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Euro area enlargement and euro adoption strategies

Zsolt Darvas and György Szapáry

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In May 2008, it will be ten years since the final decision to move to the third and final stage of Economic and Monetary Union (EMU), and the decision on which countries would be the first to introduce the euro. To mark this anniversary, the Commission is undertaking a strategic review of EMU. This paper constitutes part of the research that was either conducted or financed by the Commission as source material for the review.

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Euro Area Enlargement and Euro Adoption Strategies

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Abstract:

The paper discusses the risks and challenges faced by the new members on the road to the euro and the strategies for and timing of euro adoption. We investigate the real-nominal convergence nexus from the perspective of euro area entry. We argue that the initial level of economic development as measured by per capita income and the speed of real convergence have a bearing on the strategies to follow and on the timing of entry into euro area. This is because the lower is the per capita income, the larger is the price level gap to close and the greater is the danger of credit booms and overheating. We argue that inflation targeting with floating rates is better suited than hard pegs to manage the price level catching-up process. We suggest a modification in the Maastricht inflation criterion which as currently defined has lost its economic logic.

JEL classification: E31, E52, E60, F30

Key words: euro area enlargement, convergence, exchange rate, inflation, Maastricht

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1. Introduction

The twelve new member states (NMS) which have joined the EU since 2004 do not have an opt-out like Denmark and the United Kingdom and have to adopt the euro under the Treaty. The timing of euro adoption depends on satisfying the Maastricht requirements of nominal convergence. The benefits of a currency union, in general, and of the adoption of the euro by the EU member states, in particular, have been widely discussed in the literature.² Suffice here to recall the main ones. By eliminating exchange rate fluctuations and the associated uncertainty and transaction costs, a currency union promotes trade³ and financial integration⁴. Furthermore, it enhances price transparency and hence competition. For the NMS, membership in the euro area could also permit to import credibility to the extent that the credibility of the common monetary policy is regarded as greater than the monetary policy of the individual country. Finally, the drive toward euro adoption and the attendant desire to make real and nominal convergence sustainable may promote reforms, for instance in the areas of fiscal institutions and transparency, deregulation, incomes policy, etc. All these benefits can lead to higher growth and better living standards for the society as a whole.⁵

The aim of this paper is to explore and discuss the following issues: (i) given the characteristics and initial conditions of the NMS, what are the risks and challenges on the road to euro and after euro adoption; and (ii) what should be the strategy for and the timing of adoption of the euro.

The initial conditions of the NMS are reviewed from the perspective of euro adoption. For this purpose, the paper presents an overview of the relevant macroeconomic developments and structural indicators. It presents findings of model calculations investigating the real-nominal convergence nexus during the catching-up process of the NMS; reports the most recent data available on the Balassa-Samuelson effect; presents new calculations investigating whether the exchange rate has performed as a shock absorber or as a source of shocks in the Central and Eastern European countries (CEEs); and updates calculations with the most recent data available on business cycle synchronization and output volatility. These are particularly relevant issues when considering entry into the euro area. When discussing the risks and challenges, the paper looks at the lessons that may be drawn from the experience of those euro area members which have been facing challenges similar to the ones with which the new members have to cope. In doing so, the paper draws on the insightful analysis of the European Commission (European Commission, 2006).

We find that the standing of the NMS with respect to the traditional optimal currency area (OCA) properties has significantly improved over the years and is by now, on the whole, not worse, and in some cases is even better, than the standing of the current euro area members. We regard compliance with the OCA requirements not much of an issue anymore as regards the readiness for euro adoption.

² See, in particular, Eichengreen (1992), Emerson et al (1992) and De Grauwe (2002). Mongelli (2005) provides a comprehensive review of the optimal currency area literature. Csajbók and Csermey (2002) analyse the costs and benefits of the introduction of the euro in the case of Hungary.

³ Rose (2000) finds that currency unions increase trade substantially. Many other authors have also found a significant positive effect on trade, although to a less important extent than Rose. For a meta analysis of the findings of the empirical research on the topic see Rose and Stanely (2005).

⁴ See for instance De Grauwe and Mongelli (2005) and EU Economy 2006 Review.

⁵ Empirical investigation by De Grauwe and Schnabl (2005) and Schnabl (2007), for instance, document evidence in favour of a positive impact of exchange rate stability on growth in small open economies.

We find that the initial level of development of a country measured by its GDP per capita and the speed of real convergence are the main determinants of the price level convergence and hence of the relative inflation in the long-run, which also depends on the exchange rate regime applied. The countries with the lowest per capita income have the largest initial price level gap to close. The less developed CEEs have also the lowest initial level of credit to GDP ratio and hence the greatest potential for credit booms as credit converges toward its equilibrium level. The key issue then is whether, taking into account the initial level of development, the catching-up process of the price level can be better managed inside or outside the monetary union and, by implication, whether the transition to the euro can be better managed with a floating or with a fixed exchange rate regime.

What is the most appropriate monetary-cum-exchange rate regime to best manage the catching-up process is a complex issue. We argue in the paper that the main risks for the NMS with hard pegs is that with no room to let the nominal exchange rate appreciate to accommodate the price level convergence and with little or no risk premia, the real interest rates become excessively low due to higher inflation. This carries the danger of credit booms and can lead to large external account imbalances. Such developments have taken place in the Baltic countries recently.

For the inflation targeting countries with floating exchange rates, the possibility of letting the nominal exchange rate appreciate provides somewhat more flexibility to control inflation and accommodate price level convergence, but the room for manoeuvre should not be over estimated. This is because owing to the high degree of financial integration of the NMS and euro area entry expectation driven capital inflows, the effectiveness of domestic monetary policy is constrained.

Whether operating under fixed or floating regime, the important role of other policies to tame inflation, namely of fiscal, incomes and structural policies is clear. A key ingredient of success is productivity growth indispensable for the economic catching up to proceed smoothly in an environment of price stability.

