland</b>	31.7	32.9	34.9	36.1	36.6	36.9	37.4	38.4	38.2	39.3	40.2
<b>Greece</b>	15.3	15.9	16.2	17.0	17.5	17.7	17.5	18.2	18.4	18.9	17.7
<b>Spain</b>	22.2	22.3	22.5	22.7	22.8	23.0	23.2	23.6	23.8	24.4	24.4
<b>France</b>	37.2	37.5	38.6	39.0	39.3	39.9	41.0	40.8	40.4	39.9	39.9
<b>Italy</b>	27.9	28.1	28.0	27.6	27.9	28.1	28.1	28.2	27.9	27.4	27.9
<b>Cyprus</b>	16.6	16.7	17.0	16.7	17.1	17.5	17.7	18.1	18.3	18.3	18.5
<b>Latvia</b>	4.1	4.4	4.6	4.9	5.3	5.7	6.2	6.6	6.6	6.4	6.7
<b>Lithuania</b>	4.8	5.4	5.6	6.1	6.5	6.6	7.0	7.4	7.6	7.1	7.5
<b>Luxembourg</b>	:	:	50.9	51.5	52.7	54.7	55.5	56.3	54.7	54.6	54.6
<b>Hungary</b>	5.9	6.3	6.6	6.9	7.3	7.5	7.8	7.9	8.0	7.8	7.9
<b>Malta</b>	14.7	16.9	14.9	15.3	15.0	15.6	15.9	15.9	16.3	16.3	16.3
<b>Netherland</b>	35.9	36.1	36.4	36.9	38.1	38.8	39.4	40.1	40.6	39.5	40.4
<b>Austria</b>	31.8	31.8	32.4	32.5	33.1	33.7	34.6	35.5	35.8	35.5	35.8
<b>Poland</b>	6.1	6.4	6.7	7.0	7.3	7.4	7.6	7.8	7.9	8.2	8.3
<b>Portugal</b>	12.8	13.0	13.1	13.1	13.2	13.4	13.6	13.8	13.8	13.8	14.0
<b>Romania</b>	2.0	2.2	2.5	2.7	3.0	3.1	3.3	3.5	3.8	3.5	3.6
<b>Slovenia</b>	13.8	14.3	14.4	14.9	15.3	16.4	17.4	18.2	18.1	16.9	16.9
<b>Slovakia</b>	6.0	6.3	6.7	7.2	7.4	7.6	8.2	8.6	9.0	9.1	9.3
<b>Finland</b>	32.9	33.5	34.0	34.8	36.0	36.7	37.8	39.0	38.8	37.3	38.0
<b>Sweedeen</b>	38.0	38.2	39.7	41.2	42.6	43.9	45.2	45.1	44.4	43.3	44.6
<b>UK</b>	34.1	34.5	35.4	36.5	37.2	37.6	38.4	39.1	39.3	38.1	:

Source: own computations based on the data extracted from [www.eurostat.org.com](http://www.eurostat.org.com)

In terms of productivity, the euro area has a productivity far below the EU27 level; also the productivity of the member states integrated in 2004 is well below that of the euro area. Considering the group of new Member States outside the euro area, the highest value of productivity is recorded for

the Czech Republic, followed by Lithuania and Poland. Bulgaria and Romania remain on last position, recording the lowest levels of productivity. Close values of productivity achieved in the Member States integrated in 2004 from those recorded in the euro area are also reflected as for the relationship between exports and imports (see Table 7).

Table no. 7

The evolution of the export ratio in the EU in 2000-2010

	2001	2002	2003	2004	2005	2006	2007	2008	2009
<b>Belgium</b>	101.0	101.7	102.1	103.2	100.2	99.8	99.4	99.6	100.8
<b>Bulgaria</b>	95.7	96.7	92.2	96.4	104.1	99.6	78.4	66.2	76.0
<b>Czech</b>	99.2	100.1	99.0	101.3	105.1	107.2	108.8	110.5	112.5
<b>Denmark</b>	100.2	100.8	102.1	102.3	99.3	96.1	92.0	92.5	98.7
<b>Germany</b>	105.7	111.0	109.2	113.4	114.7	115.4	118.0	117.8	109.3
<b>Estonia</b>	99.1	97.3	96.7	99.0	108.1	105.0	101.9	116.5	127.5
<b>Ireland</b>	107.3	111.5	115.8	116.4	106.3	101.5	100.9	104.8	121.0
<b>Greece</b>	100.7	94.4	92.5	89.9	105.0	108.3	100.9	97.1	119.3
<b>Spain</b>	102.4	102.7	101.3	96.8	93.4	91.8	91.6	97.1	105.2
<b>France</b>	101.2	104.0	102.2	100.6	99.6	98.6	95.6	94.8	92.7
<b>Italy</b>	100.8	98.2	94.8	94.8	94.1	94.5	96.2	98.1	95.4
<b>Cyprus</b>	100.8	93.1	97.3	145.7	201.3	165.5	139.6	127.1	145.7
<b>Latvia</b>	97.7	94.9	94.0	94.0	102.4	93.2	89.7	108.5	136.3
<b>Lithuania</b>	105.4	103.5	103.0	104.8	109.3	108.3	102.7	115.0	135.4
<b>Luxembourg</b>	107.6	107.9	116.7	121.5	138.6	142.5	137.3	142.0	149.0
<b>Hungary</b>	104.2	105.4	103.2	106.1	110.4	116.9	121.7	121.3	127.0
<b>Malta</b>	98.9	100.9	96.0	97.3	96.4	96.6	95.4	95.9	84.1
<b>Netherland</b>	102.0	104.0	104.4	104.9	107.8	109.3	108.7	108.5	111.7
<b>Austria</b>	102.2	108.3	105.9	108.4	109.8	112.5	112.6	113.3	107.8
<b>Poland</b>	108.2	110.2	118.0	122.6	131.8	132.2	127.6	125.5	136.8
<b>Portugal</b>	100.1	104.8	111.4	108.6	107.1	112.8	114.6	112.0	109.7
<b>Romania</b>	92.1	95.7	89.8	85.3	81.4	73.6	67.3	68.6	86.3
<b>Slovenia</b>	104.3	106.7	103.5	104.2	111.2	111.6	111.6	109.6	113.5
<b>Slovakia</b>	94.7	95.7	104.2	98.3	97.1	100.8	105.6	109.3	110.1
<b>Finland</b>	99.8	96.3	94.2	94.0	87.6	88.9	85.5	85.4	82.0
<b>Sweedn</b>	100.2	102.0	102.7	104.4	101.1	101.4	96.2	96.2	95.4
<b>UK</b>	96.2	93.5	91.9	88.4	87.7	88.3	83.7	85.7	86.7

Source: own computations based on the data extracted from [www.eurostat.org](http://www.eurostat.org)

For an economy to be considered powerful in terms of openness, the ratio between exports and imports must be higher than one, meaning that the productivity surplus might be capitalized through exports.

At the individual level, disparities are evident in the group of countries integrated in the latest wave. Thus, discrepancies are noted although as for the entire group of countries, the ratio reaches 15.47. In case of the Czech Republic and Hungary, the indicator stands at 19% and respectively 13.63%, while in case of Lithuania and Latvia, it stands at 3.34% and 1.34%. The highest value is recorded in case of Poland (53.45%), and a rather low level stands for Bulgaria. Romania and Hungary have similar values of this indicator (13.03 against 13.63) (see Table 7).

Migrating to the analysis of monetary and financial convergence specific indicators, the share of credit to GDP reveals a very high level for EU15 and Euro area (1.98 and 1.84 respectively), EU25 and EU27 (1.72 and 1.7), reflected in higher than one values of the report. As for the integrated group of countries, the share of credit to GDP shows a high level of heterogeneity (see Table 8).

Table no. 8

The evolution of the credit share in GDP in the EU in 2001-2010

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Euro 17</b>	0.84	0.87	0.87	0.88	0.89	0.92	1.00	1.13	1.17	1.14	1.13
<b>Belgium</b>	0.75	0.74	0.71	0.70	0.69	0.72	0.79	0.93	0.89	0.81	0.77
<b>Bulgaria</b>	0.42	0.38	0.35	0.30	0.27	0.30	0.33	0.54	0.70	0.72	0.73
<b>Czech</b>	0.29	0.28	0.26	0.24	0.26	0.29	0.32	0.45	0.48	0.46	0.47
<b>Denmark</b>	1.23	1.32	1.33	1.34	1.38	1.52	1.70	2.02	2.13	2.01	1.95
<b>Germany</b>	1.04	1.06	1.04	1.03	0.98	0.94	0.94	1.01	1.01	0.97	0.94
<b>Estonia</b>	0.72	0.64	0.58	0.50	0.42	0.48	0.68	1.05	1.07	0.95	0.85
<b>Ireland</b>	0.92	1.01	1.01	1.03	1.20	1.42	1.83	2.46	2.48	2.24	1.74
<b>Greece</b>	0.38	0.43	0.47	0.52	0.55	0.60	0.66	0.78	0.87	0.86	1.12
<b>Spain</b>	0.78	0.81	0.84	0.89	0.97	1.15	1.40	1.69	1.79	1.73	1.69
<b>France</b>	0.69	0.71	0.70	0.70	0.72	0.75	0.82	0.95	1.00	0.96	0.98
<b>Italy</b>	0.68	0.70	0.71	0.74	0.75	0.78	0.86	0.98	1.01	1.00	1.05
<b>Cyprus</b>	2.19	2.08	1.93	1.79	1.67	1.54	1.58	1.99	2.53	2.62	2.67
<b>Latvia</b>	0.38	0.38	0.34	0.29	0.33	0.42	0.61	1.01	1.15	1.01	0.88
<b>Lithuania</b>	0.34	0.31	0.28	0.25	0.21	0.30	0.37	0.64	0.74	0.64	0.57
<b>Luxembourg</b>	3.14	3.21	2.83	2.44	2.24	2.37	2.48	3.35	3.53	3.16	3.09
<b>Hungary</b>	0.42	0.40	0.36	0.33	0.42	0.43	0.48	0.64	0.69	0.61	0.58

