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An Analysis Regarding the Fulfilment of the Nominal Convergence Criteria in the New Member States of the European Union in the Context of the Current Financial Crisis

Alina Georgeta AILINĂ, Camelia MILEA, Floarea IORDACHE
Financial and Monetary Research Center „Victor Slăvescu”, Bucharest, ROMANIA
alinailinca@gmail.com,
camigheorghe75@gmail.com

Abstract: *Reaching a sustainable level of nominal convergence is a requirement for all new European Union Member States (NMS) in the process of euro adoption, without it being impossible to join the euro area. The increased importance of nominal convergence, together with an advanced level of real convergence, seem to be for the European Union institutions, including the European Central Bank (ECB), a necessary and sufficient guarantee for entering into the European Monetary Union (EMU) without any additional subsequent problems. However, it is not clear the manner in which a country is or is not selected for entering into the EMU, the decision-making process being insufficiently transparent, some countries have been unprepared from the economical point of view, but have been accepted (e.g. Greece), while others have been rejected due to a lack of credible and sustainable convergence of some criteria (e.g. Lithuania). Thus, this article proposes an analysis of the fulfilment of the nominal convergence criteria through a personal methodology presented in other previous studies. It aims at facilitating the understanding of the extent to which the NMS are convergent in the context of the current economic and financial crisis.*

The article does not propose an exhaustive treatment of the subject, but it can be a good starting point for the evaluation of the European Union old Member States' (OMS) nominal convergence, especially since in these countries it currently occurs a public debt crisis (e.g. Greece, Italy, Spain).

Keywords: *Nominal convergence, new Member States, European integration.*

Introduction

In order to achieve full integration into the European Union, joining the euro area requires simultaneous fulfillment of the minimum economic criteria known as the nominal criteria of convergence or criteria of nominal convergence. Thus, the new Member States, after periodic evaluations in the form of convergence programs, must prove to European institutions and to others member states, a proper performance of macroeconomic parameters in order to join the euro area, which was considered not long time ago extremely exclusive.

The global economic and financial crisis has affected several aspects of the euro area; therefore a qualitative analysis of the progress towards fulfilling nominal convergence criteria in the new Member States, in relation to the objectives imposed by the adhesion to the third stage of the European Monetary Union, is extremely interesting in the current context. Also, in this period still ruled by uncertainties, risks and concerns about the future of the euro area, an analysis of the nominal convergence criteria' fulfillment by the old Member States (OMS) of the EU could be extremely relevant, but this study currently is not within the scope of our research.

Methodology and Study Results

Using the data from the Convergence Report of the European Central Bank (ECB) from May 2010, we realize, based on a methodology presented in a previous study [1], an assessment of a global index of convergence, in order to allow a better comparative analysis of the nominal convergence indicators from NMS.

The qualitative framing used in this article describe the assessment "parameters" of the nominal convergence criteria, based on the nominal convergence criteria already established by the European

Union, without attempting to revise them methodologically. Thus, based on the information provided by the ECB's Convergence Report from May 2010, we use a set of relative indices of nominal convergence that we will enframe into scales of intensity ("divergent", "highly divergent", "convergent", "highly convergent" and "optimal"), in order to notice easier both the possible overruns of the limits and also the hierarchy of NMS in the convergence process.

We develop indices of nominal convergence for each nominal convergence criterion, they representing the values recorded by the NMS divided by the reference values provided by the ECB for the periods chosen for evaluation.

Specifically, the index of price stability for the inflation measured by the HICP (Harmonized Index of Consumer Prices) is $I_{HIPC} = x_{ik}/y_k$, where: x_{ik} is the value of the average annual percentage change of inflation, i reports to the country assessed in period k , namely during the period April-March of the years 2007-2010, and y_k is the reference value, which applies to the period k , namely April-March of the years between 2007-2010, for HICP inflation.

The index on long-term interest rate according to the Maastricht criterion is $I_{MLTIR} = m_{ik}/n_k$; where m_{ik} is the value of the average annual percentage changes of the long-term interest rate, and i reports to the country assessed in the period k , namely during the period April-March of the years 2007-2010. n_k is the reference value for the interest rate, which applies to the period k , April-March of the years in the period 2007-2010, according to the interest rate criterion.