An issue related to the real convergence process is whether the Maastricht criteria of inflation and exchange rate stability laid down 15 years ago for a group of countries with less divergent levels of economic development can be reconciled with the lesser degree of real convergence of most of the new members. Or to put it differently, whether these criteria are such that they unavoidably will keep out of the monetary union countries which will have already reached a stage where they could function normally in the euro area and reap the benefits of membership. We raise the question of modifying the Maastricht inflation criterion. We argue that the criterion as currently defined has lost its economic logic. We suggest an approach that has a more justifiable economic logic and would somewhat increase the acceptable rate of inflation for admission into euro area. The impact on the inflation of the euro area as a whole would be minimal.

We include among the new member states Cyprus, Malta and Slovenia which already joined the euro area. Therefore, in this paper – including the Tables and Graphs –we refer to the 12 old euro area members (EA12) when we talk about the euro area. Cyprus and Malta have functioned under market conditions for a long time, while the CEEs were under central planning for four decades and adopted the institutions and the mechanisms of private market economies gradually and at different speeds only since the early 1990s.

Their economies therefore exhibit features that do not necessarily apply to Cyprus and Malta.⁶

The rest of the paper is organized as follows. Section II reviews the initial conditions in the NMS from the perspective of euro adoption. Section III discusses the risks, challenges and the long term strategies on the road to euro and after entry into the euro area. In the light of these challenges, Section IV considers the strategies and timing for euro adoption. Section VI concludes.

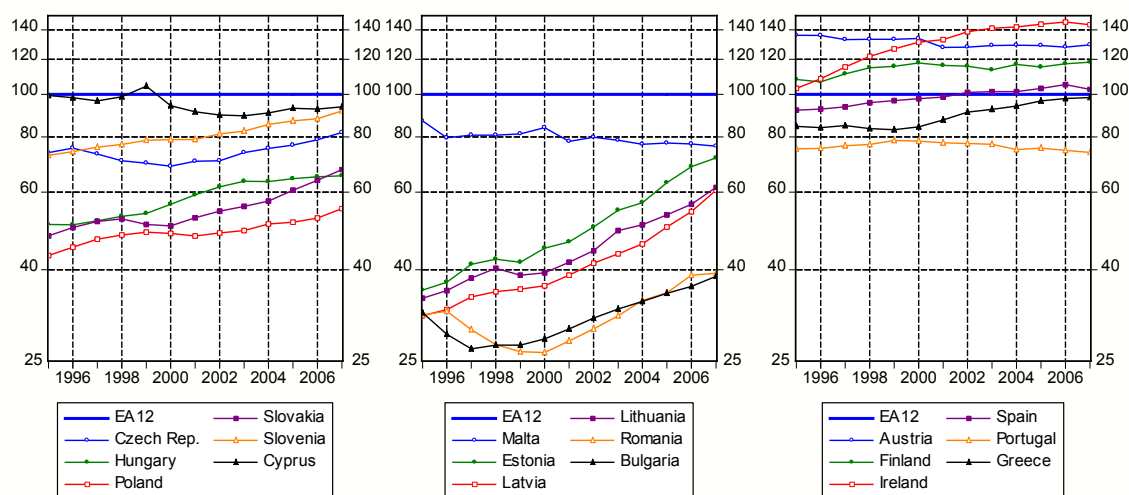
⁶ This paper does not examine the three old EU member countries which are outside of the euro area: Denmark, the UK and Sweden. Denmark shadows the ECB's monetary policy and is not a member of the euro area because euro adoption was turned down by a referendum at home. Sweden's membership was also rejected by its voters in a referendum. Since Sweden does not have an opt-out, it can remain outside of euro area by not entering ERMII. The UK Five Tests by HM Treasury provides an exhaustive list of the conditions under which it would be advantageous for the UK to adopt the euro and this paper could add little to that work.

2. Initial conditions from the perspective of euro adoption

2.1. The real-nominal convergence nexus: large differences among the new members

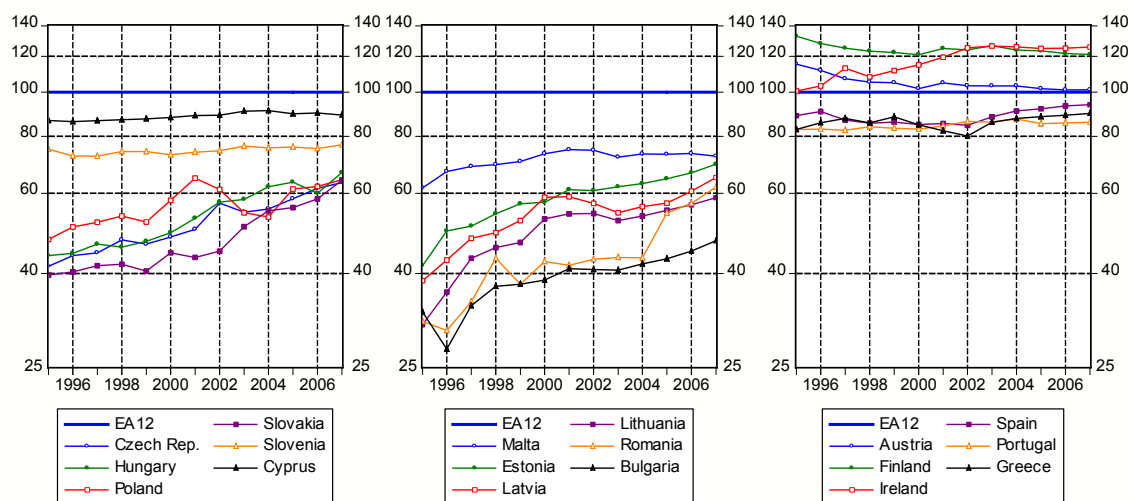
A salient feature of the economic developments of the new members is their catching up in terms of GDP per capita and the associated price level convergence (*Graphs 1 and 2*). A well established fact in economic theory is that richer countries tend to have higher price levels expressed in a same currency and therefore the overall inflation rate in the catching-up countries is higher and/or their nominal exchange rate appreciates as they close the gap. As will be discussed later, the key theoretical underpinning of price level convergence is the Balassa-Samuelson effect. The price level convergence is an equilibrium phenomenon, though transitory factors, such as for instance overheating, can also affect the actual speed of price level increases. Consequently, countries experiencing high growth rates, such as most of the NMS, are unlikely to achieve simultaneously a stable nominal exchange rate and a low level of inflation, at least until a certain level of price convergence has already been reached.