<b>Malta</b>	1.28	1.30	1.28	1.20	1.14	1.05	1.14	1.30	1.50	1.43	1.42
<b>Netherland</b>	1.17	1.23	1.28	1.34	1.40	1.44	1.46	1.62	1.63	1.67	1.57
<b>Austria</b>	0.91	0.94	0.92	0.89	0.89	0.96	0.98	1.08	1.16	1.11	1.11
<b>Poland</b>	0.29	0.32	0.30	0.25	0.23	0.23	0.25	0.41	0.42	0.42	0.44
<b>Portugal</b>	1.05	1.13	1.17	1.15	1.16	1.19	1.29	1.48	1.57	1.61	1.60
<b>Romania</b>	0.21	0.20	0.17	0.13	0.11	0.13	0.20	0.35	0.40	0.37	0.35
<b>Slovenia</b>	0.51	0.49	0.46	0.44	0.41	0.45	0.53	0.74	0.86	0.86	0.84
<b>Slovakia</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.48	0.46	0.43	0.43
<b>Finland</b>	0.46	0.51	0.53	0.56	0.59	0.62	0.67	0.81	0.86	0.82	0.83

Source: own computations based on the data extracted from [www.eurostat.org.com](http://www.eurostat.org.com)

Although the average value amounts to 0.71, which is very close to the level corresponding to new Member States integrated in 2004, there are significant differences at the individual level. Thus, in case of Romania and Czech Republic there are recorded the lowest value - 0.27, 0.39 respectively, while the highest values are recorded in case of Hungary (0.79), Latvia (0.77) and Lithuania (0.50). Countries that have recorded maximum values involve a corresponding volatility indicator, reflecting the variation of the indicator from one period to another.

Comparative analysis of the deposits share in GDP shows that the new Member States do not involve significant differences in comparison with the euro area. The share of deposits to GDP amounts to 65% in the euro area while in the new Member States, its level varies from 85% to 83% in the Czech Republic and in Poland or 88% in Romania. The highest values are recorded in the case of Hungary (115%) and Bulgaria (113%) (see Table 9).

Table no.9

The evolution of the deposit share in GDP in the EU in 2001-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Euro 17</b>	0.75	0.79	0.78	0.80	0.81	0.83	0.88	1.02	1.09	1.09	1.10
<b>Belgium</b>	0.90	0.95	0.95	0.99	1.04	1.08	1.13	1.26	1.29	1.26	1.23
<b>Bulgaria</b>	0.29	0.32	0.33	0.35	0.39	0.41	0.19	0.26	0.30	0.36	0.40
<b>Czech</b>	0.18	0.19	0.18	0.14	0.13	0.12	0.11	0.15	0.14	0.12	0.09
<b>Germany</b>	0.96	0.99	0.98	0.99	0.98	0.97	0.99	1.11	1.14	1.16	1.13
<b>Estonia</b>	0.11	0.10	0.09	0.08	0.08	0.10	0.13	0.19	0.23	0.20	0.16
<b>Ireland</b>	0.71	0.73	0.76	0.78	0.80	0.90	1.11	1.37	1.41	1.40	1.36
<b>Greece</b>	0.73	0.76	0.70	0.67	0.68	0.73	0.77	0.88	1.03	0.99	0.97
<b>Spain</b>	0.71	0.75	0.76	0.77	0.81	0.95	1.14	1.36	1.59	1.60	1.59
<b>France</b>	0.60	0.62	0.61	0.66	0.67	0.67	0.67	0.76	0.79	0.81	0.85

<b>Italy</b>	0.47	0.49	0.51	0.50	0.50	0.52	0.55	0.70	0.75	0.77	0.88
<b>Cyprus</b>	0.45	0.52	0.53	0.36	0.34	0.32	0.30	0.31	0.31	0.33	0.32
<b>Latvia</b>	0.07	0.07	0.07	0.07	0.07	0.06	0.08	0.15	0.19	0.19	0.17
<b>Lithuania</b>	0.09	0.08	0.08	0.09	0.08	0.08	0.10	0.17	0.21	0.22	0.19
<b>Luxembourg</b>	6.78	6.34	5.59	5.31	5.13	4.96	5.32	5.95	5.21	4.80	4.55
<b>Hungary</b>	0.23	0.22	0.20	0.20	0.24	0.21	0.23	0.28	0.31	0.29	0.25
<b>Malta</b>	0.24	0.29	0.32	0.27	0.25	0.26	0.26	0.27	0.27	0.24	0.23
<b>Netherland</b>	0.87	0.94	0.94	0.98	0.97	1.06	1.13	1.31	1.42	1.36	1.31
<b>Austria</b>	0.82	0.87	0.84	0.85	0.84	0.87	0.89	1.03	1.06	1.04	1.01
<b>Poland</b>	0.22	0.24	0.22	0.19	0.17	0.16	0.15	0.19	0.21	0.21	0.20
<b>Portugal</b>	0.89	0.91	0.87	0.86	0.87	0.92	0.96	1.07	1.16	1.23	1.30
<b>Romania</b>	0.17	0.16	0.14	0.11	0.10	0.11	0.13	0.16	0.17	0.20	0.20
<b>Slovenia</b>	52.04	63.37	62.68	58.63	57.63	51.77	47.98	50.58	49.63	48.11	48.11
<b>Slovakia</b>	0.28	0.25	0.22	0.19	0.18	0.14	0.16	0.18	0.24	0.23	0.23
<b>Finland</b>	0.46	0.45	0.46	0.47	0.47	0.46	0.46	0.57	0.60	0.63	0.63
<b>United Kingdom</b>	0.11	0.13	0.11	0.11	0.11	0.12	0.16	0.20	0.17	0.17	0.17

Source: own computations based on the data extracted from [www.eurostat.org.com](http://www.eurostat.org.com)

### 3. Critical aspects of the convergence criteria

Recent developments in the macroeconomic situation of the countries in the Central and Eastern Europe have highlighted the limited character of the nominal convergence criteria. Assessment of the EU Member States' ability to meet the euro area requirements taking into account a series of nominal indicators, totally disparate with respect to the area of real convergence, is poor because of the fact that recent financial turmoil came amid a massive de-correlation between nominal economy, reflected in the financial flows and real economy, as evidenced, among other things, in the volume of goods and services produced, as well as in the level of the living standards (Iancu, 2011). Thus, it was necessary to correlate the real and nominal convergence criteria, namely their inclusion in an integrated system, including indicators anchored in both types of convergence.

From this perspective, there have been noted several contradictions between these criteria. On the one hand, a rigorous control of inflation often involves an increase in interest rate and exchange rate appreciation, which may lead to a violation of the nominal convergence criteria.

On the other hand, interest rate decrease results in inflammation of inflationary pressures. Lewis and Staehr highlighted even from 1997 some problematic situations in the convergence criteria. Setting benchmark

inflation rate implies real difficulties for EU enlargement; integration of other countries has generated the decrease of reference value. In this way, compliance with the reference value is becoming increasingly difficult for Member States.

Dobrinsky (2006), and Lewis (2007) have highlighted the last two enlargements have resulted in lower reference value. Jonas (2006) showed that a unique benchmark for the whole EU27 is not appropriate, being more relevant to establish two reference values depending on the stage of the business cycle, meaning a benchmark for countries experiencing an overheating of the economy and another benchmark for other countries passing through the descending phase of the economic cycle.

Busetti et. al (2007) pointed out that establishing a baseline inflation by reference to the three best performing countries in the field can lead to a situation where a country is included in the group of best performing countries in this respect, but being likely in the meanwhile to not meet this convergence criterion.

In line with the literature and recent macroeconomic developments, there have been highlighted a number of weak sides in terms of nominal convergence criteria. Thus, convergence criterion on price stability was defined in terms of average inflation rate reflected in the harmonized index of consumer prices that should not exceed by more than 1.5% p.p. the level corresponding to the best performing countries in this regard. This evolution should prove to be sustainable at the same time.

In essence, the best states in this regard are those in which the lowest inflation rate is recorded, which can be in contradiction with the main objective of the ECB, respectively the HICP must be closest to 2%.

