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Empirical investigations for Bulgaria and Romania

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Convergence and shocks in the road to EU: Empirical investigations for Bulgaria and Romania

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Abstract: Despite their progress Bulgaria and Romania significantly differ from the EU economies. In this article, on the basis of the theoretical and empirical achievements of the theory of optimal and (endogenous) currency areas we study to what extent the two South European economies are able to adopt the common economic (and above all monetary) policy of the EU, and to what extent the convergence to the EU stimulates the economic development of these countries. Despite the similarities, the two countries now differ fundamentally in their choice of a monetary regime – while Romania uses inflation targeting and a flexible exchange rate, Bulgaria has adopted a currency board regime. For this purpose we analyze: (i) the degree of nominal, real and financial convergence and synchronization of the economic cycle with that of the European Union (using unconditional β convergence approach). Income and price levels, inflation rate, interest rate, monetary aggregates, credit, productivity etc. are among the studied variables; (ii) the resistance to different external and internal shocks (using VAR model) as well as (iii) the mechanisms for balancing and absorption of these shocks. To give a better comparative picture we compose the panel including Hungary and Czech Republic.

JEL classification: E3, F4, P2

Key words: convergence, shocks, EU enlargement, Bulgaria and Romania

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Introduction

With the expansion of the EU the theoretical and especially the empirical investigations of convergence become of increasing importance². Traditionally this importance is explained by the necessity of the new member states to have similar economic cycles. First, this means that their main economic and financial variables should move as a single one in order for the common monetary policy (and common currency) to have the desired effect. And second this effect has to be symmetrical for the countries in the zone (i.e. the monetary policy transmission effect has to be identical). If convergence and synchrony are relatively weak and the countries are subject to asymmetric shocks, then it is necessary to have well-working alternatives (replacing the exchange rate and the monetary policy) mechanisms for absorption of the shocks (for example free movement of goods and capital, labor market flexibility, structural diversification of the economy, possibilities for redistribution etc.). All these ideas can be found to a certain extent in the frames of the different versions of the optimal currency area theory (classical, endogenous, fiscal etc.³)

The proposed research is not a theoretical one. It has a purely empirical task – to measure the state of convergence of Bulgaria and Romania – the two countries that will last join the EU and later on - the eurozone. On April the 25th 2005 Bulgaria and Romania signed an accession treaty with the EU under which is very likely that they become full members of the EU in January 2007 and of the Eurozone in 2009 – 2010 if things go well will. These are above all political decisions. Despite the progress made by the two countries, they still differ from the European economy as well as from the countries of the first accession wave. Therefore an empirical investigation of the convergence stage of Bulgaria and Romania is of current interest especially while doubts on the readiness of the two countries to join the EU are expressed frequently.

While the empirical research of the first accession wave is abundant, Bulgaria and Romania are the subjects of a few sketchy surveys that are besides a part of a greater study. According to the review (of the empirical research on the correlation of the business cycles in the post-communist countries) done by Fidrmuc and Korhonen (2004), Bulgaria and Romania have been included in just 3 of 27 such studies. The picture is the same concerning the research on convergence of other economic and financial variables (besides those of GDP and income). Analyses exist of course like those of Brada and Kutan (2001, 2002), NOBE (2002), De Grauwe and Schnabl (2004), Suepell (2003), Bolle and Blessing (2005) etc., but these too are not focused on Bulgaria and Romania and do not aim to comprehend wholly the convergence of

² For the discussion of the contemporary state of measuring convergence see Sala-i-Martin (2003).

³ Regarding the evolution and the different versions of the theory of the optimal currency area see the survey of Goodhart (1998), Lafrance and St-Amant (1999), Mongelli (2002) and Horvath (2003), De Grauwe and Mongelli (2005). A complete topology of the problems of convergence of the new and potential members of the EU is exposed in the excellent analysis of von Hagen and Traistaru (2004). There are two very recent studies dealing with the β convergence of transition countries – NOBE (2002), Varblane and Vahter (2005) and Angeloni and al., (2005), Bolle and Blessing (2005).

Bulgarian and Romanian economy⁴. The main objective is the measurement of the real convergence (at the expense of the nominal), whose significance is taking on an increasing importance⁵.

The empirical research on convergence for Bulgaria and Romania is justified not only by the lack of such research but also because of the possibility to compare the successes and failures of the two countries that began from different starting positions and later adopted radically different monetary and exchange rate regimes.

Despite the similarities in the mechanisms of the planned economy Bulgaria and Romania had differences in their initial starting positions⁶. In contrast to Romania, Bulgaria started with a huge foreign debt, accumulated in the second half of the 80's. The shock of the COMECON collapse was also more significant for the Bulgarian than for the Romanian economy. Subsequently, (after the crisis at the end of 1996 beginning of 1997), Bulgaria adopted a currency board and fixed exchange rate (mid 1997) which functions successfully to this day (Nenovsky and Hristov, 2002). On its part Romania which monetary and exchange rate policies were not explicitly declared in the past, now is advancing more and more in the direction of inflation targeting and floating exchange rate (Popa and al., 2002, Popa, 2005)⁷.

Regardless of the differences in the monetary regimes, in the last few years both countries (as a whole this is valid for most of the Balkan countries) have experienced a high credit growth which has provoked specific reactions from the central banks of the two countries. (Duemwald and al., 2002). This credit dynamic raises the question of the relationship between the credit and the two radically different monetary regimes. Thus the measurement of the convergence of the two economies takes on not only a practical but also a certain theoretical importance. The evaluation of the convergence, of the reaction to shocks and the condition of the channels for absorption of these shocks, provides for institutional comparison of the efficiency of the two monetary regimes from the point of view of the accession to the EU and the eurozone. In order to be able to compare the two "lagging behind" countries with those of the first accession wave, where the progress is obvious, we present also the results for Hungary and the Czech Republic.

The article is structured as follows: in the first chapter we briefly discuss some contradictory points regarding the methodology of the convergence and the joint

⁴ An attempt to compare the stage of convergence between Bulgaria and Romania has been made in Nenovsky and Chobanov (2005). Egert (2005) measures the equilibrium exchange rate for Bulgaria and Romania and also contributes to a better understanding of the mechanisms of balancing the two countries with the euro zone.

⁵ Almost lacking is the analysis of the institutional convergence, which gives the frames of both the nominal and the real convergence. The importance of the institutional characteristics of the post-communist countries and their significance for EU accession lies in the foundation of the creation and monitoring of series of indicators of institutional development, for more details see EBRD (2004) as well as Hallet (2004), Freytag (2004), Roland (2005), Back and Laeven (2005).

⁶ For more theoretical and empirical discussion on initial starting position see Back and Laeven (2005).

⁷ See also Daianu and Lungu (2004).

movement in the behavior of the economies. In the second chapter we present the state of convergence (unconditional β convergence) using a panel model and the presence of long term relations (through the method of co-integration) between the main macroeconomic variables grouped as nominal, real and financial. The third chapter presents the reactions of the two economies to external shocks (external shocks are limited to those coming from the European economy). We use VAR methodology. The studied period is mid 1997 – present (1997:Q3 – 2005:Q3) quarterly data (the use of panel model help to overcome the data limitations problem). Finally we discuss the results obtained.

1. Preliminary observations and methodological notes

Despite the differences of the monetary regimes, the two countries have at first sight similar characteristics and give similar results (table 1).

Table 1 Main macroeconomic indicators for Bulgaria and Romania.