Graph 1, GDP per capita in purchasing power standards (EA12 = 100), 1995-2007



Source: Eurostat.

Graph 2, Price level of consumption (EA12 = 100), 1995-2007

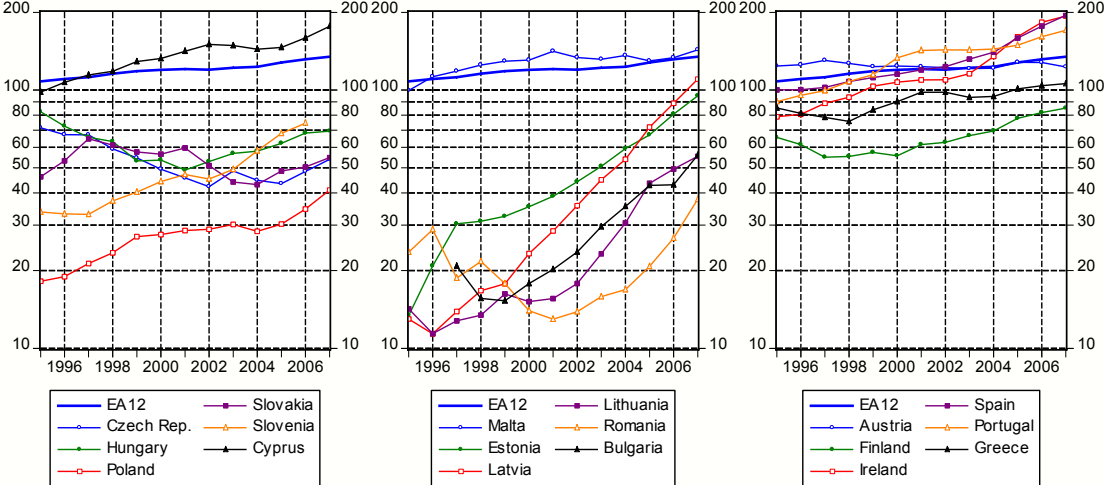


Sources: Eurostat for 1995-2006; 2007 values were calculated by us using domestic and EA12 inflation and euro exchange rate changes. Note: Values shown correspond to comparative price levels of final consumption by private households including indirect taxes (EA12 = 100)

With a view to providing a starting point to address these issues, *Table 1* presents a summary of key economic indicators of the NMS and selected euro area members. The Table ranks the new members according to their 1995 level of per capita GDP relative to the average level of the original EA12 countries. The ranking starts with Cyprus which had the highest relative per capita GDP in 1995 (99.3%) and ends with Latvia which had the lowest (31.5%). Since we focus on the challenges ahead, Table 1 presents annual averages of the main economic indicators only for the more recent period of 2004-2007.

The five countries with the lowest relative per capita GDP in 1995 are the three Baltic States, Bulgaria and Romania. Even in recent years, these countries recorded the fastest annual rates of growth of GDP, the fastest credit growth, the largest current account deficits, the most rapid wage increases and four of them had the highest inflation if we abstract from Hungary where inflation has been recently boosted by tax increases and administrative price adjustment to deal with a runaway fiscal deficit. Those five countries had also the lowest starting price level in the mid-1990s (except Estonia) and the lowest credit/GDP ratios (*Graph 3*). Four of those countries have been operating under fixed exchange rate arrangements, but Romania has had a floating rate.

Graph 3, Domestic credit (in percent of GDP), 1995-2007



Source: IMF, IFS. Note: Values for 2007 are projections by us using data of 2007Q3 for most of the countries and 2007Q2 for some of the countries.

If we look at the four countries with the highest relative per capita GDP in 1995, i.e., Cyprus, Malta, the Czech Republic and Slovenia, they recorded lower output growth, slower credit expansion, smaller current account deficits, and lower wage growth and inflation in recent years. Two of these countries, Cyprus and Malta, had fixed rates, the Czech Republic had a floating rate and Slovenia was under a tightly managed float, with practically a fixed rate in more recent years. The three countries in the middle of the rankings in terms of GDP per capita (Hungary, Slovakia and Poland) also recorded, compared to the five countries in the bottom of the rankings, slower output growth (except Slovakia), smaller credit expansion, lower current account deficits and lower inflation (except Hungary as noted). All three countries had floating rates.