Exemplifying the case of five countries with inflation rates of 1.3%, 1.5%, 1.7%, 1.9%, 2.1% and 1.5%, the referential consists of the average of the lowest inflation rates; in line with the European Central Bank objective, the referential would result in a value of 1.9%.

Referring strictly to this phrase, the application of the criterion would result in taking into account the three countries closer to the value of 2% and the arithmetic mean should be calculated based on the values 1.5%, 1.7%, 1.9 %, resulting in a referential of 1.7%.

To counter these concerns, it would be appropriate to establish the reference as a precise range of variation for inflation, envisaging mainly to extend the corridor by about 3 percentage points. This solution would not be viable if inflation spikes could occur, which would cause the violation of the reference.

Another solution would be to determine a referential under the form of a weighted average of the contribution to GDP of all HCPI of the Eurosystem member countries, which would reduce asymmetries observed in the prices of the member countries.

Table 10 highlights the dynamic of this indicator calculated for the euro area, which reveals the ongoing deflationary process during the period 2002-2010; this points to the fact that given the situation outlined, it would be appropriate for an extension of the inflation variation band, regarded as a benchmark for the nominal size of the convergence process.

Table no. 10

The evolution of the weighted HIPC in the euro zone

	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>HIPC euro zone</b>	-3.14	-2.06	-2.12	-2.13	-2.13	-2.11	-2.31	-2.43	-2.22

Source: own computations based on the data extracted from [www.eurostat.org.com](http://www.eurostat.org.com)

On the other hand, the existence of an inflationary process is natural for accelerated economic growth, not implying negative effects if the velocity of money remains at a sustainable pace. In fact, the inflationary process acquires negative accents where the speed corresponding to the circulation of money is beyond the GDP growth; once maintained a correlation between the two growth rates, inflation retains the sustainable connotation.

Table no.11

The evolution of the money velocity in the EU in 2000-2010 (absolute value)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Euro 17</b>	NA	NA	NA	1.14	1.10	1.03	0.97	0.89	0.83	0.80	0.79
<b>Belgium</b>	0.78	0.81	0.77	0.72	0.72	0.69	0.66	0.65	0.61	0.91	0.94
<b>Bulgaria</b>	NA	NA	NA	NA	1.65	1.42	1.19	0.97	0.94	0.85	0.81
<b>Czech</b>	NA	NA	1.42	1.42	1.30	1.18	1.06	0.94	0.85	0.80	0.77
<b>Germany</b>	2.56	2.39	2.16	1.93	1.92	1.73	1.60	1.39	1.28	1.15	1.08
<b>Estonia</b>	0.58	0.57	0.56	0.53	0.52	0.50	0.49	0.48	0.50	0.62	0.63
<b>Ireland</b>	NA	NA	NA	NA	2.08	1.62	1.41	1.34	1.23	1.06	1.07
<b>Greece</b>	NA	0.29	0.32	0.28	0.31	0.40	0.58	0.84	0.99	0.99	1.18
<b>Spain</b>	NA	1.03	1.08	1.12	1.07	0.95	0.91	0.84	0.73	0.68	NA
<b>France</b>	1.02	0.96	0.92	0.84	0.72	0.58	0.47	0.41	0.38	0.35	NA
<b>Italy</b>	0.99	0.94	0.92	0.85	0.81	0.77	0.72	0.65	0.61	0.58	NA



<b>Cyprus</b>	1.22	1.17	1.09	1.04	0.99	0.92	0.85	0.73	0.64	0.56	NA
<b>Latvia</b>	0.63	0.58	0.55	0.53	0.52	0.50	0.45	0.39	0.29	0.28	NA
<b>Lithuania</b>	NA	NA	NA	3.17	2.82	2.23	1.79	1.72	1.75	1.47	1.32
<b>Luxembourg</b>	1.90	2.02	2.16	2.38	2.56	2.08	1.85	1.67	1.72	1.46	1.36
<b>Hungary</b>	NA	0.08	0.09	0.11	0.13	0.15	0.18	0.21	0.22	0.21	NA
<b>Malta</b>	NA	NA	NA	1.72	1.51	1.40	1.27	1.16	1.13	1.04	1.04
<b>Netherland</b>	0.85	0.76	0.70	0.69	0.68	0.68	0.65	0.58	0.54	0.51	NA
<b>Austria</b>	0.72	0.66	0.62	0.57	0.53	0.47	0.45	0.43	0.41	0.37	NA
<b>Poland</b>	0.70	0.65	0.65	0.62	0.59	0.55	0.52	0.49	0.44	0.43	NA
<b>Portugal</b>	NA	NA	NA	NA	2.30	1.95	1.78	1.57	1.61	1.49	1.38
<b>Romania</b>	0.87	0.84	0.85	0.81	0.80	0.78	0.73	0.64	0.53	0.45	NA
<b>Slovenia</b>	NA	NA	NA	NA	3.19	2.28	1.77	1.50	1.53	1.37	1.27
<b>Slovakia</b>	2.57	2.03	1.86	1.80	1.70	1.66	1.63	0.93	1.26	1.02	NA
<b>Finland</b>	1.10	1.01	1.02	1.12	1.03	1.04	0.98	0.96	0.97	NA	NA
<b>United Kingdom</b>	1.50	1.47	1.34	1.28	1.21	1.12	1.06	1.00	0.90	0.82	NA

Source: own computations based on the data extracted from [www.eurostat.org](http://www.eurostat.org)

In this sense, the integration of an indicator to reflect the interference with the real economy, namely the correlation between inflation and velocity of money, is appropriate.

Tables 11 and 12 highlight the velocity of money as the ratio between real GDP and M3, both in terms of absolute and relative values .

Table no.12

The evolution of the money velocity in the EU in 2000-2010 (relative value)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Euro 17</b>				-3.51	-6.36	-5.83	-8.25	-6.74	-3.61	-1.25
<b>Belgium</b>	3.85	-4.94	-6.49	0.00	-4.17	-4.35	-1.52	-6.15	49.18	3.30
<b>Bulgaria</b>	NA	NA	NA	NA	-13.94	-16.20	-18.49	-3.09	-9.57	-4.71
<b>Czech</b>	NA	NA	0.00	-8.45	-9.23	-10.17	-11.32	-9.57	-5.88	-3.75
<b>Germany</b>	-6.64	-9.62	-10.65	-0.52	-9.90	-7.51	-13.13	-7.91	-10.16	-6.09
<b>Estonia</b>	-1.72	-1.75	-5.36	-1.89	-3.85	-2.00	-2.04	4.17	24.00	1.61
<b>Ireland</b>	NA	NA	NA	NA	-22.12	-12.96	-4.96	-8.21	-13.82	0.94
<b>Greece</b>	NA	10.34	-12.50	10.71	29.03	45.00	44.83	17.86	0.00	19.19
<b>Spain</b>	NA	4.85	3.70	-4.46	-11.21	-4.21	-7.69	-13.10	-6.85	NA
<b>France</b>	-5.88	-4.17	-8.70	-14.29	-19.44	-18.97	-12.77	-7.32	-7.89	NA
<b>Italy</b>	-5.05	-2.13	-7.61	-4.71	-4.94	-6.49	-9.72	-6.15	-4.92	NA
<b>Cyprus</b>	-4.10	-6.84	-4.59	-4.81	-7.07	-7.61	-14.12	-12.33	-12.50	NA
<b>Latvia</b>	-7.94	-5.17	-3.64	-1.89	-3.85	-10.00	-13.33	-25.64	-3.45	NA

<b>Lithuania</b>	NA	NA	NA	-11.04	-20.92	-19.73	-3.91	1.74	-16.00	-10.20
<b>Luxembourg</b>	6.32	6.93	10.19	7.56	-18.75	-11.06	-9.73	2.99	-15.12	-6.85
<b>Hungary</b>	NA	12.50	22.22	18.18	15.38	20.00	16.67	4.76	-4.55	NA
<b>Malta</b>	NA	NA	NA	-12.21	-7.28	-9.29	-8.66	-2.59	-7.96	0.00
<b>Netherlands</b>	-10.59	-7.89	-1.43	-1.45	0.00	-4.41	-10.77	-6.90	-5.56	NA
<b>Austria</b>	-8.33	-6.06	-8.06	-7.02	-11.32	-4.26	-4.44	-4.65	-9.76	NA
<b>Poland</b>	-7.14	0.00	-4.62	-4.84	-6.78	-5.45	-5.77	-10.20	-2.27	NA
<b>Portugal</b>	NA	NA	NA	NA	-15.22	-8.72	-11.80	2.55	-7.45	-7.38
<b>Romania</b>	-3.45	1.19	-4.71	-1.23	-2.50	-6.41	-12.33	-17.19	-15.09	NA
<b>Slovenia</b>	NA	NA	NA	NA	-28.53	-22.37	-15.25	2.00	-10.46	-7.30
<b>Slovakia</b>	-21.01	-8.37	-3.23	-5.56	-2.35	-1.81	-42.94	35.48	-19.05	NA
<b>Finland</b>	-8.18	0.99	9.80	-8.04	0.97	-5.77	-2.04	1.04	NA	NA
<b>United Kingdom</b>	-2.00	-8.84	-4.48	-5.47	-7.44	-5.36	-5.66	-10.00	-8.89	NA

Source: own computations based on the data extracted from [www.eurostat.org.com](http://www.eurostat.org.com)

In terms of absolute growth, where the velocity is maintained at a consistent pace with GDP growth, the range can be extended. Although the analysis of nominal convergence indicators reveals Belgium, Denmark and Ireland in the position of countries that violate the stance reference value of the inflation rate over the last three years, the related evolution of money velocity shows a stabilization tendency, even in the sense growth indicator. In this context, a proposal could be to increase the range of variation of 2.5 pp for countries where money velocity has dropped by more than 25%.