	BULGARIA				ROMANIA			
	1997	2000	2002	2004	1997	2000	2002	2004
Economic Growth	-5.6	5.4	4.9	5.6	5.0	8.3	2.1	5.0
Inflation (eop)	547.7	11.3	3.8	4.0	151.3	40.7	17.8	9.3
Budget deficit as % of GDP	-3.1	-0.6	-0.6	1.7	-3.5	-4.0	-2.5	-1.1
Debt as % of GDP	105.1	73.6	54	38.8	16.5	22.7	23.3	18.5
Growth of Broad Money	351.4	31.4	24.1	23.5	104.9	37.8	38.1	39.9
Domestic credit as % of GDP	20.81	17.83	23.68	36.20		11.57	15.63	15.19
Domestic credit Growth	89.5	31.0	27.4	34.2	50.8	11.4	39.8	21.2
Non-government credit	46.7	17.0	44.0	48.6	33.8	30.0	51.1	37.9
Interest Rate	74.2	3.9	4.0	2.6	47.2	35.0	20.4	20.2
Foreign reserve Growth		15.8	12.6	27.7		46.8	27.2	59.3
Current Account as % of GDP	4.1	-5.6	-5.3	-7.5	-6.0	-3.7	-3.3	-5.3 ^(f)
FDI as % of GDP		8.1	5.9	10.9	3.4	2.8	2.5	
FDI as % of GDP	4.9	7.9	5.8	6.7	3.4	2.8	2.5	
Real Effective Exchange Rate 2000=100	82.8	100	109.5	122.6	82.8	100	104.2	109.9
Productivity as % of the EU level ⁸	28.4 ^(e)	31.9	33.2	31.1 ^(f)		28.4	32.7	36.0 ^(f)
Openness of the Economy	111.9	116.8	112.9	127.1	65.4	71.4	76.6	83.5

⁸Labour productivity per person employed (GDP in Purchasing Power Standards (PPS) per person employed relative to EU-25 (EU-25 = 100)); Source: Eurostat

Chart 1 – 6 illustrate the dynamic of some of the main variables for Bulgaria and Romania compared to those of the EU.

Chart 1. Real Income Dynamics in Bulgaria, Romania and the Eurozone



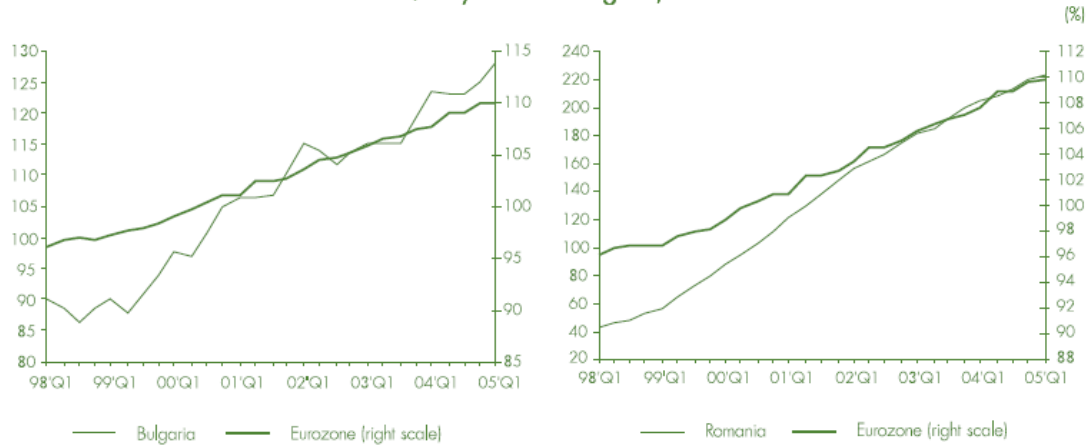
Source: IMF Statistics, BNB data and own calculations.

Chart 2. Interest Rate Dynamics in Bulgaria, Romania and the Eurozone



Source: IMF Statistics, BNB data and own calculations.

Chart 3. General Price Level Dynamics in Bulgaria, Romania and the Eurozone



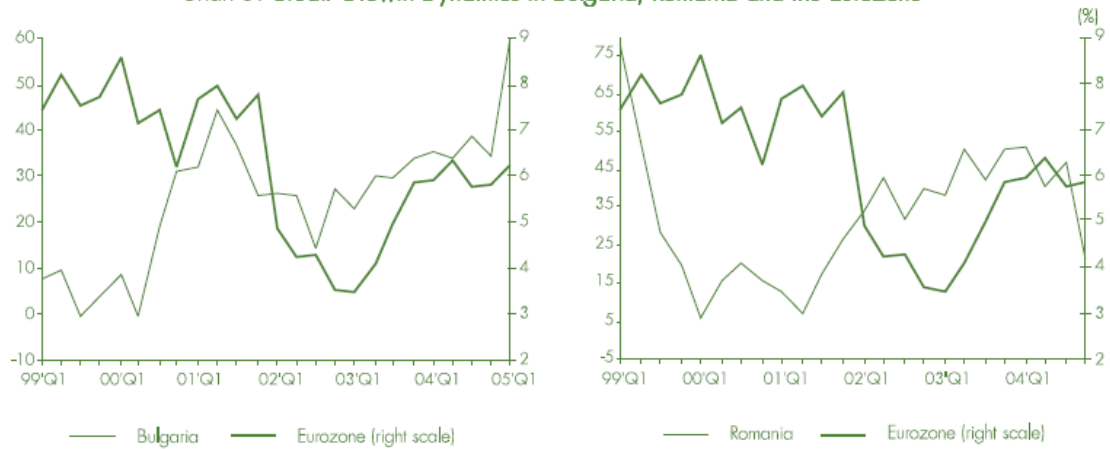
Source: IMF Statistics, BNB data and own calculations.

Chart 4. Inflation Dynamics in Bulgaria, Romania and the Eurozone



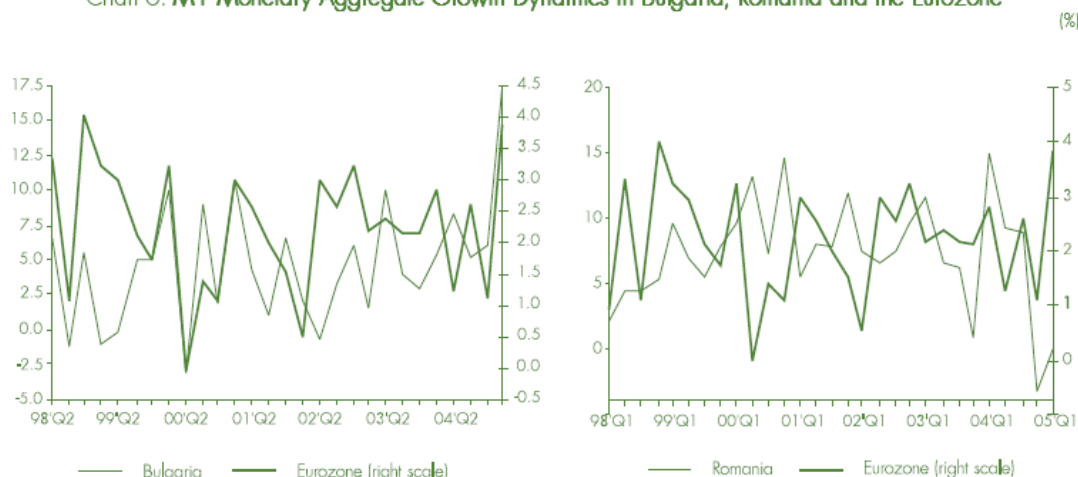
Source: IMF Statistics, BNB data and own calculations.