The index of the government deficit or surplus, $I_{GDE} = s_{ik}/t_k$, reflects the weight s_{ik} (where i reports to the country assessed and k to the entire calendar year, in the period 2008-2010), namely the surplus or deficit of the government budgetary position as percentage of GDP, in t_k (the reference value of -3% of GDP). The index of gross public debt is $I_{GPD} = u_{ik}/v_k$, where u_{ik} is the debt of i country in the period k (years in the period 2008-2010), and v_k is the reference value for debt, which is of 60% of GDP.

For evaluation, we use the following table:

Economic indicators of convergence

Table 1

Country	Year	Price stability	Government budgetary position		Exchange rate		Long-term interest rate
		HICP inflation ¹	General government surplus (+) or deficit (-) ²	General government gross debt ²	Currency participating in ERM II ³	Exchange rate vis-à-vis euro ⁴	Long-term interest rate ⁵
Bulgaria	2008	12.0	1.8	14.1	No	0.0	5.4
	2009	2.5	-3.9	14.8	No	0.0	7.2
	2010	1.7	-2.8	17.4	No	0.0	6.9
Romania	2008	7.9	-5.4	13.3	No	-10.4	7.7
	2009	5.6	-8.3	23.7	No	-15.1	9.7
	2010	5.0	-8.0	30.5	No	2.9	9.4
Czech Republic	2008	6.3	-2.7	30.0	No	10.2	4.6
	2009	0.6	-5.9	35.4	No	-6.0	4.8
	2010	0.3	-5.7	39.8	No	2.6	4.7
Estonia	2008	10.6	-2.7	4.6	Yes	0.0	... ⁶
	2009	0.2	-1.7	7.2	Yes	0.0	... ⁶
	2010	-0.7	-2.4	9.6	Yes	0.0	... ⁶
Latvia	2008	15.3	-4.1	19.5	Yes	-0.4	6.4
	2009	3.3	-9.0	36.1	Yes	-0.4	12.4
	2010	0.1	-8.6	48.5	Yes	-0.4	12.7
Lithuania	2008	11.1	-3.3	15.6	Yes	0.0	5.6
	2009	4.2	-8.9	29.3	Yes	0.0	14.0
	2010	2.0	-8.4	38.6	Yes	0.0	12.1
Hungary	2008	6.0	-3.8	72.9	No	-0.1	8.2

	2009	4.0	-4.0	78.3	No	-11.5	9.1
	2010	4.8	-4.1	78.9	No	4.5	8.4
Poland	2008	4.2	-3.7	47.2	No	7.2	6.1
	2009	4.0	-7.1	51.0	No	-23.2	6.1
	2010	3.9	-7.3	53.9	No	8.4	6.1
Reference value⁷	April 2007– March 2008 ⁷	3.2%	-3%	60%	-	+/-15%	6.5%
	April 2008– March 2009 ⁷	4.0%	-3%	60%	-	+/-15%	5.8%
	April 2009– March 2010 ⁷	1.0%	-3%	60%	-	+/-15%	6.0%

Source: European Commission (Eurostat) and ECB, May 2010 Convergence Report.

Legend: 1. Average annual percentage change. Data for 2010 refer to the period April 2009-March 2010.

2. As percentage of GDP. Data for 2010 are taken from European Commission spring 2010 forecasts.

3. Information for 2010 refers to the period until the cut-off date for statistics (23 April 2010).

4. Average annual percentage change. Data for 2010 are calculated as a percentage change of the average over the period 1 January 2010 - 23 April 2010 compared with the average of 2009. A positive (negative) number denotes an appreciation (depreciation) vis-à-vis euro.

5. Average annual interest rate. Data for 2010 refer to the period April 2009-March 2010.

6. For Estonia no long-term interest rate is available.

7. Authors' calculations for 2009 reference value. The reference values refer to the period April – March from 2007-2010 period for the HICP inflation and long-term interest rates from the ECB Convergence Reports for the years 2008 and 2010.