Table 1, Summary of key economic indicators

	GDP per capita at PPS		Credit/GDP	Ex.Debt/GDP	Δ PROD	ΔGDP	ΔPriv.Cons.	ΔI	ΔX	ΔM	CA/GDP	Real interbank IR	Δ Credit	ΔER (euro)	Δ REER CPI	Δ REER ULC	Budget/GDP	Δ WAGE	ΔHICP	ER regime
	1995	2007	2007	2006	Average in 2004-2007															
Cyprus	99.3	93.6	176.5	81.5	-0.4	3.9	4.7	6.4	4.0	4.6	-5.6	2.0	11.8	0.1	0.0	0.4	-2.2	5.7	2.1	fixed
Malta	87.0	76.3	143.2	n.a.	1.7	2.4	2.5	10.8	2.2	3.4	-6.3	1.3	7.4	-0.2	1.1	-0.9	-3.1	-0.9	2.1	fixed
Czech Rep.	73.7	81.9	54.0	40.8	7.9	5.3	3.7	6.6	14.8	12.0	-3.3	0.1	11.6	3.5	3.0	2.9	-3.2	8.3	2.3	float
Slovenia	72.7	91.6	76.3	82.9	6.2	4.5	3.2	6.8	10.5	9.9	-2.8	0.9	23.8	-0.6	-0.2	0.5	-1.4	6.2	3.1	managed
Hungary	50.7	65.3	69.3	108.6	11.2	3.8	1.9	0.5	14.7	10.9	-6.6	2.7	13.4	0.3	3.2	3.6	-7.3	7.1	5.6	float
Slovakia	47.8	67.5	54.8	58.5	7.0	7.1	6.0	12.0	15.3	14.8	-6.1	0.0	17.1	5.3	6.8	6.8	-2.9	9.9	4.1	float
Poland	43.1	55.1	41.0	49.4	8.7	5.3	4.3	11.9	11.6	12.3	-3.3	2.6	17.5	4.0	3.4	3.7	-4.1	8.4	2.4	float
Estonia	36.0	71.7	95.1	101.2	7.6	9.7	11.5	14.6	14.3	14.8	-13.1	-1.4	35.6	0.0	2.0	4.2	2.6	15.4	4.6	fixed
Lithuania	34.5	61.5	55.4	63.7	9.3	7.4	12.0	7.7	11.1	15.3	-9.9	-0.1	42.7	0.0	0.1	4.5	-0.9	13.6	3.4	fixed
Bulgaria	32.0	38.7	56.0	84.1	9.4	6.3	6.8	18.9	10.1	13.7	-13.1	-2.7	32.2	-0.1	3.4	1.8	2.6	12.7	6.8	fixed
Romania	31.6	39.3	37.8	42.4	8.9	6.8	12.5	14.1	10.5	20.8	-10.3	2.3	47.2	3.3	9.1	13.9	-1.9	15.2	8.1	float
Latvia	31.5	60.6	110.1	118.2	4.0	10.2	13.2	16.0	10.9	15.4	-17.9	-2.4	52.9	-2.2	2.3	8.4	-0.2	20.3	7.5	fixed
EA12	100.0	100.0	134.5	171.6	3.7	2.2	1.7	4.0	6.5	6.6	0.2	0.7	4.0	0.0	0.6	1.0	-1.9	1.9	2.1	fixed
Austria	136.0	129.4	122.7	199.7	5.9	2.6	2.0	2.1	7.3	6.2	2.3	0.9	5.2	0.0	-0.1	0.7	-1.3	3.3	2.0	fixed
Finland	108.0	118.2	85.2	124.1	4.0	3.8	3.5	5.3	8.2	8.6	5.8	1.9	11.8	0.0	-1.0	1.2	3.4	3.7	1.0	fixed
Ireland	103.1	143.7	193.4	730.7	4.9	5.2	5.8	6.2	5.4	6.6	-3.2	0.4	23.0	0.0	1.4	4.6	1.6	3.7	2.5	fixed
Spain	92.0	102.5	194.6	146.6	2.7	3.6	3.9	6.1	4.4	8.1	-7.7	-0.3	18.8	0.0	1.3	2.3	1.1	3.0	3.2	fixed
Portugal	75.2	73.8	170.1	195.9	3.9	1.2	1.8	-0.6	5.3	4.1	-9.0	0.4	8.9	0.0	0.6	0.6	-4.1	0.1	2.5	fixed
Greece	84.5	98.3	105.9	122.9	-0.1	4.1	4.0	5.9	6.7	6.1	-10.1	-0.3	11.0	0.0	0.8	3.7	-4.5	2.7	3.2	fixed

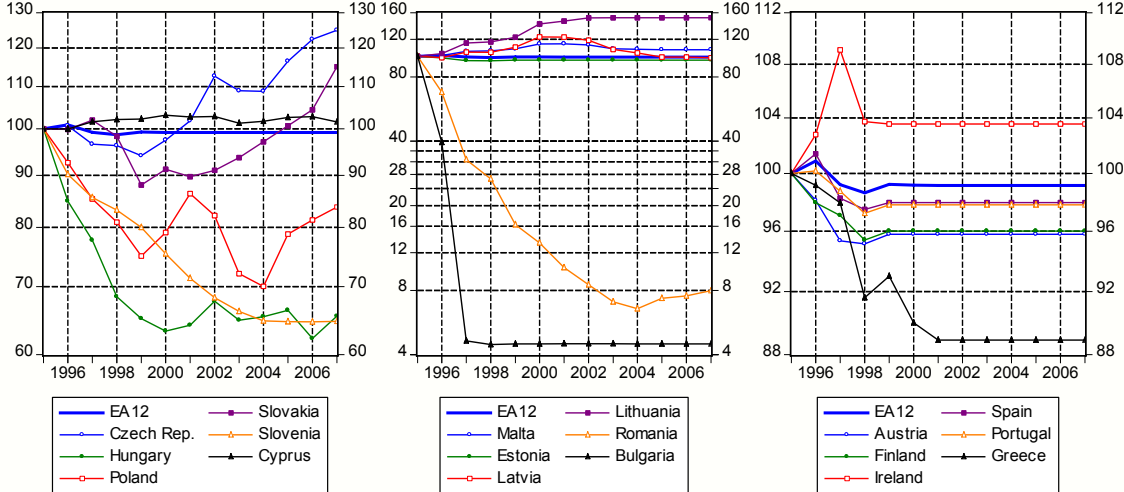
Sources: Detailed sources are listed below our other Tables and Graphs.

Note: Nominal growth rates for ΔCredit, ΔER, ΔWAGE and ΔHICP; rest of the growth rates are in real terms. 2006 value for Slovene domestic credit/GDP.