Chart 5. Credit Growth Dynamics in Bulgaria, Romania and the Eurozone



Source: IMF Statistics, BNB data and own calculations.

Chart 6. M1 Monetary Aggregate Growth Dynamics in Bulgaria, Romania and the Eurozone



Source: IMF Statistics, BNB data and own calculations.

Even though it carries certain information, graphic (visual) presentation of the dynamic of the main variables is not sufficient for in-depth conclusions about the stage of convergence. Therefore we use econometric tests for the existence of a long term correlation (and decrease of the distance) between the dynamic of the variables in the two countries and those of the EU. This directs us straight towards the necessity of discussion of some methodological questions about the convergence and the common movement of the variables.

Box 1: Methodological notes

What we need to note at first is that despite the apparent unity (especially in the empirical literature), the measurement of convergence is not yet fully clarified. This gives us ground for making a stipulation that the calculations we will present cannot claim to be either accurate or indisputable. After this stipulation we have to focus in brief on (i) the unanimity between economists regarding the measurement of the convergence, as well as on (ii) the disputable methodological elements in this measurement.

At first glance, the empirical analyses of the convergence show that almost all of them use three types of methods (i) method of unconditional β convergence (the variables of the poorer countries advance faster than the variables of the richer countries and catch up with them i.e. $\beta < 0$), (ii) of σ convergence (dispersion between the variables in the rich and the poor countries decreases with time $\sigma_{T+t}^2 < \sigma_t^2$) or (iii) method of the conditional β convergence (where structural variables characterizing each country are added to the unconditional model). First applied to economic growth (Sala-i-Martin, 2003), the convergence models are later used to study the problems of economic integration, i.e. applied to series of other variables (such as prices, wages, productivity, financial variables etc.) with the aim of seeing to what extent the countries in a certain integration zone have a tendency to equalize their behavior, to function as a single unit and to have a common monetary policy. For example Mullineux and Murinde (2003) apply this model to convergence of the financial sector of the post-communist economies and in particular of the income of the banks, Holscher (2002) to the behavior of the interest rates and Crespo-Cuaresma and al., (2003) to the study of the regional differences in the EU.

The methods are applied to the study of the common movement of the variables (their levels) as well as to the study only of the cyclical components of these variables (with the aim of

observing the similarity on the economic cycle). In order for the cyclical component to be extracted, various filters are being used, above all HP (Hodrick-Prescott) and BK (Baxter-King). The models are run for separate countries as well as increasingly for groups of countries (panel models with fixed effects for separate countries and groups of countries).

In the present paper we attempt to measure convergence of the main macroeconomic variables with the following panel model:

$$(1) \Delta x_{nt} = \beta_{cn} + \beta x_{nt-1} + \sum_{m=1}^M \gamma_m \Delta x_{nt-m} + \varepsilon_{nt}$$

Where $\Delta x_{nt} = |x_{nt} - x_{EU}|$, stands for the difference between a variable for a certain country and for the EU. βx_{nt-1} stands for the error correction term and β_{cn} is the fixed effect for the constant for each country. In the case of convergence it is expected that β is negative i.e. $\beta < 0$ reducing the distance with the EU.

We consider that the above model can give us an idea of the convergence. Regarding the empiric model, which checks for a presence of co-integration between the variables in the studied countries and the EU, we think that confirming such a connection does not indicate the presence of convergence. We think that Brada and Kutun (2001, 2002) in some respect erroneously interpret the presence of such movement as proof of convergence. In fact these co-integration models do not tell us if the distance between the variables declines, but only that the variables move together i.e. that the connection is stable over the time.

Alongside the traditional division of nominal and real convergence, we also present separately the financial convergence, which shows to what extent the dynamic of the financial sector (and mostly the banks) is similar to those of the European financial sector.

Thus the variables that we have denoted as x in the model: are the following: (i) nominal convergence is reduced to nominal income, price level, inflation and money supply (M1); (ii) real convergence - which has a growing significance - we reduce to real income and productivity; and (iii) regarding the financial variables - we include domestic credit in the private sector and to the behavior of the interest rates on deposits and interest spread (the difference between the interest rate of deposits and the interest rate of credits). Interest spread tells us about the efficiency and the level of integration of the banking system in the EU banking area.

As a whole the logic of the empirical investigation is the consistent. After we have seen the state of convergence (nominal, real and financial) through the described models, we carry out a simulation of shocks on the Bulgarian and Romanian economy, throughout the EU. EU shocks are reduced to the following: (i) demand side shock (real income), (ii) shocks in the monetary policy - interest rates, (iii) shocks concerning inflation and (iv) shocks in the real exchange rate or price differential. We use the methodology of reaction to the shocks in the frame of the VAR models (impulse response). Finally we discuss the state of some of the channels for equilibrating these shocks (in the case of Bulgaria) and summarize the results of the study.

2 State of convergence – interpretation of results

The results of the econometric tests of the panel model (which includes four countries – Bulgaria, Romania, Hungary and the Czech Republic) are summarized in tables 2 and 2a.

As a whole the tests show that some elements of convergence exists with the remarkable exception of Romania, where convergence is present in none of the spheres (the signs of the fixed effects for Romania are positive and often not significant) In contrast to Romania, in Bulgaria nominal convergence is mainly observed – in the nominal income, in the general price level as well as in the behavior of the interest rates and the interest spread. Real convergence for Bulgaria does not exist. Within the frame of the nominal convergence it is interesting that for Bulgaria nominal convergence of the monetary aggregate M1 does not exist. Convergence of productivity is also absent. The difference of these two countries with Hungary and the Czech Republic is obvious: with these countries convergence is observed for almost all spheres with the exception of the interest rates.

The presence of the currency board in Bulgaria is a logical explanation of the strong convergence of the interest rates in Bulgaria (due to the principle of the automatic adherence of the country' monetary policy to the monetary stance of the anchor country (via the fixed exchange rate and monetary base coverage). In general it could be supposed that the currency board regime provides a considerably stronger and faster nominal convergence in comparison to the discretionary monetary regime (Romania)⁹ but it is not a sufficient condition for real convergence (here the set of structural reforms is needed). The latter is determined by a series of other factors, above all microeconomic and structural ones. Concerning the lack of convergence on monetary supply, this lack could be explained with credit dynamics (monetary multiplier) and eventually with the restrictive measures taken by BNB (increase in required reserves)¹⁰. In some respects these measures perturb the automatic link between the foreign reserves and monetary supply (i.e. they have influence on the monetary multiplier).

⁹ The Currency board (similar to the gold standard) possesses two major effects – discipline effect and credibility effect.

¹⁰ On the credit dynamics in Bulgaria and Romania see the IMF study Duenwald and al. (2005).