The result obtained after refinement are shown in the following table:

Calculation of nominal convergence assessment indices

Table 2

Nominal Convergence Assessment Indices		Price stability	Government budgetary position		Long-term interest rate
		I _{HIPC}	I _{GDE}	I _{GPD}	I _{MLTIR}
Bulgaria	2008	3.75	-0.60	0.24	0.83
	2009	0.63	1.30	0.25	1.24
	2010	1.70	0.93	0.29	1.15
Romania	2008	2.47	1.80	0.22	1.18
	2009	1.40	2.77	0.40	1.67
	2010	5.00	2.67	0.51	1.57
Czech Republic	2008	1.97	0.90	0.50	0.71
	2009	0.15	1.97	0.59	0.83
	2010	0.30	1.90	0.66	0.78
Estonia	2008	3.31	0.90	0.08	...
	2009	0.05	0.57	0.12	...
	2010	-0.70	0.80	0.16	...
Latvia	2008	4.78	1.37	0.33	0.98
	2009	0.83	3.00	0.60	2.14
	2010	0.10	2.87	0.81	2.12
Lithuania	2008	3.47	1.10	0.26	0.86
	2009	1.05	2.97	0.49	2.41
	2010	2.00	2.80	0.64	2.02
Hungary	2008	1.88	1.27	1.22	1.26
	2009	1.00	1.33	1.31	1.57

	2010	4.80	1.37	1.32	1.40
Poland	2008	1.31	1.23	0.79	0.94
	2009	1.00	2.37	0.85	1.05
	2010	3.90	2.43	0.90	1.02

Source: author's calculations

Please remember that in a previous study [1] we suggest for evaluation of each criterion of convergence, a series of scales of classification and also the afferent notation: on a scale from 1 to 4, 1 representing “highly divergent” and 4 meaning “highly convergent” or “optimal”.

In Table no. 3 we present, in a synthetic manner, the measurement and the selected intervals, in order to clarify, as much as possible, our options for these intervals.

Evaluation intervals of the nominal convergence Indices for the inflation I_{HIPC} , for the Maastricht long-term interest rate I_{MLTIR} , for the exchange rate I_{ER} , for the general government surplus / deficit I_{GDE} , for the general government gross public debt I_{GPD}

Table 3

Evaluation of the Index of nominal convergence for HICP inflation, I_{IAPC}	Highly divergent	Divergent	Convergent	Highly convergent
Interval	>2	(1, 2]	(0.5, 1]	[0, 0.5]
Evaluation of the Index of nominal convergence for Maastricht long-term interest rate, I_{MLTIR}	Highly divergent	Divergent	Convergent	Highly convergent
Interval	>2	(1, 2]	(0.7, 1]	[0, 0.7]
Evaluation of the Index of nominal convergence for the exchange rate against euro, I_{ER}	Divergent	Convergent	Highly divergent	Optimal
Interval	> $\pm 15\%$	($\pm 2.25\%$, $\pm 15\%$]	($\pm 1\%$, $\pm 2.25\%$]	[$\pm 0\%$, $\pm 1\%$]
Evaluation of the Index of nominal convergence for the general government surplus / deficit, I_{GDE}	Highly divergent	Divergent	Convergent	Highly convergent
Interval	>2	(1, 2]	(0, 1]	(-2, 0]
Evaluation of the Index of nominal convergence for the general government gross debt, I_{GPD}	Divergent	Convergent	Highly convergent	Optimal
Interval	(1, 2]	(0.5, 1]	(0.25, 0.5]	[0, 0.25]
1. NOT ATION/GRADING	1	2	3	4

Source: author's conception

Thus, for *the criterion on price stability* we have chosen an interval of 1 point for divergence and of only 0.5 points for convergence, preferring to classify the index in “highly convergent“ and respectively “convergent”, in order to grasp the discrete changes in HICP’s variation. In the case of

negative values for inflation (i.e. Estonia in 2010), but closely to 0 value, we considered that that country was still in a situation of strong convergence, having only a momentary slippage, so we left unchanged the general interval of classification ($[0, 0.5]$).

For the *long-term interest rate* we have chosen the same type of classification, except that we have established the intervals of convergence in an asymmetric manner in order to capture the discrete changes near the value of 0.7 of the long-term interest rate nominal convergence index, I_{MLTIR} .