Looking at the evolution of nominal exchange rates since the mid-1990s of those six countries which had floating rates,⁷ we see a mixed picture (*Graph 4*). Romania's exchange rate depreciated sharply until 2004 and has been appreciating since then. Romania adopted inflation targeting in 2005. Slovenia's managed exchange rate depreciated until 2004 and remained stable thereafter until the country adopted the euro in January 2007. Hungary's exchange rate depreciated until it adopted inflation targeting in May 2001, following a period of crawling peg, and has fluctuated since then without exhibiting a significant trend up or down. In Poland, the exchange rate went through periods of both significant depreciations and appreciations, with the exchange rate appreciating since 2004. Poland adopted inflation targeting in 1998, following a period of crawling peg regime with a gradually widening band.

Only in the Czech Republic and Slovakia has the nominal exchange rate been on a fairly strong appreciating trend since the mid-1990s. The exchange rate of the Czech koruna started to float in 1997 and inflation targeting was introduced in 1998. In Slovakia, the exchange rate started to float in 1998 and the country entered ERMII in 2005. These two countries, which had the lowest price levels among the more developed CEEs in the mid-1990s, are also among the countries which have registered the lowest inflation in recent years.

Graph 4, Nominal exchange rate against the ECU/EUR (1995 = 100), 1995-2007

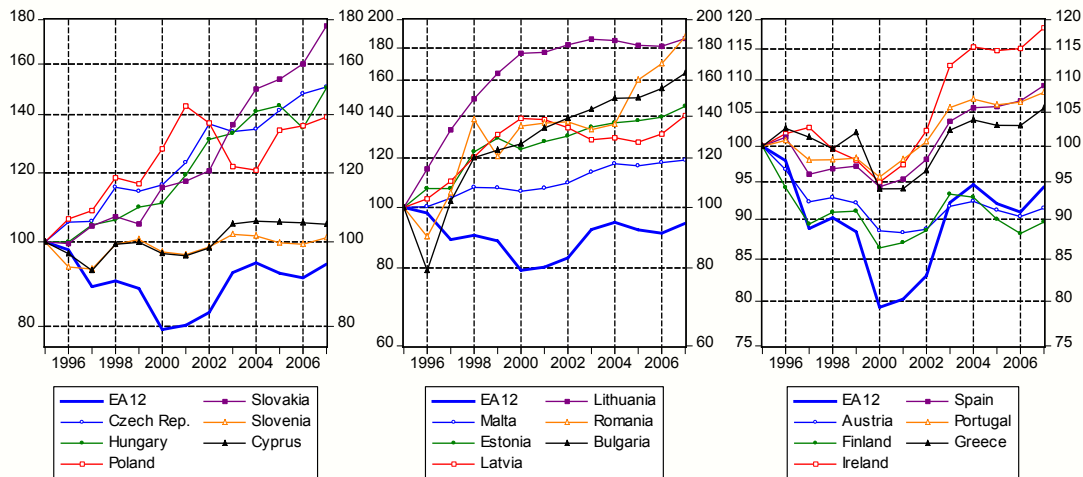


Source: Authors' calculation based on data from Eurostat. Note: a rise in the index means nominal appreciation.

The CPI based real effective exchange rate (*Graph 5*) is another representation of the price level convergence and provides a broadly similar picture as the comparative price levels shown in *Graph 2*. The economy wide unit labour cost (ULC) based real effective exchange rates exhibit similar trends to the CPI based real exchange rate. The three more developed countries have registered much less appreciations between 1995 and 2007 than the less developed ones, with the ULC based real exchange rate of Slovenia actually stagnating (*Graph 6*). The largest appreciations took place in Romania (180%) and Lithuania (140%). On the other hand, the appreciation was only 20% in Bulgaria. In the rest of the less developed CEEs the appreciations ranged between 60% and 90%.

⁷ The NMS have maintained different exchange systems over time and have also changed regimes on occasion. The regimes practiced included currency boards, fixed pegs to a basket, crawling pegs, managed float and free float. Currently, four countries are members of ERMII: Estonia and Lithuania with a fixed rate as a unilateral commitment, Latvia with +/-1% fluctuation band as a unilateral commitment and Slovakia with the standard fluctuation band of +/-15%. Bulgaria has a currency board arrangement with the euro being the anchor currency. The Czech Republic, Poland, and Romania are under inflation targeting regimes with free floating exchange rates, while Hungary's inflation targeting is conducted in conjunction with an exchange rate band of +/-15% against the euro. Before joining the euro area, the exchange rate of Cyprus fluctuated within relatively narrow margins, Malta had a fixed rate and Slovenia used to practice a more or less managed float.

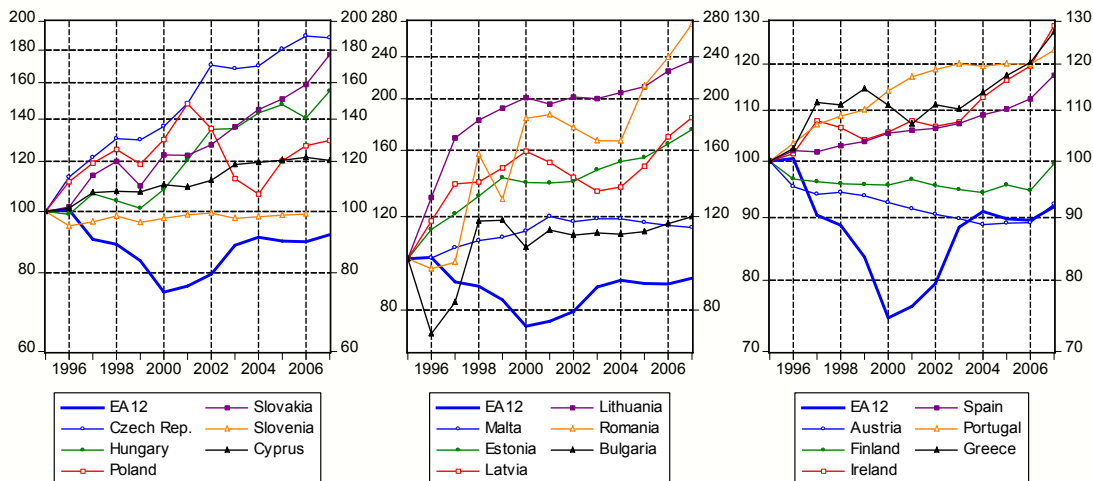
Graph 5, CPI based real effective exchange rate (1995 = 100), 1995-2007