Table 2 The Results of the tests for unconditional β convergence (model 1)

	nominal			real		financial			
	GDP	Price level	Money aggregate M1	Real GDP growth	Productivity	Credit	Credit for the private sector	Interest rates on deposits	Interest spread
β	-0.496 (-4.269)	-0.245 (-1.682)	-0.540 (-2.610)	-0.065 (-0.377)	0.092 (0.434)	-1.64203 (-2.941)	-0.387 (-1.851)	-0.170 (-1.588)	-0.051 (-1.302)
β Bg	-0.009	-0.010	0.004	0.331	0.003	0.016	0.030	-0.857	-0.470
β Ro	0.036	0.034	0.033	0.110	na	0.034	0.034		0.178
β Cz	-0.020	-0.018	-0.020	-0.100	-0.002	-0.037	-0.063	0.479	0.156
β Hu	-0.006	-0.007	-0.016	-0.312	-0.002	-0.012	0.001	0.378	0.136
Lag									0.286 (3.399)
R2	0.275	0.291	0.273	0.216	0.156	0.235	0.296	0.217	0.376
Prob (F)	0	0	0	0	0	0	0	0	0

Note: t statistics are given in brackets

Table 2a The degree of unconditional β convergence (= table 2)

	nominal			real		financial			
	GDP	Price level	Money aggregate M1	Real growth of GDP	Productivity	Credit	Credit for the private sector	Interest rates on deposits	Interest spread
All four countries	average	weak to average	weak to average	weak	none	weak	average	weak to average	weak
Bulgaria	weak	average	none	none	none	none	none	strong	strong
Romania	none	none	none	none	no data	none	none	no data	non
Czech	average	average	average	strong	weak	average	average	none	non
Hungary	weak	weak	average	strong	weak	average	non	none	non

When we turn towards tests of co-integration between the main variables¹¹ again it can be seen that for Romania, the presence of such a movement is least expressed as well as the restoration towards it (in the case of its existence). Considerably “better” are the results for Bulgaria where as a whole the main macro variables move together with those of the Eurozone and the equilibrium is restored in most of the cases.

¹¹ A similar test with monthly data up to 2004 was carried out by Nenovsky and Chobanov (2005).

Table 3 Degree of common movement of the nominal, real and financial variables

	Price Level	Inflation	Broad Money	Real income	Productivity	Internal Credit	Interest rate
Bulgaria	average 2.8* (18) 3**	none (weak)	strong 2.2 (15.1) 2.5	none	average 6.3 (12.4) 6	average 6.6 (8.9) 14	Strong 0.75 (17.3) 1
Romania	weak 2.9 (4) 50	none	average 3.6 (5.1) 10	none	none	weak 1.4 (34.3) 33	average 9 (6.5) 3
Hungary	average 1 (43) 14	none (weak)	strong 1.6 (26.6) 2	none	average 6 (10.8) 16	average 2.4 (6.1) 8	average 2.3 (3.4) 10
Czech Republic	strong 0.9 (7.7) 3	strong 1.2 (3.9) 2	average 2.1 (10.6) 7	Weak 1.7 (3.6) 20	average 0.2 (0.6) 6	strong 3.4 (4.5) 3	average 2.1 (1.8) 11

* Coefficient of long term equilibrium, () – significance of the connection (*t* statistics)

** Speed of restoration of the equilibrium in quarters

From the econometric simulations as a whole there is no doubt that using either method of analysis of the behavior of the variables (unconditional β convergence and co-integration) Bulgaria shows better achievements than Romania (especially for the nominal convergence) but considerably worse than Hungary and the Czech Republic. The shortfall is considerably greater for the real convergence, which in fact is the major motive for joining the EU.

3 Reactions to shocks and shocks absorption

The next logical step following the basic idea of the optimal currency area theory (OCA) is the simulation of shocks on the Bulgarian and Romanian Economy through the VAR models (impulse response). The impact of the shocks on the real income of the two countries as well as those of Hungary and the Czech Republic are summarized in Table 6.

Table 6
Reaction of the real income in Bulgaria Romania, Hungary and the Czech republic to the shocks coming from the EU (VAR framework)

	Shocks coming from the EU			
	From real GDP	From interest rate	From inflation	From real exchange rate (inflation differential)
Bulgaria	Weak (initially (+), later (-), as a whole neutral effect)	Weak (alternating (+) and (-) effects, slightly positive effect) (note: interest rate has inverse sign)	Weak (initially (+), later (-), as a whole slightly positive effect)	Weak (alternating (-) and (+) effects, as a whole slightly negative effect)
Romania	None	None	None	None
Hungary	Average (initially (+), later (-), as a whole neutral effect)	Average (strongly positive effect)	Weak (negative effect dominates)	Weak (slightly positive effect)
The Czech Republic	Average (initially (+), later (-), as a whole slightly positive effect)	Average (strongly positive effect)	Weak (negative effect dominates)	Weak (negative effect dominates)

Note: The results of the econometric test (VAR, impulse response) are not presented. They are available upon request.

From table 6 we can draw a series of reasoning. The first we see the lack of reaction of the real income in Romania to the shocks coming from the EU. This shows once again that the isolation of the Romanian economy is considerably stronger than that of the Bulgarian. In other words this shows that Romania is more cut off from the European cycle than Bulgaria. Because Bulgaria as a whole has a stronger elasticity towards shocks from the EU its reaction to an eventual common shock affecting them (for example in the petrol prices) would be similar to the European reaction. Bulgaria is coming very close to the Czech Republic and Hungary in its relation to the dynamic of the Euro zone (the reaction to the shocks coming from the EU are very similar to those of the Czech Republic and to Hungary).

Regarding shocks coming from the EU countries (chart 8) the following dependencies are observed. The real income growth in the EU (a part of the external demand for Bulgaria) has a positive effect on the growth of the real income in Bulgaria, even though this shock fades within about a year. After a year a decrease in production is observed and, as a whole, after two and a half years, the original equilibrium is re-established. The net effect of the positive shock in the EU is almost zero (the explanations for this can be different – we will not focus on them).

The changes in prices of the euro zone have a rapid impact on Bulgarian prices via the fixed exchange rate (the equilibrium is re-established). Regarding the changes of the interest rates of the euro zone, representing not only the cycle in the euro zone but also the discretionary policy of the ECB, the shock is neutralized quickly as well although this happens considerably more slowly than the price shock.

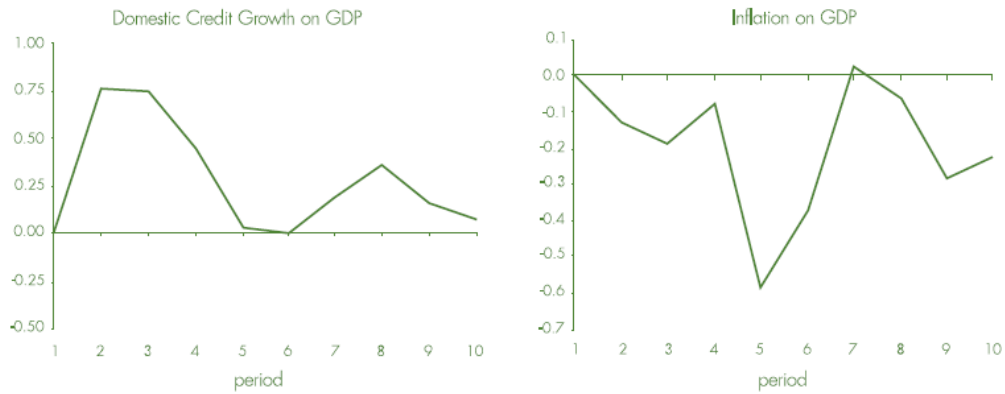
As a whole the real shocks of the ECB explain about 30% of the changes in Bulgarian income. In the frame of this model, the common European external shocks (real income, prices, and interest rate) explain about 50% of the changes in the changes in Bulgarian real income. This is logical when taking into consideration the exposure of the Bulgarian economy to the EU (about 60% of the country's trade).

The inflation differential between Bulgaria and the Euro zone (which reflects to a great extent the dynamic of the real exchange rate of the lev to the euro, and therefore the cost competitiveness) has a very weak influence on the income of the country (the shock is absorbed after about a year) and moreover after great fluctuation. Even the effect of a somewhat convex curve is observed (where at first after a trimester the growth in Bulgaria is slightly improved but afterwards it quickly deteriorates).