The Index of nominal convergence of the exchange rate, I_{ER} has not been actually calculated, because the reference for this criterion is actually a band of variation of $\pm 15\%$, taking into account the fluctuations against the central parity or, according to ECB, the changes compared to the average exchange rate vis-à-vis euro for the states non-participating in ERM II, therefore, based on the values recorded, NMS have been directly put in the classification scale. For the index of nominal convergence of the exchange rate the choice of the intervals is easily explained by the fact that the value of $\pm 15\%$ is the maximum limit imposed by the criterion on exchange rate variation from the Maastricht Treaty, $\pm 2.25\%$ is a value commonly used in the past during the "monetary snake" mechanism, discreet enough and also relevant for the countries which do not choose a fixed exchange rate, such as countries with a tradition in choosing a floating exchange rate regime (the Czech Republic, Poland, Romania). The value of $\pm 1\%$ is often used as a floatation target, unilaterally, by the new Member States's monetary authorities with a fixed exchange rate regime, especially since targeting the changes of the national currency central parity against euro within a fluctuation range of $\pm 1\%$ in ERMII does not impose ECB any additional obligation. The $\pm 0\%$ is chosen given the fact that some of the NMS use a fixed exchange rate regime or even a currency board, with a strictly agreement of pegging their exchange rates to the European currency.

For the criterion of general government deficit or surplus we preferred a symmetric classification both for convergence and for divergence, namely "highly divergent", "divergent", "convergent" and respectively "highly convergent", considering that there are countries which fit themselves discreet enough both on the one side and on the other side of the nominal convergence index of government surplus / deficit, I_{GDE} . Thus, the values strictly positive and higher than one explain the divergence process, because the benchmark is 3% of GDP for the budgetary deficit and the values under one and respectively lower than minus one, to a maximum of -2 points, explain the process of convergence. The countries that fit lower than minus one point are those countries which generally have sustainable budget surpluses (in this case is, until 2008, Bulgaria and Estonia).

The Index of nominal convergence of the general government gross debt, I_{GPD} was set as "divergent", "convergent", "highly convergent" and "optimal", because the 60% of GDP reference value allows more subtle classification on the convergence side (as in the case of the exchange rate). Therefore, we preferred symmetric intervals of 0.25 points for convergence and intervals of one point for divergence. There are not enough references in the literature in order to fit the index in such margins, but we consider that a value of 0.25 points is sufficiently subtle and also relevant for catching aspects of gross public debt convergence.

In all the three years of analysis, we can calculate an average value of the convergence for HICP, Maastricht long-term interest rate, general government surplus / deficit and general government gross debt. Also, we can make an assessment of the global convergence of each NMS through *a nominal convergence global index* (I_{NC}), both every year and also as an average over three years, for the purpose of facilitating a multi-annual assessment, outlining the sustainability of the convergence process. This index is calculated as the arithmetic average of the notations of all convergence indices for each criterion.

We present the evaluation of each index, and also the synthesized assessments through an index of global nominal convergence, which will allow us to establish a hierarchy regarding the NMS' convergence. Thus, Table 4 shows the results obtained.

Evaluation of the Indices of nominal convergence for the inflation I_{HIPC} , for the Maastricht long-term interest rate I_{MLTIR} , for the exchange rate I_{ER} , for the general government surplus / deficit I_{GDE} , for the general government gross public debt I_{GPD} and for a nominal convergence global index I_{NC}