Although the analysis of nominal inflation rate criterion places Germany in the category of most disciplined countries in this respect, the velocity of money reflects an imbalance of real versus monetary economy since GDP is only about 50% -60% of M3.

Greece, Spain and Portugal have recorded, indeed, a constant decrease of the indicator, reflecting an increase in the volume of currency in relation to the flow of goods and services, which was highlighted in the case of nominal convergence indicator.

The same is true for the new Member States, a report between GDP and M3 higher than one showing that countries of Central and Eastern Europe are characterized by a departure from the baseline, reflected in the decrease of money velocity.

As for the nominal interest rate, it must not exceed by more than 2 percentage points the level of the best performing Member States in terms of price stability (i.e. the arithmetic mean of long-term interest rates).

An issue of this criterion consists in using long-term government securities or similar securities since there are not bonds with a maturity close to 10 years in all Member States. In this case, different securities with various maturities are compared, which implies a high degree of flaw.

Another problem is limiting the interest rates corresponding to long-term securities, which leads to a high opportunity cost, namely eliminating the opportunities to valorize the short term interest differentials.

From this perspective, it would be more appropriate to select as referential the monthly average of Euribor 12M and to compare it with average interest rates on interbank monetary markets of acceding countries (Robor 12M for Romania), all as monthly averages. Table 13 shows the evolution of short-term interest rates in the new Member States in the euro area; with the exception of Romania, Hungary and Poland, other countries show a high degree of convergence with the euro area since interest rates on short-term are correlated with those in this area. Thus, by using this referential, the potential for interest rate harmonization is enhanced, unlike the classic indicator of nominal convergence.

Table no. 13

The evolution of the short term interest rate (one month) in the EU and in the euro zone in

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>EU27</b>	:	4.79	3.84	2.86	2.82	2.74	3.35	4.44	4.61	1.21	0.78
<b>Euro 17</b>	4.24	4.33	3.30	2.35	2.08	2.14	2.94	4.09	4.27	0.89	0.57
<b>Bulgaria</b>	4.14	5.01	4.32	3.14	3.11	2.71	3.09	4.61	6.71	4.50	2.41
<b>Czech</b>	5.31	5.15	3.58	2.30	2.26	1.97	2.22	2.97	3.81	1.92	1.08
<b>Denmark</b>	4.75	4.76	3.52	2.45	2.18	2.20	3.09	4.31	4.86	2.12	0.98
<b>Latvia</b>	4.65	6.58	3.93	3.54	4.07	2.95	3.89	7.21	6.32	9.19	1.22
<b>Lithuania</b>	7.53	5.27	3.25	2.56	2.20	2.26	2.99	4.90	5.26	3.70	1.00
<b>Hungary</b>	11.44	11.09	9.12	8.42	11.48	7.38	6.96	7.86	8.97	8.90	5.26
<b>Poland</b>	18.49	16.49	9.22	5.74	6.03	5.36	4.17	4.64	6.11	3.88	3.61
<b>Romania</b>	49.70	40.53	26.95	18.20	19.18	7.96	8.11	7.25	12.23	11.32	5.68
<b>Sweedon</b>	3.90	4.10	4.21	3.28	2.30	1.86	2.43	3.75	4.52	0.78	0.72
<b>UK</b>	6.05	5.07	3.99	3.71	4.52	4.74	4.79	5.86	5.18	0.82	0.56

Source: own computations based on the data extracted from [www.eurostat.org.com](http://www.eurostat.org.com)

The adjustment that might be proposed in this respect is the correlation of the 2 pp. with the corresponding CDS country risk, being necessary for the interest rate to integrate a part of the appropriate risk premium.

Table no. 14

The evolution of CDS in the EU in 2006-2010

	2006	2007	2008	2009	2010
<b>Romania</b>	37.25	32.15	277.18	391.44	285.00
<b>Hungary</b>	35.36	28.24	196.33	336.39	242.92
<b>Slovakia</b>	30.85	27.78	238.42	352.25	232.36
<b>Poland</b>	10.17	8.36	64.03	106.44	79.75
<b>Greece</b>	18.75	13.42	95.41	190.31	132.75

Source: own computations based on the data extracted from [www.reuters.org.com](http://www.reuters.org.com)

Which creates a problematic situation is tolerating a difference of over 5 pp., which could lead to excessively high interest rates (probably two digits), generating significant asymmetry. Table 14 presents the spreads dynamics for CDS contracts in case of a few countries from Central and Eastern Europe; as in recent years, these spreads increase, a possible extension of the variation band in relation to the reference value would facilitate greater convergence at the level of this indicator, which thus would be connected with the real economy.

As regards public finances, the government's financial position is considered to be sustainable if it does not create a deficit exceeding 3% of GDP. Similar to budget deficit, public debt to GDP must not exceed the value of 60%. If the indicators exceed these threshold values, the budget deficit and public debt should be reduced substantially and continuously close to to a reference value or exceeding the reference value must be exceptional on a temporary basis. The wording of this criterion of convergence is characterized by ambiguity, reflected in the significant and continuous reduction (without specifying any percentage or a certain period), the substantial and permanent feature (without stating clearly the exceptional conditions, as well as the maximum) as well as the substantial reduction in an appropriate pace (not clearly delineating a specific value or temporal horizon).

Similar to the correlation between inflation rate and money velocity, it is necessary to perform a structural analysis of budget deficit and public debt, since even the fact that they are beyond the level of the two threshold values, this might not automatically imply macroeconomic imbalances.

With the budget deficit and/or public debt that grow mainly due to larger government investment and tax reduction, with beneficial effects on

stimulating government initiative, even in the context of overcoming the limits of 3% and 60% of GDP, this dynamic is considered to be sustainable.

If the indebtedness and that the share of negative budget balance to GDP grow massively in parallel with expenditures directed towards consumption, macroeconomic imbalance is obvious. At the same time, an important aspect lies in the analysis of financing arrangements. If there is an over-exposure of banks to government securities and, therefore, it is necessary to resort to expensive funding sources, the degree of sustainability of the two indicators is eroding. Tables no. 15 and 16 provide a breakdown of government spending in relation to the functional classification criteria.

*Table no.15*

The evolution of the current public expenditures weight in GDP in the EU in 2001-2010

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>EU</b>	19.9	20.4	20.7	20.7	20.8	20.7	20.3	20.8	22.4	22.1
<b>Euro 17</b>	19.8	20.2	20.5	20.4	20.4	20.3	20.0	20.5	22.1	21.9
<b>Belgium</b>	21.7	22.5	22.9	22.7	22.8	22.5	22.3	23.2	24.7	24.3
<b>Bulgaria</b>	18.8	18.9	19.9	19.4	18.3	18.0	17.2	17.1	16.3	15.8
<b>Czech</b>	21.1	22.3	23.4	22.1	22.1	21.3	20.3	20.4	22.1	21.8
<b>Denmark</b>	25.7	26.2	26.5	26.5	26.0	25.9	26.0	26.7	30.0	29.4
<b>Germany</b>	18.9	19.2	19.3	18.8	18.7	18.3	17.9	18.1	19.7	19.5
<b>Estonia</b>	18.8	18.4	18.3	17.6	17.2	16.2	16.7	19.5	22.0	20.6
<b>Ireland</b>	14.7	15.2	15.3	15.5	15.5	15.8	16.3	18.5	19.6	19.1
<b>Greece</b>	17.4	18.3	17.1	17.2	17.1	17.7	17.9	18.2	20.6	18.2
<b>Spain</b>	17.1	17.2	17.4	17.8	18.0	18.0	18.4	19.5	21.1	20.8
<b>France</b>	22.8	23.5	23.8	23.8	23.8	23.5	23.0	23.1	24.5	24.6
<b>Italy</b>	19.0	19.2	19.7	19.9	20.3	20.1	19.7	20.2	21.5	21.1
<b>Cyprus</b>	17.1	18.1	19.6	17.7	17.9	18.4	17.0	17.4	19.4	19.3
<b>Latvia</b>	20.5	21.0	21.4	19.5	17.4	16.6	17.4	19.6	19.6	16.9
<b>Lithuania</b>	21.4	20.9	19.9	19.4	18.7	19.3	17.9	19.3	22.0	20.6
<b>Luxembourg</b>	16.1	16.5	16.4	16.9	16.5	15.4	14.8	14.9	16.7	16.2
<b>Hungary</b>	21.1	22.0	23.3	22.3	22.6	22.9	21.3	21.6	22.2	21.4
<b>Malta</b>	20.1	20.0	20.6	20.8	19.5	20.0	19.1	20.6	21.2	20.6
<b>Netherland</b>	22.6	23.7	24.5	24.2	23.7	25.1	25.2	25.5	28.4	28.5
<b>Austria</b>	18.9	18.6	18.8	18.6	18.5	18.4	18.2	18.6	19.9	19.5
<b>Poland</b>	17.9	17.9	18.1	17.6	18.1	18.3	18.0	18.5	18.4	18.8

<b>Portugal</b>	19.2	19.4	19.8	20.1	20.9	20.2	19.8	20.1	21.8	21.4
<b>Romania</b>	16.2	15.1	19.3	16.3	17.4	16.8	16.3	17.6	18.7	17.2
<b>Slovenia</b>	19.4	19.1	19.0	18.9	19.0	18.8	17.3	18.1	20.2	20.1

Source: own computations based on the data extracted from [www.eurostat.org.com](http://www.eurostat.org.com)

If the indebtedness and the share of negative budget balance to GDP grow massively in parallel with expenditures directed towards consumption, macroeconomic imbalance is obvious.