Concentrating more on domestic shocks in the case of Bulgaria, we show (chart 7) the reaction of the real income coming to the shocks coming from domestic credit and inflation. The increase of credit has a cyclical impact on income – at first income increases, then its effect equals zero and then it rises again. Or as a whole with all the stipulations it can be stated that credit does not have a long

tem effect on real income. Indisputably, though, inflation has a negative effect on real income.

Chart 7 Domestic shocks on real income in Bulgaria (coming from Credit and Inflation)



Source: NSI, Eurostat and own calculations.

Chart 8 Shocks from the euro zone on real income in Bulgaria



Source: NSI, Eurostat and own calculations

According to OCA theory, when there is a weak convergence of the economy as a whole and a weak integration into the EU and the euro zone, alternative mechanisms are needed for the absorption of the possible asymmetric shocks i.e. other sources for flexibility of the economy. Some mechanisms are presented on box 2.

Box 2 Possible mechanisms for shock absorption (flexibility of the economy)

- 1) Monetary and fiscal policy
 - Currency board stability
 - Public finances and fiscal reserve
- 2) Labor market flexibility
 - Real wages (flexibility of prices and real wages)
 - Labor mobility within the country
 - Migration towards the EU
- 3) Capital mobility and financial system
 - Capital mobility
 - Integration of the bank system
- 4) Openness of the economy, diversification, specialization.
 - Inter-branch specialization (horizontal)
 - Intra-branch specialization (vertical)
- 5) Productivity and competitiveness
 - Productivity and unit labor cost
 - Competitiveness
- 6) Unofficial economy
 - GDP, labor and income
 - Fiscal losses
 - Balance of payments
- 7) Fiscal transfers from the EU
 - Types of funds
 - Ability to absorb them

We turn to Bulgarian case.

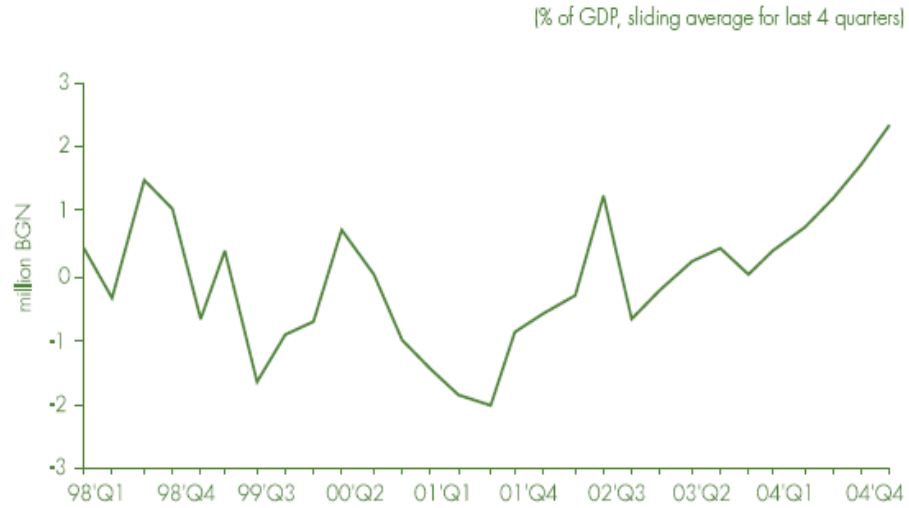
Some comments on the present state of absorption channels in Bulgaria. From the currency board balance sheet perspective, the situation is rather stable. The foreign exchange reserves are 7.3 billion euro (rising more than 10 times since the beginning of Currency board), the monetary base is covered more than 100 % and the fiscal reserve at the central bank reaches 2.4 billion euros.

Insofar as a monetary policy under the Currency board is very restricted, the whole weight of adjustment falls on fiscal balance. Over the last months (after the formation of the big political coalition in Bulgaria) some fundamental questions concerning the fiscal policy have been raised. These questions consider (i) to what extent the policy of financial stability is compatible with economic growth (ii) to what extent it is necessary to keep the equilibrium (and even surplus) of the budget, (iii) to what extent it is useful to keep the fiscal reserve in the form of foreign reserves and (iv) what should be the

expenditure policy (especially the increase in public salaries) and the revenue policy (especially tax changes).

Actually the state of public finance is relatively good, with possibilities to keep the equilibrium into the future¹².

Chart 9: Budget balance (% of the GDP dynamic average for the last 4 trimesters)



Source: NSI, Eurostat and BNB.

Graph 10: Government expenditure (% of the GDP dynamic average for the last 4 trimesters)



Source: NSI, Eurostat and BNB.

¹² According to some studies, the smaller and more open the economy is small, as much, the bigger the public sector is (as % of GDP), Hagen and Traistaru (2005). This could be explained by the fact that through the medium of the public sector (serving as a buffer) the economy can react to eventual external or/and exogenous shocks.

We think that at the moment the fiscal policy should be conservative and reasonable. Practice and theoretical studies show without any doubt that strong fiscal policy and a balanced budget are preconditions for long and sustainable economic growth¹³. There is no possibility of long term influence on saving and investment preferences through public finances, as long as the former determine the conditions of growth. All attempts at artificial stimulation of domestic demand (when domestic saving is very low and where the economy is small and open, eg. Bulgaria) sooner or later will come into conflict with external constraints (eg. impossibility to finance the rising current account deficit)¹⁴. The experience of Portugal, Greece in the past, and that of Hungary during the period 2001 – 2004 (the appearance of the twin deficits)¹⁵ is very eloquent. This logic is far more important for Bulgaria, where under the passivity of the Currency board (very limited possibility to influence the liquidity of the system) fiscal policy takes on directly monetary functions (eg. its impact on interest rates and finally on inflation).

Hence, the indispensability of maintaining a bigger-than-normal fiscal reserve, serving not only to securing foreign debt payments and Currency board guarantee, but also as a buffer from eventual shocks at the moment of EU and eurozone entry, when the fall of duties, the rise of co-financing costs and probably some slow down of the economic growth could be expected. [We calculated the optimal fiscal reserve for the moment (taking the foreign debt payments for the next 4 quarters, assuming the financing of the current account deficit above 5% and 5% economic growth) should be around 2.4b euro (at 12 % current account deficit) and 1.7 billion euro (at 9 %)].

Despite the fact that, as a whole, the labor market in Bulgaria is not very flexible, the productivity and unit labor cost movement have a relatively favorable dynamic (see chart 11 and 12)¹⁶. It can be supposed that the Currency board constraints (via the discipline effect and credibility effect) brought about the rise of productivity and competitiveness of Bulgarian enterprises, forcing them to restructure in order to be competitive. A large part of non-performing enterprises (mainly public one) have ceased to operate, which has raised the general level of productivity of the country. The cost competitiveness, measured by unit labor cost (ULC) has a relatively good dynamic till mid 2002, when the process of restructuring was going strong. These developments undoubtedly make it possible to “resist” in circumstances of slow but steady appreciation of the real exchange rate. The industry and agriculture sectors continue to reduce their ULC, as naturally these costs are lower in agriculture. After mid 2002 in the service sector, we observe a continuous rise of ULC and, because of its large proportion of the total added value, the general picture has deteriorated.