Table 4

Evaluation of the Indices of nominal convergence, I_{HIPC} , I_{MLTIR} , I_{ER} , I_{GDE} , I_{GPD}		I_{HIPC}	I_{MLTIR}	I_{ER}	I_{GDE}	I_{GPD}	Evaluation of the nominal convergence global index, I_{NC} – average value
Bulgaria	2008	1	3	4	4	4	3.2
	2009	3	2	4	2	4	3
	2010	2	2	4	3	3	2.8
	The three years average index of each criterion	2.0	2.3	4.0	3.0	3.7	3.0
Romania	2008	1	2	2	2	4	2.2
	2009	2	2	1	1	3	1.8
	2010	1	2	2	1	2	1.6
	The three years average index of each criterion	1.3	2.0	1.7	1.3	3.0	1.9
Czech Republic	2008	2	3	2	3	3	2.6
	2009	4	3	2	2	2	2.6
	2010	4	3	2	2	2	2.6
	The three years average index of each criterion	3.3	3.0	2.0	2.3	2.3	2.6
Estonia	2008	1	...	4	3	4	3.0
	2009	4	...	4	3	4	3.8
	2010	4	...	4	3	4	3.8
	The three years average index of each criterion	3	...	4	3	4	3.5
Latvia	2008	1	3	4	2	3	2.6
	2009	3	1	4	1	2	2.2
	2010	4	1	4	1	2	2.4
	The three years average index of each criterion	2.7	1.7	4.0	1.3	2.3	2.4
Lithuania	2008	1	3	4	2	3	2.6
	2009	2	1	4	1	3	2.2
	2010	2	1	4	1	2	2.0
	The three years average index of each criterion	1.7	1.7	4.0	1.3	2.7	2.3
Hungary	2008	2	2	4	2	1	2.2
	2009	3	2	2	2	1	2
	2010	1	2	2	2	1	1.6
	The three years average index of each criterion	2.0	2.0	2.7	2.0	1.0	1.9
Poland	2008	2	3	2	2	2	2.2
	2009	3	2	1	1	2	1.8

	2010	1	2	2	1	2	1.6
	The three years average index of each criterion	2.0	2.3	1.7	1.3	2.0	1.9

Source: author's calculations

Thus, it can be seen that concerning inflation, in 2010, in the top of nominal convergence there were the Czech Republic, Estonia and Latvia. When referring to a three years average index concerning the nominal convergence of HICP, we find that NMS' hierarchy confirms the 2010 evolution, which is: the Czech Republic, Estonia, Latvia, Bulgaria, Hungary, Poland, Lithuania and Romania. It is worth noticing that although the theory claims that an independent monetary policy enables an easier fulfillment of the price convergence, reality shows, at least during this crisis, the fact that few countries, which are targeting inflation and have an exchange rate flexibility, have successfully proved that they comply with the convergence of HICP (e.g. the Czech Republic and to a lesser extent Poland and Hungary).

The long-term interest rate's convergence, according to the indices calculated for 2010, confirms at the top of the countries with good convergence (as in the case of inflation) the Czech Republic. The ranking of the interest rates' convergence indices, computed as a three years average (2008-2010[2]), is: the Czech Republic, Poland, Bulgaria, Romania, Hungary, Latvia and Lithuania.

It may be noted that, regarding the exchange rate, there is a domination of the Baltic countries and Bulgaria in achieving convergence on this criterion, in the secondary places being situated Hungary, the Czech Republic, Poland and Romania.

In 2010, the index of general government deficit's convergence records high values in Estonia and Bulgaria, followed by the Czech Republic and Hungary, at the bottom of the ranking being Poland, Romania, Latvia and Lithuania. The situation is the same for the three years average index.

The index of nominal convergence of general government gross debt, calculated as a three years average, reaches an optimal value only in Estonia, followed closely by Bulgaria. In the ranking follows Romania, Lithuania, the Czech Republic, Latvia, Poland and Hungary.

For 2010, the nominal convergence global index (I_{NC}) reveals the following hierarchy: **Estonia, Bulgaria, the Czech Republic, Latvia and Lithuania, followed at parity by Poland, Romania and Hungary.** This structure is repeated also regarding the three years average (for the period 2008-2010) nominal convergence global index I_{NC} , which confirms a much better preparation of the Baltic countries, Bulgaria and the Czech Republic in achieving a sustainable level of convergence. Hungary, Romania and Poland seem disconnected from the economic and political integration process in the European Union.

Conclusions

The results obtain during our research should not be taken out of the recent crisis context, when it occurs at the national, regional and international level more likely disintegrative forces rather than integrative ones. Although we have focused on developing a methodology meant to capture the process of nominal convergence in the new EU member states (NMS), it might be more useful the assessment of nominal convergence in the old EU members (OMS). Also, in the context of the second wave of the global financial crisis, it should be considered the euro area system disturbances and the perturbations from the euro area towards NMS economies, which are affected by regional and global developments. Therefore, prudence should be exercised in the assessment of NMS' nominal convergence indicators and of the convergence of these new Member States in relation to the euro area countries, especially that in the recent years, in the euro area they have appeared substantial convergence differentials, but also dissimilarities of economic and political objectives.

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