Table no.16

The evolution of the investment public expenditures share in GDP in the EU in 2001-2010

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>EU</b>	2.4	2.3	2.4	2.4	2.2	2.5	2.6	2.7	2.9	2.7
<b>Euro 17</b>	2.5	2.4	2.5	2.5	2.5	2.5	2.6	2.6	2.8	2.5
<b>Belgium</b>	1.7	1.7	1.6	1.6	1.7	1.6	1.6	1.6	1.8	1.7
<b>Bulgaria</b>	3.4	3.1	2.9	3.2	3.4	4	5.2	5.6	4.9	4.6
<b>Czech</b>	3.5	3.9	4.5	4.8	4.9	5	4.7	4.9	5.2	4.6
<b>Denmark</b>	1.9	1.8	1.6	1.9	1.8	1.9	1.9	1.9	2	2.2
<b>Germany</b>	1.7	1.7	1.6	1.4	1.3	1.4	1.4	1.5	1.6	1.6
<b>Estonia</b>	4.1	5.3	4.4	3.8	4	4.7	5.1	5.3	5.1	3.6
<b>Ireland</b>	4.2	4.2	3.6	3.4	3.5	3.8	4.7	5.3	4.2	3.9
<b>Greece</b>	3.6	3.4	3.5	3.5	2.8	3.4	3.4	3.6	3	2.8
<b>Spain</b>	3.3	3.5	3.6	3.4	3.6	3.7	4	3.9	4.4	3.7
<b>France</b>	3	2.9	3	3.1	3.3	3.2	3.2	3.2	3.4	3
<b>Italy</b>	2.4	1.7	2.5	2.4	2.4	2.3	2.3	2.2	2.5	2.1
<b>Cyprus</b>	2.9	3	3.4	4	3.1	3	2.9	2.9	4.1	3.6
<b>Latvia</b>	1.1	1.3	2.4	3.1	3.1	4.6	5.7	4.8	4.3	3.6
<b>Lithuania</b>	2.2	2.9	3	3.4	3.4	4.1	5.2	4.9	3.9	4.6
<b>Luxembourg</b>	4.3	4.9	4.6	4.3	4.5	3.6	3.3	3.2	3.7	4.1
<b>Hungary</b>	3.7	4.9	3.5	3.5	4	4.4	3.6	2.9	3.1	3.2
<b>Malta</b>	3.4	4.1	4.7	3.9	4.7	4	3.8	2.3	2.2	2.1
<b>Netherland</b>	3.3	3.5	3.6	3.2	3.3	3.3	3.3	3.5	3.9	3.7
<b>Austria</b>	1.2	1.3	1.3	1.2	1.2	1.1	1.1	1.1	1.2	1.2
<b>Poland</b>	3.4	3.4	3.3	3.4	3.4	3.9	4.2	4.6	5.2	5.6
<b>Portugal</b>	3.8	3.5	3.2	3.3	3	2.4	2.7	2.9	2.9	3.3
<b>Romania</b>	2.7	3.4	3.5	3	3.9	5.1	5.6	5.7	5.3	5.5
<b>Slovenia</b>	3.2	3	3.2	3.5	3.2	3.7	4.2	4.4	4.6	4.3
<b>Slovakia</b>	3.1	3.3	2.6	2.4	2.1	2.2	1.9	2	2.3	2.6



<b>Poland</b>	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.4	0.4
<b>Portugal</b>	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.8	0.8
<b>Romania</b>	0.1	0.1	0.1	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0
<b>Slovenia</b>	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4
<b>Slovakia</b>	0.2	0.0	0.0	0.0	-0.1	0.1	0.0	0.1	0.3	0.4
<b>Finland</b>	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4
<b>Sweden</b>	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3
<b>UK</b>	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.7	0.8

Source: own computations based on the data extracted from [www.eurostat.org.com](http://www.eurostat.org.com)

The analysis of nominal convergence indicators highlighted the lax policy practiced by France and UK in terms of public finances, which exceeded by 10% -15% the reference values of budget deficit and public debt.

Table no. 18

The evolution of the share of public debt excess over gold reserves in GDP in the EU in 2001-2010

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Euro 17</b>	46.39	46.05	48.12	52.68	42.52	40.82	36.38	35.86	32.96	26.84
<b>Belgium</b>	1854.67	1838.20	1905.11	2050.95	1795.78	1660.84	1439.36	1423.55	1269.40	1015.18
<b>Bulgaria</b>	680.73	645.40	640.80	666.22	503.09	453.96	391.32	393.42	334.36	249.89
<b>Czech</b>	73.41	60.31	55.06	53.91	33.52	27.62	21.92	18.80	16.22	13.38
<b>Denmark</b>	27.32	31.47	33.31	40.66	32.81	33.41	31.57	31.32	29.34	24.82
<b>Germany</b>	2.55	2.52	2.43	2.51	1.63	1.32	1.00	1.18	1.11	0.88
<b>Estonia</b>	31712.06	30839.99	32175.42	35458.12	27221.32	25349.46	21335.32	20551.73	17785.38	15291.39
<b>Ireland</b>	6.06	7.07	7.65	7.84	6.09	6.34	5.38	6.18	6.70	4.66
<b>Greece</b>	33.61	32.57	38.00	39.73	29.43	25.38	23.04	35.20	37.81	39.11
<b>Spain</b>	28.76	28.95	30.23	33.85	30.53	34.67	46.52	46.62	43.05	34.39
<b>France</b>	12.38	12.06	11.88	12.59	9.90	9.23	8.00	8.71	9.35	7.73
<b>Italy</b>	34.43	35.35	38.53	42.49	33.41	30.22	27.05	26.91	24.71	19.13
<b>Cyprus</b>	27949.60	28518.69	26160.20	28405.23	22502.36	20815.98	17663.89	5994.97	5157.50	3904.69
<b>Latvia</b>	83.03	87.20	97.16	109.71	86.91	78.38	65.13	54.23	52.02	40.28
<b>Lithuania</b>	22.43	20.67	22.29	26.65	20.10	18.94	18.01	39.16	47.05	40.27
<b>Luxembourg</b>	132.72	134.63	139.49	147.30	119.41	120.52	115.15	111.82	142.09	137.62
<b>Hungary</b>	44.64	46.12	47.31	54.94	42.83	47.50	44.92	89.17	72.90	73.24
<b>Malta</b>	81096.50	101292.75	104589.00	124976.75	134283.50	154824.25	38792.53	18135.40	15104.22	26083.13
<b>Netherland</b>	0.30	0.29	0.37	0.40	0.35	0.33	0.30	0.30	0.26	0.20
<b>Austria</b>	64.80	70.47	73.55	81.03	62.91	57.11	50.63	62.03	50.39	39.05
<b>Poland</b>	137.20	134.88	133.71	143.19	109.79	101.01	88.00	88.43	75.30	58.97



<b>Portugal</b>	13.69	13.63	15.36	21.64	20.55	22.25	21.08	18.92	17.68	15.08
<b>Romania</b>	64.40	67.05	71.55	78.57	66.11	63.06	61.45	60.64	54.86	45.37
<b>Slovenia</b>	155.07	140.07	129.03	151.27	176.10	160.53	250.50	267.44	354.97	343.27
<b>Slovakia</b>	12.02	13.05	13.49	15.88	12.52	13.13	11.14	11.80	15.90	12.69
<b>Finland</b>	23.55	22.52	24.17	28.72	19.53	19.31	18.22	19.00	18.49	16.23
<b>Sweeden</b>	31.55	29.94	32.62	35.05	27.72	26.73	23.11	22.85	24.26	20.29
<b>UK</b>	38.75	42.43	43.54	45.72	34.12	30.41	23.46	18.26	16.78	13.90

Source: own computations based on the data extracted from [www.eurostat.org.com](http://www.eurostat.org.com)

On the other hand, Italy, Ireland and Portugal are distinguished by a degree of excessive debt, well above that of those countries; however, coverage of public debt in gold is higher for indebted countries in relation to those that are more cautious in this regard. Thus, France and UK present a debt coverage of gold of 8% and 14%, while Greece and Spain have a value of this indicator over 30%. Ireland and Germany have a low value of this indicator, 5% and 0.88% respectively.