Sources: Eurostat for all countries up to 2006 (calculated against 41 trading partners). 2007 values are from three different sources. (1) For old EU members, Eurostat data is available till 2007Q3. (2) For four CEEs, (Estonia, Latvia, Lithuania and Slovenia) our calculations against the 24 largest trading partners using exchange rate and CPI data from IMF (till September 2007). (3) For the remaining eight new EU members, REERs were calculated by the IMF against all countries of the world (available till August 2007).

Note: A rise in the index means real appreciation.

Graph 6, Total economy unit labour cost based real effective exchange rates (1995 = 100), 1995-2007



Source: Eurostat. Note: A rise in the index means real appreciation. Values for 2007 are projected using data up 2007Q3.

Another feature emerging from the data is that the faster growth in the less developed countries has been accompanied by a much more rapid increase in private consumption than in the more developed countries. Consumption in these countries has been fuelled by the rapid increase in wages and, as will be discussed later, by the substantial increase in the credit to households. Investment has also expanded fast, a significant portion of which has been in housing construction (see later). On the other hand, regarding export growth, there has not been much difference between less and more developed countries: it has been equally fast in all CEEs during the period under review. Importantly, there is no clear pattern in the rate of growth of productivity in manufacturing, the less developed and faster growing countries did not post higher productivity gains in the period considered.

This bird's eye view of the main economic indicators allows us to make a number of observations.

First, the low starting level of per capita GDP and the associated low level of prices, as well as the low initial level of credit are important factors explaining the rapid growth of credit and the high rate of inflation in the countries at the bottom of the rankings. This applies both to the Baltic countries and Bulgaria with fixed exchange rates and to Romania with floating rate.

To test this hypothesis, we estimated some panel models for the period of 1998-2006 to uncover the determinants of price level convergence in the NMS (for details, see Annex). We found – in line with the literature – that per capita income is indeed the key explanatory variable of the price level. Domestic demand in excess of GDP is also a significant explanatory factor. To the extent that credit expansion influences domestic demand, and further that the credit expansion is influenced by the initial level of credit, the latter is an important factor determining the price level. This is shown in the model by the result that if we leave out per capita income which is highly correlated with credit per GDP, the credit per GDP ratio becomes a highly significant explanatory variable of the price level.

Higher real (and nominal) interest rate compared to the euro area interest rate, which influences the inflow of interest rate sensitive capital, is also a factor having significant positive effects on the price level, since it can appreciate the nominal exchange rate leading to a rise in the price level relative to the euro area (if the exchange rate pass-through is less than perfect). We also find that the fixity of the nominal exchange rate is an additional explanatory factor of the price level, but that its significance declines over time, in parallel with the convergence of per capita income. This confirms the principle that under fixed exchange rate, the price level convergence takes place via higher inflation and as the real convergence proceeds, this influence diminishes. However, if the peg contributes to excess domestic demand growth, for instance via lower real interest, then of course the peg itself has an (indirect) effect on price level increases and inflation, since the parameter of domestic demand is found to be significantly positive.

What these findings show is that the level of per capita income, the speed of income convergence, domestic demand growth in excess of GDP growth, as well as the regime of the exchange rate all have a significant explanatory power in the determination of price level convergence. The faster is the real convergence, the faster is the price level convergence. Under fixed exchange rate conditions, the price level convergence translates into higher domestic inflation. Under floating exchange rates, the price level convergence can be accommodated either by higher inflation or by an appreciation of the nominal exchange rate, or by a combination of the two. The results of the model calculations also show that the interest rate sensitive capital inflows can temporarily appreciate the nominal exchange rate in excess of what would be required by price level convergence implied solely by the catching-up of GDP per capita.

A second observation is that the significant appreciation of the real effective exchange rates observed in all but the more developed CEEs occurred irrespective of the exchange rate regime, whether we look at the regimes in place across countries, or whether we take the different regimes in the same country when it has changed over time. This shows that the real appreciation inherent in the catching-up process is not dependent on the exchange rate regime, although the regime can determine the risks of overshooting of the real exchange rate as it will be discussed later.

A third observation is that in the Czech Republic, Slovakia and, more recently, in Poland and Romania, the real exchange rate appreciation has been accompanied by a significant appreciation of the nominal exchange rate. The first three countries are also among

those which have had the lowest average inflation rate in the more recent period of 2004-2007, and Romania has seen its inflation rate decline rapidly. In other words, the price level convergence has been accompanied by a lower inflation rate when the nominal exchange rate was let to appreciate, a finding which is confirmed by the above mentioned model calculations.

Fourth, the faster rate of growth in the less developed countries except Bulgaria has been largely driven by consumption rather than productivity gains which, together with investment growth and despite rapid increase in exports, has led to large current account deficits. This means that the catching up of these countries has been largely at the cost of accumulating foreign debt. Fiscal looseness has not been the source of the large current account deficits of these countries. These countries have recorded surpluses or deficits of less than one per cent of GDP per year on average during 2004-2007. Only Romania had an average deficit of 2% per year in that period.

Finally, the Baltic countries and especially Estonia are fast catching up to the countries in midfield in terms of per capita GDP, but Bulgaria and Romania, which started the catching-up process only in around 2000, are still farther behind. This suggests that the price level convergence due to the catching up-process should moderate in the Baltics, but that it will be still a significant source of future inflationary pressure in Bulgaria and Romania.