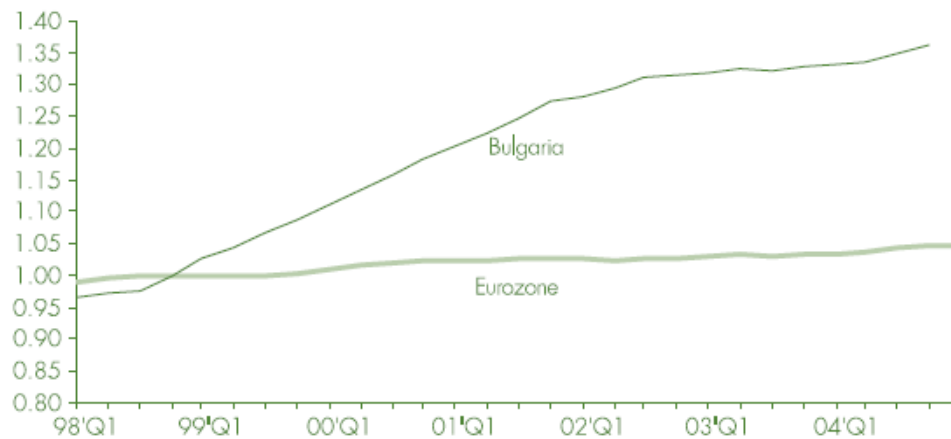
¹³ This was found by many empirical studies. For example Fatas and Mihov (2003) run a panel of 91 countries and found that countries which use actively fiscal policy lose growth and obtain bigger macroeconomic volatility. In a similar vein is a study carried out by Mehrotra and Peltonen (2005) on transition economies, where the authors found that the stronger the fiscal discipline and the fiscal consolidation, the faster is real convergence.

¹⁴ For more details about real convergence, current account deficit and the limits of its financing by foreign saving, see Bolle and Blessing (2005).

¹⁵ For more details see Csaba (2005).

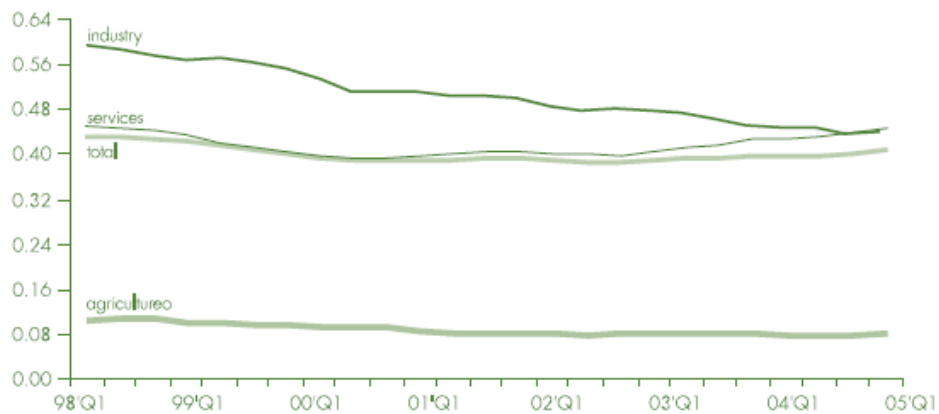
¹⁶ For more details about the evolution of labor market flexibility in Bulgaria see Nenovsky and Koleva (2001)

Chart 11 Dynamic of the productivity in Bulgaria and in the euro zone



Source: NSI, Eurostat and BNB.

Chart 12 Unit labor cost – totally and by sectors



Source: NSI, Eurostat and BNB.

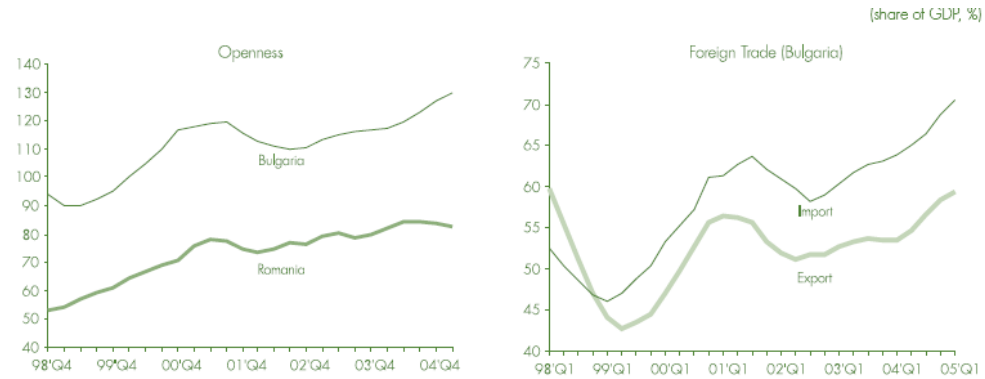
When discussing the rise of public wages, the Hungarian experience struck us immediately as a worse example of such a policy. Raising public salaries without preliminary restructuring of the public sector is a very dangerous step. Moreover, it is considered that the best way to realize fiscal consolidation (that stimulates growth and restrains inflation) is through expenditure cuts, not raising revenues¹⁷.

From chart 13 we can see that the Bulgarian economy is more open than Romania's, placing the state of balance of payment and external debt at the heart of policy making.

¹⁷ See for example Afonso and al. (2005)

The more open is an economy the more vulnerably she is to external (and EU shocks) and the more important is the role of preliminary convergence.

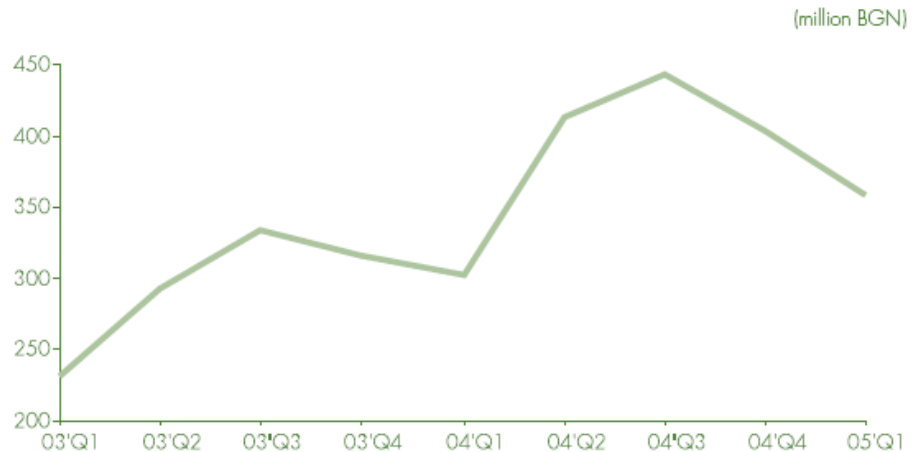
Chart 13 Dynamic of the openness of the economy and international trade



Source: NSI, Eurostat and BNB.