In terms of exchange rate stability, the Maastricht Treaty provides for maintaining the exchange rate in the range of fluctuation margins characteristic to ERM and then (ERM II) for a period of at least two years without experiencing severe tensions, especially without proceeding on its own initiative to devaluation/depreciation of national currency against the euro. The new exchange rate mechanism (ERM II) replaced the ERM in January 1999 and aims at anchoring the currencies of Member States outside the euro area to euro by establishing, by mutual agreement, a fixed but adjustable exchange rate and a standard fluctuation band of  $\pm 15$  percentage points. A narrower fluctuation band can be established by mutual agreement, according to the evolution of the convergence a process.

Exchange rate stability is related to other financial indicators, being basically a consequence of public finance indicators of and of price stability.

On the other hand, an excessive tendency to stabilize the exchange rate results in removal of the economy from the natural steady-state, endangering its self-regulating capacity.

Also, exchange rate stability can not be conceived only in relation to a single currency, but with a currency basket in which, taking into account the fact that a predominant share of trade flows is done in relation to the euro area countries, the euro share may be superior, but it must be accompanied by other currencies, respectively USD, GBP, JPY, and CHF. Their weight can be correlated with the structure of the approximate balance of payments accounts, leading effectively to the determination of a course.

Determining a precise moment for adopting the single currency is made in accordance with diminishing the gap between the economy of financial flows and the real economy; in essence, the Member State must be able to meet all the criteria of real convergence, so that cost-benefit analysis should favor the euro adoption.

As adjustments to this convergence criterion, we can propose an increased flexibility, by maintaining the system of managed floating and coexistence of trend appreciation in real terms with the variability of the quotations on short term. This system ensures a high degree of independence of monetary policy, whose efficacy in controlling inflation will increase.

Also the managed float exchange rate regime is consistent with the nominal anchor choice. This system allows a flexible response to unforeseen external and internal shocks.

As regards to real convergence indicators, their adjustment by coefficients reflecting the impact of asymmetries, polarization, positive and negative externalities of economic growth process in the Member States, with important effects in terms of global economic convergence is required.

Out of these indicators, we can mention:

- Percentage of population living below subsistence level, broken down by categories of the population;
- Index of pollution level in urban and rural environment;
- The share of non-conventional energy sources correlated with annual energy consumption / per capita;
- Recycling and reuse rate of waste;
- Gini coefficient of income inequality by geographical areas, etc.

Research conducted in recent years (Iancu, 2007, 2008, 2009) have shown that the nominal convergence process was favored in comparison with the real convergence since the nominal side is likely to be achieved over a shorter period of time, unlike real convergence which involves carrying out major restructuring, of a much higher degree of complexity in the macroeconomic plan.

In order to meet the Maastricht Treaty criterion, it is necessary for both convergence processes to be performed simultaneously, in full harmony. In essence, the two types of processes influence each other as structural reforms drive convergence at the level of GDP/capita, leading to a non-inflationary wage increase, as well as income tax revenues and therefore a fiscal consolidation.

At the same time, the convergence of productivity levels leads to cost reduction, accelerating deflation in the tradable goods; nominal convergence process affects favorably real variables by reducing inflation and interest rates, which determines an increase in investment and therefore in GDP.

However, during recent years we have seen a clear disparity between the two processes of convergence; although at the EU level, there has been found a degree of nominal convergence, there are still significant gaps in terms of real size. These substantial differences can be explained just in terms of the contradiction between the nominal convergence criteria, as well as through the effects exerted by them in macroeconomic plan. So enforcing the Maastricht criteria may affect the convergence of economies in which the investment is reduced. On the other hand, application of lax fiscal policies, completed in creating sustainable deficits may contribute to faster structural adjustment of these economies to EU requirements.

Also, by the reduction of the inflation rate, real interest rates are increased, resulting in attracting foreign capital and, finally, appreciation, with negative effects on net exports.

#### **4. Sustainability of convergence in the context of economic cycles**

Deficient aspects of the convergence criteria are highlighted especially in the context of economic cycles. Essentially, the Treaty of Maastricht required the fulfillment of pre-set values of a series of macroeconomic indicators, without involving a possible adaptation depending on the specifics of their business cycle. Economy as a whole is a living system, which is in constant transformation, marked by cyclicity; macroeconomic developments are influenced by different phases of economic cycle, which creates difficulties in the capacity of Member States to meet on an ongoing basis a set of strict parameters with conservative margin of variation.

From this perspective, we noted a significant discrepancy between the real economy and the system of nominal convergence indicators. The configuration of these indicators does not take into account cyclical economic developments and implicit changes in macroeconomic indicators.

Another problematic aspect of the economic convergence indicators is the manner in which they correlate with economic cycles within the Member States. The theory of optimum currency areas (OCA) is in fact the rationale of the euro area creation. Founded by Mundell (1961) and

McKinnon (1963) and expanded later by Kenen (1969) and Krugman (1991), the theory has brought to the fore the benefits of participation in an optimum currency area. These advantages are achieved in the context of some compromises, that consist in fact in sacrificing the autonomy of monetary and exchange rate policy. The current imbalance in Greece has been explained by many specialists through the absence of major levers of macroeconomic intervention, namely the inability to use macroeconomic policy tools. Theorists have contended that the inconvenience of giving up these levers of macroeconomic nature can be overcome through the synchronization of business cycles. There is a consistent literature on the subject, numerous studies focusing mainly on three aspects (Cuaresma, 2011):

- ♣ Member States prefiguration as a cellular structures with a core (composed of the euro area) and an area of peripherals based on several circular levels (the new Member States recently integrated) bringing forth an economic stratification even in the nucleus area in terms of synchronization cycles; from this perspective there has been remarked a stronger correlation between Belgium, France, Germany, Luxembourg and the Netherlands and the entire euro area;

- ♣ the impact of the euro area enlargement through the integration of the Central and Eastern Europe countries on the harmonization of economic cycles in the EU;

- ♣ highlighting the two components of the business cycles synchronization, respectively the idiosyncratic component, determined by certain features of the macroeconomic environment in these countries, as well as the systemic components, generated by developments at the global level.

In order to assess the degree of synchronization in the EU, based on quarterly series of the GDP / capita indicator reflecting the sigma convergence, research has developed an empirical perspective based on the key indicator of the real convergence process. A high degree of convergence in the EU involves reducing disparities between countries by the harmonization of the GDP / capita indicator; on the other hand, as we showed in the analysis of the convergence criteria in the EU, there are still significant gaps at the level of country development. In this regard, it is significant to consider the dispersion corresponding to this indicator. An important dispersion of the indicator may reveal a catching tendency for countries in Central and Eastern Europe, and a comparative analysis in relation to the dispersion of the euro area may reveal a trend towards economic cycles harmonization.

In a first step we analyzed the dispersion of the GDP / capita in the new Member States integrated in 2004, in the EU27 and in the euro area. Similarly to the analysis on nominal and real convergence indicators, dispersion corresponding to the analysed regions was calculated based on the weighted indicator, taking into account the contribution of each country's GDP in the total EU27 GDP in order to properly adjust the indicator in the sense of differentiation depending on the degree of EU countries development.

This methodology was developed in line with the critical aspects of the convergence criteria, which highlighted the calculation of the linear convergence indicators in the region without taking into account the possible differentiation according to the criteria of qualitative or quantitative nature. In essence, determining a weighted average as opposed to a simple arithmetic average value adds information. Dispersion of the GDP / capita in the analyzed regions was determined on a quarterly basis.

In Fig. no.1 we noticed a high level of heterogeneity at the level of the sigma convergence. From a global perspective in the EU27, a sustained convergence process is remarked until 2005; in this period, the gap between the EU27 countries fell significantly while subsequently the rate of convergence decreased.

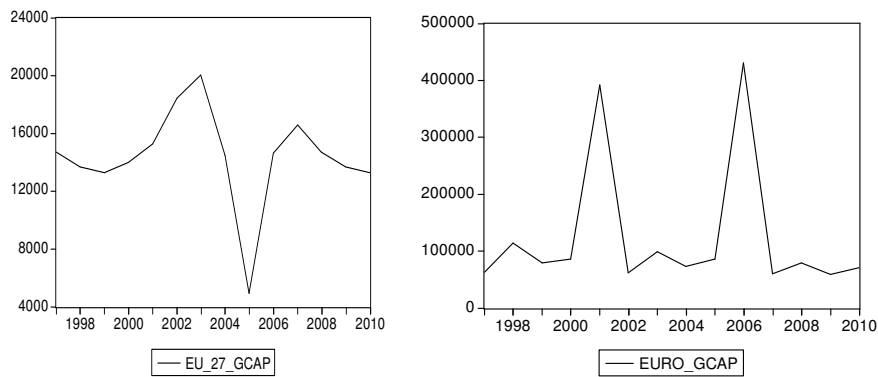


Fig. 1. The evolution of the sigma convergence at the level of the UE27 (left side) and at the level of the euro area (right side)

The trend of dispersion reduction occurs in 2006 until mid 2007. This can be interpreted in terms of enlargements in 2004 and 2007 where the integration of many countries led to enhanced disparities. The same

dynamic is observed in the corresponding sigma convergence process in the euro area; the rate of convergence decreases under the impact of the euro area enlargement, namely the integration of new member leads to enhanced asymmetries between the Member States in terms of development levels.