These observations indicate that the starting level and the speed of real convergence, as well as the exchange rate regime have a bearing on the challenges facing the new members in meeting the *nominal* convergence criteria for euro adoption and, as a consequence, on the choice of strategies to adopt on the road to the euro and on the timing of euro adoption. These issues will be explored further in later sections.

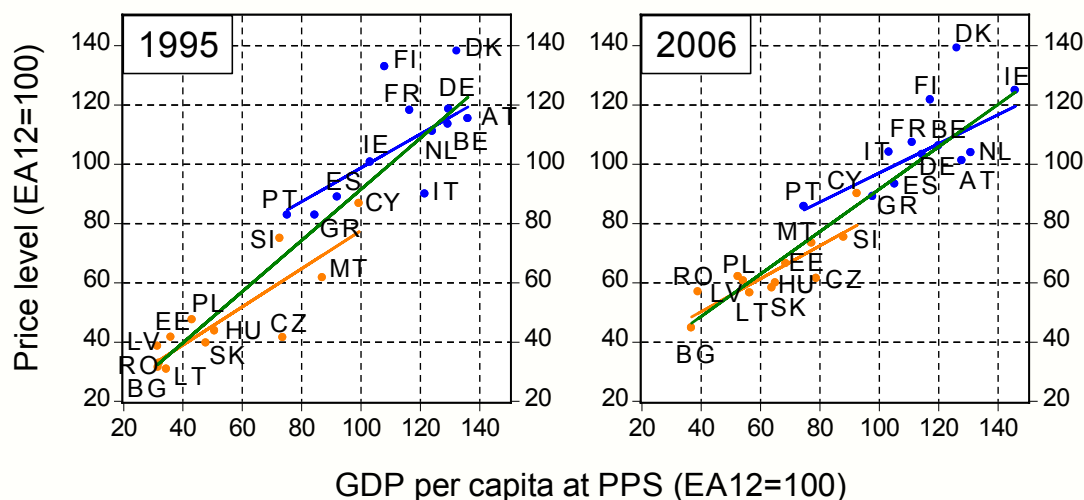
2.2. The Balassa-Samuelson effect: diminishing but only one element of price level convergence

With the expected entry of new member states into the euro area, numerous studies have examined the importance of the Balassa-Samuelson (BS) effect in the NMS. The motivation behind the interest is that, as mentioned, during the catching-up process, the lower price levels in the NMS will converge over time to the higher price levels of the more developed euro member states (*Graph 7*) implying, *ceteris paribus*, a higher inflation if a nominal appreciation of the exchange rate is no more an option. If the higher inflation is due to the BS effect, i.e., to the faster productivity growth in the NMS⁸, then the implied real appreciation of the exchange rate is competitiveness neutral, an important consideration once a country has adopted the euro⁹.

⁸ Using a structural VAR framework, Lein-Rupprecht, León-Ledesma and Nerlich (2007) confirm that productivity growth had a positive effect on price levels in the NMS.

⁹ The Balassa-Samuelson effect works as follows: in the tradable sector where the law of one price holds, productivity grows faster than in the non tradable sector, which is typically more labour intensive and in which the growth of productivity is generally smaller and the international competition is weaker. In the tradable sector, wages tend to be linked to productivity growth, pulling up the wages in the non tradable sector. Through the diffusion of technology, productivity in a catching-up economy grows faster than in a more advanced country. Thus, in the catching-up countries, prices in the non tradable sector, such as services, increase faster than in the advanced countries and hence the overall inflation is higher in the former countries.

Graph 7, Convergence of output and price level, 1995 and 2006



Sources: Eurostat and IMF; regression lines are authors' estimates. Note: *horizontal axis*: GDP per capita in purchasing power standards (EA12 = 100). *Vertical axis*: comparative price levels of final consumption by private households including indirect taxes (EA12 = 100). Three regression lines are shown: (1) for a cross section of NMS (the short line on the left), (2) for a cross section of old euro area members plus Denmark less Luxembourg (the short line on the right), and (3) for a cross section of both country groups (the long line). See details of the regressions in the Annex.

Égert, Halpern and MacDonald (2006) review the findings of the literature on the estimated size of the BS effect in the NMS. Earlier works have found a sizeable BS effect, but more recent research points to lower effect. The most recent update of the size of the BS effect in the new and old members which we are aware of is that of Égert (2007), covering the period of 1995-2005. We report his estimates in *Table 2*. The general picture that emerges from this Table is that the BS effect, i.e., the incremental inflation due to productivity growth differentials, ranges between 0.4 and 2.4 percentage points in the new members and is naturally somewhat higher than in the old members. Relative to the euro area where BS forces are also at work, the BS effect in the NMS range between zero or a negative value and 1.2%. With regard to the CEEs, there is no clear pattern between the size of the BS effect and the level of economic development, which is in line with the observation made earlier that no such pattern can be found between the gains in productivity and the level of economic development in the new members. In Cyprus, however, the most developed new member, the BS effect is the smallest.

While the BS effect undoubtedly does explain part of the price level convergence between countries of different levels of development, its conventional measurement has a number of weaknesses. First, it assumes that tradable prices expressed in a common currency equalize between countries, a hypothesis which is not uniformly true and is disputed in the literature. Second, it assumes that there is a proportionate link between productivity and real wages in the tradable sector and that wages in the non tradable sector equalize with wages in the tradable sector, two assumptions that often do not fully materialize.

There are a number of other factors as well to be considered when assessing the likely influence of the BS effect on price convergence in the years ahead (Égert, 2007). As noted earlier, the share of services is lower in the NMS than in the old members, but it is growing faster, which will increase their weight in the HICP and, *ceteris paribus*, the BS effect. On the other hand, productivity in the NMS has been growing fast in the services sector as well (e.g., distribution, financial services), which moderates the price increases in that sector.