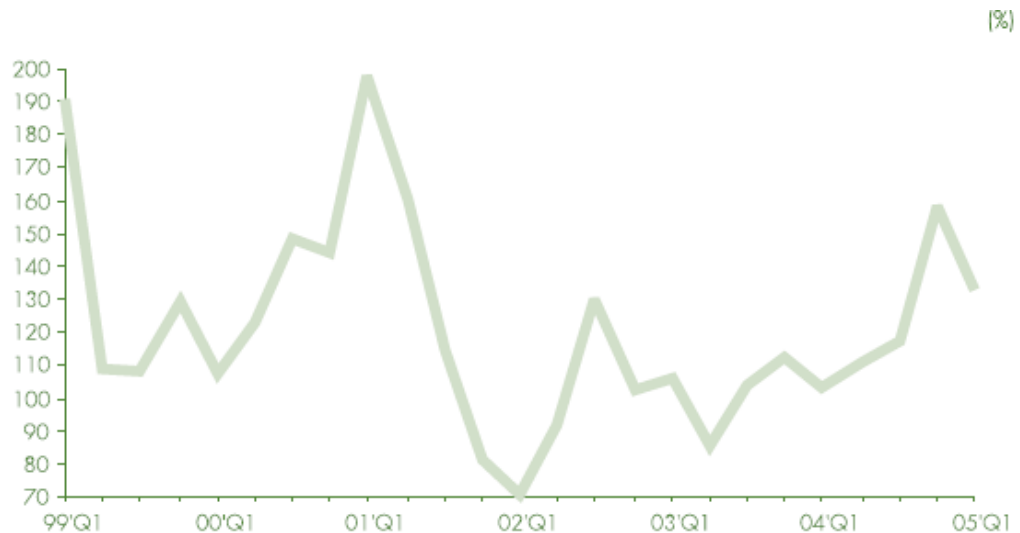
We have already mentioned that because of this openness, as well as because of the need of the Bulgarian economy to catch up with other European economies, consumption and investment grow faster than domestic saving, which logically runs down the current account (because of the import of foreign savings, on which the country should pay interest). This situation raises the question about the sources of current account financing (especially in the frame of a fixed exchange rate and a passive monetary policy).

Chart 14 Private transfers



Source: BNB.

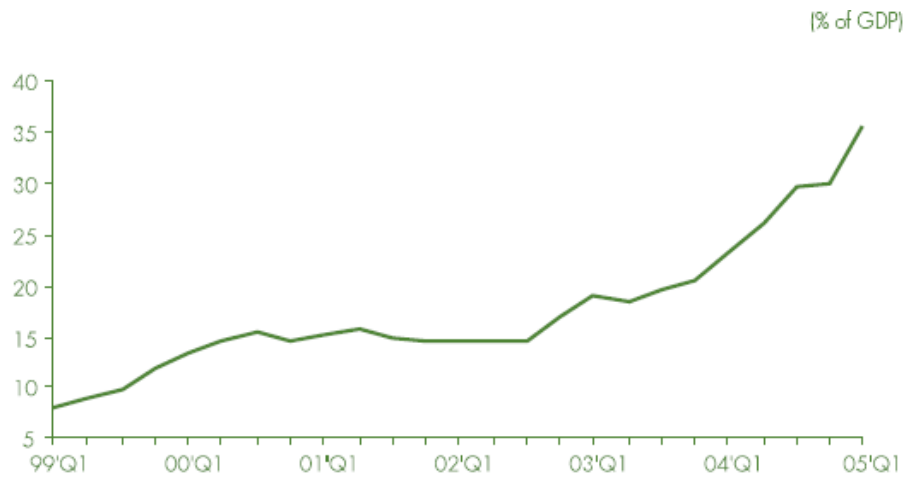
Chart 15 Current account deficit covered by FDI



Source: BNB.

The restrictive measures exerted by bank lending on the real sector (taken by BNB in 2005), as well as the constraint on public finance (coming from the currency board rule and Maastricht criteria), logically led to the rise of private foreign debt, which, at the end of the first quarter 2005 is 36% of GDP. This way we observe a process of transformation of the public to private debt. This is logical if we consider the rising role of the private sector in Bulgarian economy.

Chart 16 Private external debt (% of GDP)



Source: BNB, MF.

The foreign debt structure raises some concerns, not only because the rise of private debt as a whole (which exceeds public debt), but also because of the increase of the short term part of this debt (about 1/4 of the overall debt).

Discussion of results

This paper is an empirical one. We have attempted to measure the convergence and the synchrony of the behavior of the main macroeconomic variables in Bulgaria and Romania as well as the ability of the two economies to react to shocks coming from the EU.

We have carried out: (i) the model of the unconditional β convergence in the frame of a panel of four countries: Bulgaria, Romania, Hungary and the Czech Republic, (ii) a test for common movement of the dynamic of the main variables through a co-integration between the variables of the studied countries and the EU, as well as the speed of re-establishing this long term correlation (error correction term) and (iii) we have simulated shocks with VAR models and finally (iv) we have made some observations on the present state of absorption mechanisms in Bulgaria.

Despite the limitations of the modeling and the difficulties with the interpretation of the results, we could say that Bulgaria is advancing faster than Romania towards its integration into the common dynamic of the European economy. Nevertheless the Bulgarian convergence is mainly in the frame of the nominal variables and is lagging considerably behind with regard to real convergence, which is present in Hungary and the Czech Republic. The nominal convergence is mainly due to the functioning of the currency board, which in general leads to a faster nominal convergence because of the automatic binding of the monetary policy with that of the anchor currency. Romania, which recently started to apply inflation targeting, implements a radically discretionary monetary policy.

Bulgarian economy is much more elastic to EU shocks (including these coming from ECB monetary policy) than Romanian one. We observe some asymmetry of the reaction to the shocks – while the negative shock has a stronger effect on Bulgarian economy than the positive, which despaired very quickly.

We can take comfort from the relatively better state of Bulgaria as far as the mechanisms of adjustment. Here the most important future policy is to save fiscal equilibrium and to accumulate the “above normal” fiscal reserve in order to deal with future shocks related to EU accession.

Of course we have only theoretically ascertained the state of convergence. Another and a much more complicated question is that of to what extent convergence is possible and desired from the point of view of catching up with and joining the euro zone.

Bibliography:

Angeloni, I., M. Flad, F. Mongelli (2005), “ Economic and monetary integration of the new member states. Helping to chart the route”, *European Central Bank Occasional Paper*, n° 36.

Afonso, A., C. Nickel, P. Rother (2005), "Fiscal Consolidation in the Central and Eastern European Countries", *European Central Bank Occasional Paper*, n°473.

Avallone, N., F. Nicolas (2003) Théorie de la croissance: leçons pour les pays en développement. Revue sélective de la littérature théorique et empirique, Caisse des dépôts, *Document de travail*, n°2003-75/EI.

Barro, R., X., Sala-i-Martin (1992) Convergence, *Journal of Political Economy*, Vol. 100(2) pp. 223 – 251

Beck, T. and L. Laeven (2005). Institutional building and growth in transition economies, World Bank Policy Research Working Paper WPS3657

Berend, I. T. (2003), "Past convergence within Europe: core – periphery diversity in Modern Economic Development", in Tumpel-Guerell, G., P. Mooslechner (eds.), *Economic Convergence and Divergence in Europe*, Osterreichische Nationalbank, Edward Elgar Publishing.

Bernard, A. B., S. N. Durlauf (1995), "Convergence of international output", *Journal of Applied Economics*, n°10, pp.97-108

Bolle, M. and J. Blessing (2005), The macro-logic of sustainable convergence in an Enlarged European Union: economic challenges and political responses, Paper presented at the conference "Countries in Transition. Experiences and Challenges of EU Membership" (Sofia, November 17 -19, 2005)

Brada, J., A. Kutan (2002), "Balkan and Mediterranean Candidates for European Union Membership", *Eastern European Economics*, vol. 40 (4), pp. 31- 44

Brada, J., A. Kutan (2001), "The Convergence of Monetary Policy between Candidate Countries and the European Union", *Economic Systems*, vol. 25 pp. 215 – 231

Cscaba, L. (2005), *The New Political Economy of Emerging Europe*, Akademia Kiado, Budapest

Crespo-Cuaresma, J., M. A. Dimitz, D. Ritzberger – Gruenwald (2003), "The impact of European integration on growth: what can we learn for EU accession?" in Tumpel-Guerell, G., P. Mooslechner (eds.), *Economic Convergence and Divergence in Europe*, Osterreichische Nationalbank, Edward Elgar Publishing.