In the new Member States, the dynamic of the sigma convergence is fluctuating; until 2005, differences from state to state are noted while in the outbreak of financial turmoil, the convergence process gets a downward trend (see fig . 2). Unlike the euro area, where certain fluctuations are also noted, in the new Member States, the period of recovery, reflected in a downtrend of the sigma convergence is longer. In the euro area the fluctuations occur on a more limited period, reflecting the ability of these countries to absorb quickly the differences between states.

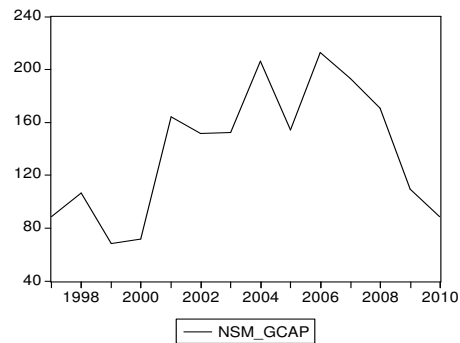


Fig. 2. The evolution of the sigma convergence at the level of the NMS (2004)

Sustainability of the convergence criteria can be assessed from the perspective of sustainable economic convergence process, which involves an analysis of the manner in which the phenomenon of convergence reacts on the spur of certain external shocks. In essence, the idea of sustainability can be highlighted significantly in correlation with certain extreme events since an indicator is sustainable on the condition that the production of a shock (or an event with negative connotation) does not cause an important mutation on the dynamics of the indicator. If sigma indicator proves to be stationary, any shock is absorbed without determining important structural breaks, with negative effects on sustainability.

In this sense, stationarity tests were performed (listed in Annexes No.1-3) at the level of the sigma convergence indicator corresponding to the EU27, to the euro area and the new Member States incorporated in 2004; the results reveal a high degree of heterogeneity. In the EU27 and the euro area,

sigma convergence indicator turns out to be a stationary, while in the new Member States incorporated in 2004, the indicator is non-stationary, which points out that in countries from Central and Eastern Europe, the macroeconomic environment is characterized by fragility. Macroeconomic structures are still weak, vulnerable to certain shocks which, unfortunately, are not absorbed quickly, but propagate on a longer period of time.

Unlike the new Member States incorporated in 2004, euro area countries have stronger economic structures, which gives them the ability to absorb shocks quickly, without long-term repercussions. The experience of the financial crisis confirms this hypothesis, reflecting a significant capacity of the euro area countries to return to the growth trend at a faster pace in comparison with the countries of Central and Eastern Europe, where the imbalances generated by the economic crisis have been spread over a longer period, requiring a more extended period of time to return to this trend.

From this perspective, the convergence process is not characterized by the same degree of sustainability in the two regions, the countries of Central and Eastern Europe, sustainability is lower, demanding such a differentiation of the convergence criteria according to the specific economic structures .

In the second stage, based on use of the Hodrick-Prescott filter, we estimated the economic cycles of countries recently integrated and their correlation with the euro area business cycle. In Fig. 3, we notice the dynamic of the long-term component and a cyclical component in the countries of Central and Eastern Europe. Considering how the two components evolve from one country to another, we can appreciate a possible similarity between macroeconomic developments in these countries and, in essence, the synchronization of business cycles.

Long-term component was estimated for each new Member States incorporated in 2004 and at a regional level; for a comparative perspective, this filter has been applied at the regional level in the case of EU27 and the euro area.

Analysis at the regional level reveals a clear de-correlation of economic cycles from the new Member States, EU27 and the euro area.

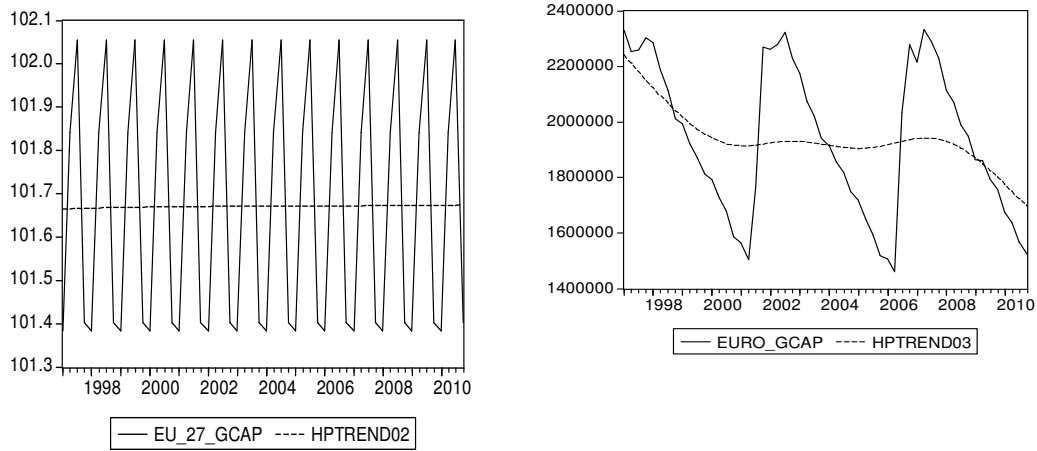


Fig. 3. HP filter applied at the EU27 (left side) and euro zone (right side)

Long-term component of the EU27 follows a linear trajectory, unlike the corresponding new Member States and the euro area; in the new Member States, long-term component follows an upward trajectory, reflecting the continuity of the catching-up process, while at the level of the euro area, there is a more erratic trajectory (see Fig. 3 and 4).

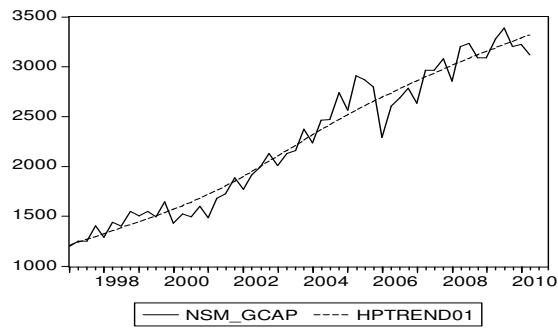


Fig. 4. HP filter applied at the level of the NMS

Bulgaria follows closely the trajectory of the new Member States at the global level, as opposed to the other new Member States that deviate from the line highlighted at the global regional level. In terms of the correlation between economic cycles, we noted that Bulgaria is correlated to



some extent with Hungary and the Baltic countries while Lithuania and Latvia are linked in a more meaningful way.

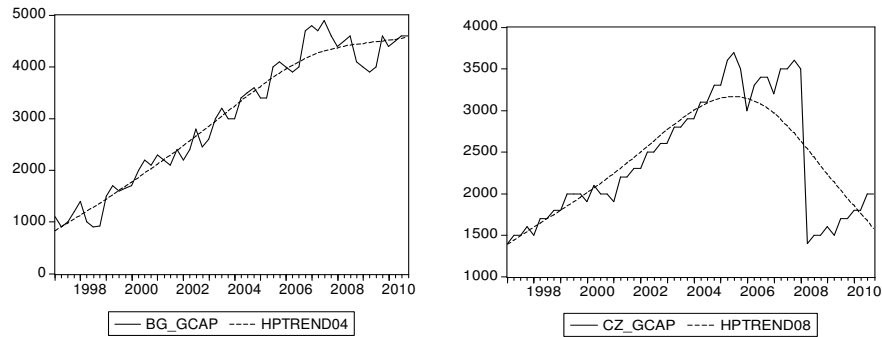


Fig. 5 HP filter applied at the level of Bulgaria (left side) and Czech (right side)

Poland and Romania are clearly decorelated with other countries, presenting a long-term dynamic component different from other countries (see fig. 5-7).

The correlation of business cycles between new Member States and the euro area is virtually nonexistent, revealing the total de-synchronization between the two groups of countries.

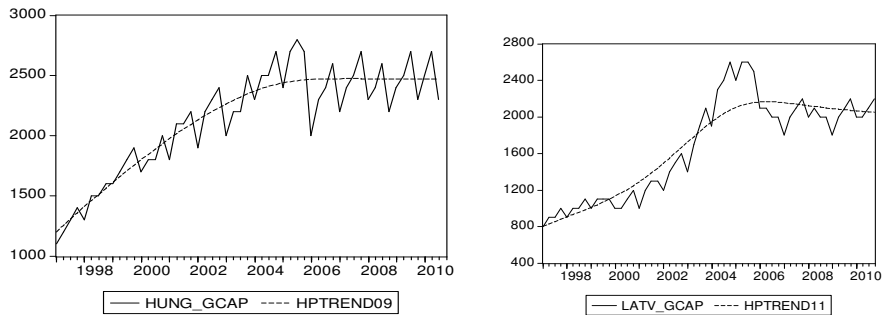


Fig. 6. HP filter applied at the level of Hungary (left side) and Latvia (right side)

In this manner, the optimal character of the euro area is questionable, as the benefits brought for the adoption of the single currency alleviate under the impact of an absolute decoupling between the business cycles in EU countries. From this perspective, the appropriateness of the convergence criteria in its current form can be contested on the basis of the empirical evidence, resulting from quantitative analysis at the level of the business cycles correlation in the EU.

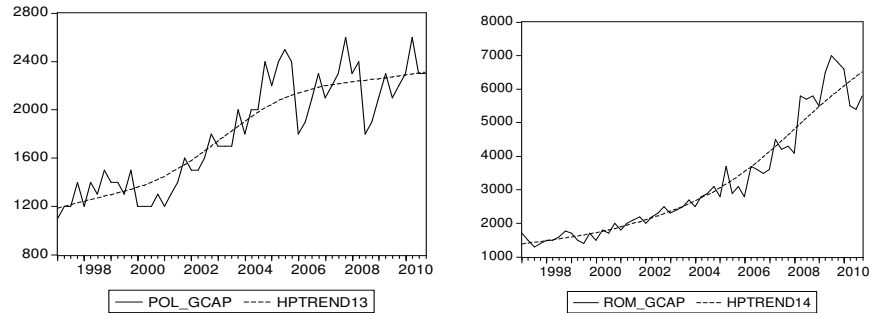


Fig. 7. HP filter applied at the level of Poland (left side) and Romania (right side)

This deficiency of the euro area can be overcome by the harmonization of economic cycles. In the light of recent macroeconomic developments, nominal convergence criteria have shown poor side in this respect, being unable to make a significant contribution to the business cycles synchronization by setting pre-established levels.

Recent experiences have revealed that although several countries meet the nominal convergence criteria as a whole, they do not automatically generate business cycles harmonization and, in essence, the valorization of the single currency positive aspects.

In this context, a viable technique can be represented by an enhanced convergence at the level of real convergence indicators or redefining a more complex set of indicators, reflecting the junction between the two types of convergence. The literature highlighted key areas that without necessarily being encrypted as an indicator of quantitative origin could facilitate the synchronization of business cycles in the EU (Cuaresma and Amador, 2010). Essentially, there are significant disparities between Member States' economic cycles that can be explained by the consistent asymmetries in these areas.

Among these, we can mention the following:

- financial integration, namely the creation of an EU-wide harmonized financial environment without significant discrepancies from one state to another in the degree of development of banking system (Caporale and Soliman, 2009). Afonso and Furceri (2008) have emphasized that an increased level of financial integration leads to synchronization of real economies, with a positive impact on production structures;

- mobility of production factors considered as acting favorably towards shock mitigation at the country level, through the free circulation of the labor force to move in a country unaffected by macroeconomic turbulence and to help restore balance in the macroeconomic plan, avoiding a massive exchange rate depreciation or strong inflationary pressures (Lei et. al, 2008);
- wages and prices flexibility considered to be beneficial since it allows adjustments both at regional and country level, following the event of shocks, thereby avoiding unemployment or inflation (and Stehrer Foster, 2007);
- openness of the economy, with positive effects on trade and foreign direct investment, seen as economic growth promoters and thereby accelerators of the catching up process (Jarocinski, 2010);
- similarity of production structures perceived as a harmonizing factor in the level of economic development and and evenly as a shock mitigant (Mayes and Viren, 2009);
- integration of fiscal policy considered as an element favoring the harmonization of economic policies and implicitly of the economic cycle (Fidrmuc and Korhonen, 2006).

In the section devoted to the analysis of real convergence criteria, we showed that in the areas of real convergence, in the EU27 major disparities attracting a de-correlation of economic cycles is remarked. In essence, the de-synchronization between the emerging countries and the euro area and globally between EU27 and each of the two groups of countries, namely the new Member States integrated in 2004 and the euro area, can be explained in terms of notable differences that exist in these countries, which in the context of the findings in the literature can be considered as linking areas between nominal convergence and real convergence.

The real challenge lies in identifying sets of indicators to ensure relations between the two areas of convergence. I think that the identification of quantitative indicators can not be a panacea for addressing these concerns, but rather the creation of complex systems of indicators, based on a joint between quantitative and qualitative dimension.

## **Conclusions**

The study showed the limitations of nominal convergence criteria in terms of indicators dynamic corresponding to the EU15 and to the new Member States over the last ten years.

The assessment of the EU Member States' ability to meet the euro area criteria in terms of a series of nominal indicators totally scattered with respect to real convergence is poor because of recent financial turmoil came amid a massive de-correlation between nominal economy, reflected in the financial flows and real economy, as evidenced, among other things, in the volume of goods and services produced, and in the living standards (Iancu, 2011). Thus it was necessary to correlate the real and nominal convergence criteria, namely the creation of an integrated system, including indicators anchored in both types of convergence.

Critical issues captured in the nominal convergence indicators focused on a stronger correlation with the real convergence indicators (eg inflation rate must be correlated with the velocity of money) so as to achieve a mix between the two types of convergence.

On the other hand, we emphasized the need to extend the ranges of the Maastricht Treaty strictly imposed indicators in order to adapt them to actual macroeconomic conditions so as to avoid certain macroeconomic slippages due to conflicting relationship created between pre-determined values of nominal convergence indicators.

Analysis of the business cycles synchronization reveals a clear decoupling between countries belonging to the euro area and the new Member States and between new Member States, which largely explained the absence of junction between the two types of convergence.

Future studies will focus on deepening the critical aspects of convergence indicators in terms of interference with the banking system.

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**Annex No.1**

The statistic output of the stationarity tests at the EU level

Null Hypothesis: EU\_27\_GCAP\_SIGMA has a unit root  
 Exogenous: Constant  
 Lag Length: 1 (Automatic based on SIC, MAXLAG=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.478347	0.0026
Test critical values: 1% level	-3.831511	
5% level	-3.029970	
10% level	-2.655194	

\*MacKinnon (1996) one-sided p-values.

Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(EU\_27\_GCAP\_SIGMA)  
 Method: Least Squares  
 Date: 06/26/11 Time: 23:24  
 Sample(adjusted): 1992 2010  
 Included observations: 19 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EU_27_GCAP_SIGM A(-1)	-1.261376	0.281661	-4.478347	0.0004
D(EU_27_GCAP_SIG MA(-1))	0.495366	0.217171	2.280996	0.0366
C	18457.32	4158.944	4.437982	0.0004
R-squared	0.564592	Mean dependent var		55.41704
Adjusted R-squared	0.510165	S.D. dependent var		3930.156
S.E. of regression	2750.645	Akaike info criterion		18.82100
Sum squared resid	1.21E+08	Schwarz criterion		18.97012
Log likelihood	-175.7995	F-statistic		10.37355
Durbin-Watson stat	2.207244	Prob(F-statistic)		0.001292

## Annex No.2

The statistic output of the stationarity tests at the euro zone level

Null Hypothesis: EURO\_GCAP\_SIGMA has a unit root  
Exogenous: Constant  
Lag Length: 0 (Automatic based on SIC, MAXLAG=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.177244	0.0005
Test critical values: 1% level	-3.808546	
5% level	-3.020686	
10% level	-2.650413	

\*Mackinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(EURO\_GCAP\_SIGMA)  
Method: Least Squares  
Date: 06/26/11 Time: 23:25  
Sample(adjusted): 1991 2010  
Included observations: 20 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EURO_GCAP_SIGM	-1.194846	0.230788	-5.177244	0.0001
A(-1)				
C	152579.0	40869.24	3.733346	0.0015
R-squared	0.598249	Mean dependent var	414.9135	
Adjusted R-squared	0.575929	S.D. dependent var	195024.5	
S.E. of regression	127001.3	Akaike info criterion	26.43642	
Sum squared resid	2.90E+11	Schwarz criterion	26.53600	
Log likelihood	-262.3642	F-statistic	26.80386	
Durbin-Watson stat	2.069554	Prob(F-statistic)	0.000063	

**Annex No.3**

The statistic output of the stationarity tests at the NMS level

Null Hypothesis: NSM\_GCAP has a unit root

Exogenous: Constant

Lag Length: 4 (Automatic based on SIC, MAXLAG=10)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.953925	0.7623
Test critical values: 1% level	-3.571310	
5% level	-2.922449	
10% level	-2.599224	

\*Mackinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(NSM\_GCAP)

Method: Least Squares

Date: 06/26/11 Time: 23:32

Sample(adjusted): 1998:2 2010:2

Included observations: 49 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NSM_GCAP(-1)	-0.025392	0.026619	-0.953925	0.3455
D(NSM_GCAP(-1))	-0.214241	0.136198	-1.573013	0.1230
D(NSM_GCAP(-2))	-0.101562	0.136193	-0.745720	0.4599
D(NSM_GCAP(-3))	-0.224987	0.140011	-1.606924	0.1154
D(NSM_GCAP(-4))	0.528161	0.137392	3.844198	0.0004
C	95.22044	62.41648	1.525566	0.1344
R-squared	0.576384	Mean dependent var		37.30364
Adjusted R-squared	0.527127	S.D. dependent var		170.3576
S.E. of regression	117.1477	Akaike info criterion		12.47903
Sum squared resid	590114.3	Schwarz criterion		12.71068
Log likelihood	-299.7361	F-statistic		11.70142
Durbin-Watson stat	1.644163	Prob(F-statistic)		0.000000