Daianu, D. and L. Lungu (2004) Inflation targeting, between rhetoric and reality. The case of transition economies, paper presented at EACES 8th Conference "EU Enlargement – What comes after 2004?", Belgrade, 23-25 September 2004.

Darvas, Z., G. Szapary (2004), "Business cycle Synchronization in the Enlarged EU: Co movements in the New and Old Members", *Magyar Nemzeti Bank WP*, n°1.

De Grauwe, P, P. Mongelli (2005) "Endogeneities of Optimum Currency Areas: What Brings Countries Sharing a Single Currency Closer Together?", *European Central Bank WP*, n° 468.

De Grauwe, P. and G. Schnabl, (2004), "Exchange Rate Regimes and Macroeconomic Stability in Central and Eastern Europe", *CESifo WP*, n°1182.

- De la Fuente A. (2003) “Regional convergence in Spain 1965 – 95 in Economic Convergence and Divergence in Europe”, in Tumpel-Guerell, G., P. Mooslechner (eds.), *Economic Convergence and Divergence in Europe*, Osterreichische Nationalbank, Edward Elgar Publishing.
- Duenwald, C., N. Guerguiev, A. Schaechter (2005), “Too much of a Good Thing? Credit Booms in Transition Economies: The Cases of Bulgaria, Romania, and Ukraine”, *International Monetary Fund WP*, n°128.
- Egert, B. (2005) “Equilibrium Exchange Rates in South-eastern Europe, Russia, Ukraine and Turkey: Healthy or (Dutch) Diseased?”, *BOFIT DP*, n°3
- Estrin, S., G. Urga, S. Lazarova (2001), “Testing for Ongoing Convergence in Transition Economies, 1970 to 1998”, *Journal of Comparative Economics*, Vol. 29, pp. 677-691.
- EBRD (2004), *Transition report*.
- Evans, P., G. Karras (1996), “Convergence revisited”, *Journal of Monetary Economics*, n° 37, pp.249 – 265
- Fatas, A., I. Mihov (2003), “ The case for restricting fiscal policy discretion”, *Quarterly Journal of Economics*, Vol. 118 (4), pp. 1419-1448.
- Fidrmuc, J., Korhonen I. (2004), “A Meta-analysis of Business Cycle Correlation between the Euro area and CEECs: What do we know – and who cares?”, *BOFIT DP*, n°20
- Fidrmuc, J., Korhonen I. (2003), “The Euro goes East Implications of the 2000-2002 economic slowdown for synchronization of business cycles between the euro area and CEECs”, *BOFIT DP*, n°6
- Freytag, A (2004), “EMU Enlargement: Which concept of Convergence to Apply?”, *Friedrich-Schiller-Universitaet Jena, Economic Faculty D*, n°1.
- Gács, J. (2003), “Structural change and catching up: the experience of the ten candidate countries”, in Tumpel-Guerell, G., P. Mooslechner (eds.), *Economic Convergence and Divergence in Europe*, Osterreichische Nationalbank, Edward Elgar Publishing.
- Goodhart, Ch. (1998), “The Two Concepts of Money: Implications for the Analysis of Optimal Currency Area”, *European Journal of Political Economy*, Vol. 14, 407 - 432
- Hagen, J., I.Traistaru (2005), “Macroeconomic adjustment in The New EU Member States” in Detken, K., V. Gaspar, G. Noblet (eds), *The New EU Member states Convergence and Stability Third Report*, European Central Bank.
- Hallet, M. (2004), “Institutional quality and catching-up in Europe: Implications for EU structural policies”, EU Commission *Mimeo*
- Horvath, J. (2003), “Optimum Currency Area theory: A selective review”, *BOFIT DP*, n°15
- Horvath, J. and A. Rátfai (2003), “Supply and Demand Shocks in Countries to Join the European Monetary Union”, *Journal of Comparative Economics*, Vol. 32 (2), pp. 202-211
- Holscher, J (2002), “Over – or Undervalue Euroland Entry? Study carried out in collaboration with “Monetary and Exchange Rate Strategies Related to the Current European Union’s Enlargement Process” ACE – Project Nr. P98-1065 – R <http://www.tinbergen.nl/~phare>

- Kočenda, N. (2001), “Macroeconomic Convergence in Transition Countries”, *Journal of Comparative Economics*, Vol. 29 (1), pp. 1-23.
- Lafrance, R., P. St-Amant (1999), “Optimal Currency Areas: a Review of the Recent Literature”, *Bank of Canada WP*, n°16
- Mehrota, A., T. Peltonen (2005), “Socio-Economic Development and Fiscal Policy. Lessons from the Cohesion Countries for the New Member States, *European central bank WP*, n°467.
- Mongelli (2005), “What is the European Economic and Monetary Union Telling us about the Optimum currency area Properties?”, *Journal of Common Market Studies*
- Mullineux, A., V. Murinde (2003), “Financial Sector Convergence in Europe” in Tumpel-Guerell, G., P. Mooslechner (eds.), *Economic Convergence and Divergence in Europe*, Osterreichische Nationalbank, Edward Elgar Publishing.
- Nenovsky, N., P. Chobanov (2005), “Convergence of the Bulgarian Economy to the European Economy”, *Bulgaria 2010 : Report for The President of the Republic of Bulgaria*
- Nenovsky, N, K.Hristov (2002), “New Currency Boards and Discretion. The Empirical Evidence from Bulgaria, *Economic Systems*, 2002, Vol. 26. (1), pp.55-72
- Nenovsky, N.and D. Koleva (2001). Real Wages Rigidities and the Choice of Monetary Regime, Bulgarian National Bank, Discussions Papers, No 18.
- NOBE (2005). Forecasts of the economic growth in OECD countries and central and eastern European countries for the period 2000-2040, United Nations, ECE/TIM/DP/24
- Popa, C., S. Rosentuler, E. Iorga, W. Salater, D.R. Sasu, A. I. Codirlasu (2002), “Direct Inflation Targeting: A New Monetary Policy Strategy for Romania”, *National Bank of Romania OP*, n°1.
- Popa, C. (2005), “Preparations and Prerequisites for the Introduction of Inflation Targeting in Romania”, *NBR – BoE Conference on Inflation Targeting: International Experience and Romania’s Prospects*
- Pague K.H. (2003), “German Economic Reunification: a Special Case with General Lesson?” in Tumpel-Guerell, G., P. Mooslechner (eds.), *Economic Convergence and Divergence in Europe*, Osterreichische Nationalbank, Edward Elgar Publishing.
- Roland, G. (2005), “After Enlargement: Institutional Achievements and Prospects in the new Member States in Detken, K., V. Gaspar, G. Noblet (eds), *The New EU Member states Convergence and Stability Third Report*, European Central Bank.
- Roemisch, R. (2003), “Regional Disparities within Accession Countries”, in Tumpel-Guerell, G., P. Mooslechner (eds.), *Economic Convergence and Divergence in Europe*, Osterreichische Nationalbank, Edward Elgar Publishing.
- Sala-i-Martin, X. (2003), “Keynote speech: Convergence and Divergence – Theoretical Underpinnings” in Tumpel-Guerell, G., P. Mooslechner (eds.), *Economic Convergence and Divergence in Europe*, Osterreichische Nationalbank, Edward Elgar Publishing.

Suppel, R. (2003), “Comparing Economic Dynamics in the EU and CEE Accession Countries”, *European Central Bank WP*, n°267.

Varblane, U., P. Vahter (2005), “An Analysis of the Economic Convergence Process in the Transition Countries”, *Tartu University Press*, n°241.

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