Furthermore, the growth of productivity is likely to slow down from the rapid pace it is recording during the early years of catching up, which will mute the BS effect.

Table 2, The Balassa-Samuelson (BS) effect, 1995-2005

	BS effect		BS effect relative to euro area	
	Wide	Narrow	Wide	Narrow
Bulgaria	n.a.	n.a.	n.a.	n.a.
Cyprus	0.4	0.3	-0.6	-0.4
Czech Republic	1.0	0.7	0.0	0.0
Estonia	2.3	1.3	1.3	0.6
Hungary	2.1	1.6	1.1	0.9
Latvia	1.6	1.1	0.6	0.4
Lithuania	2.4	1.7	1.4	1.0
Malta	n.a.	n.a.	n.a.	n.a.
Poland	2.4	1.7	1.4	1.0
Romania	0.8	0.4	-0.2	-0.3
Slovakia	2.1	1.5	1.1	0.8
Slovenia	2.2	1.6	1.2	0.9
Austria	1.8	1.6	0.8	0.9
Belgium	0.7	0.6	-0.3	-0.1
Finland	2.6	1.5	1.6	0.8
France	0.9	0.6	-0.1	-0.1
Germany	1.4	0.8	0.4	0.1
Greece	0.7	0.5	-0.3	-0.2
Ireland	n.a.	n.a.	n.a.	n.a.
Italy	0.1	0.1	-0.9	-0.6
Luxembourg	n.a.	n.a.	n.a.	n.a.
Netherlands	0.1	0.1	-0.9	-0.6
Portugal	0.6	0.5	-0.4	-0.2
Spain	0.6	0.5	-0.4	-0.2
EA12	1.0	0.7	0.0	0.0

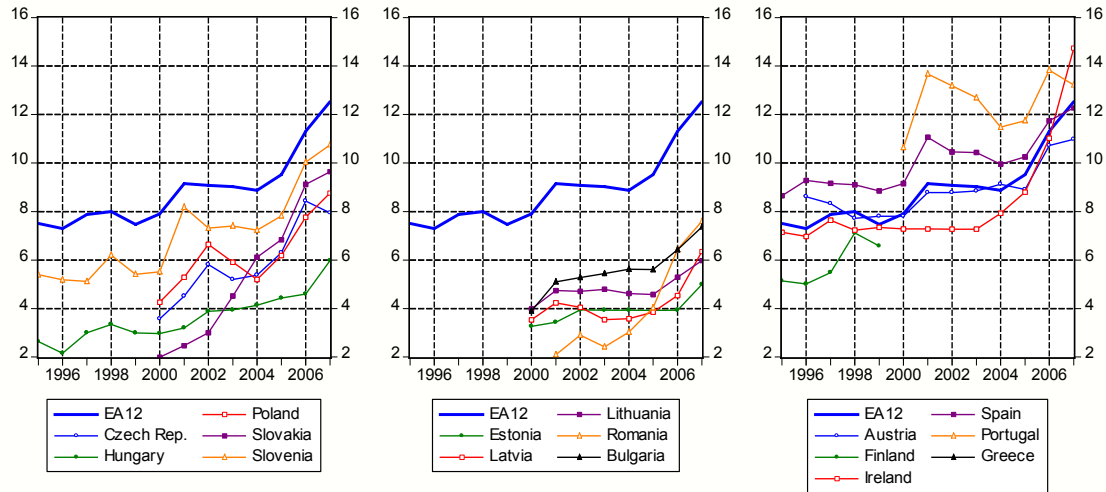
Source: Égert (2007), Table 2 (p. 9).

Note: Entries show the effect of productivity differentials on the domestic inflation rate. Wide: the non-tradable sector is represented by total services; Narrow: the non-tradable sector is represented by market services only.

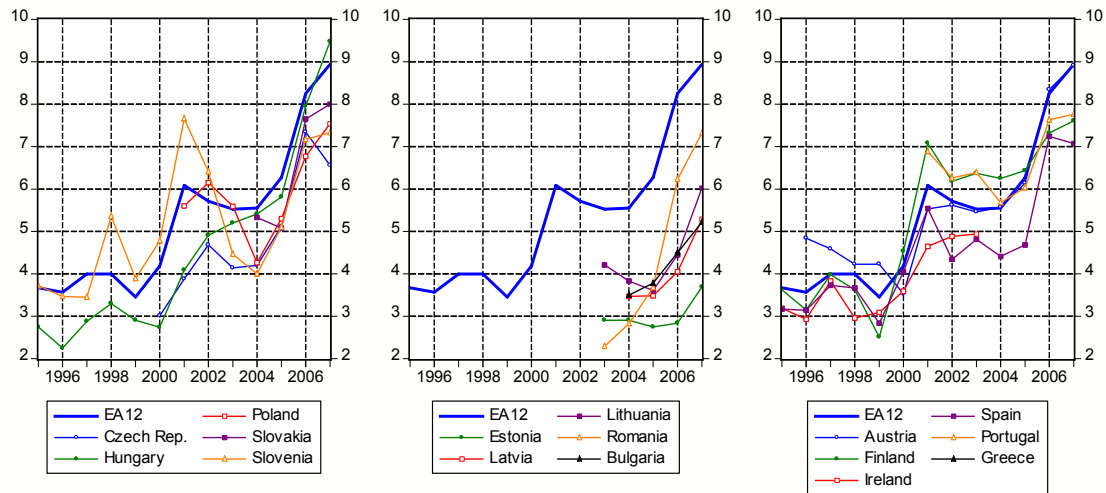
However, there are other structural factors not related to the BS phenomenon that will increase prices in the new members and influence the pace of price level convergence. A shift in consumption toward higher quality, higher priced goods that goes with the rise in incomes is one such factor. Regulated prices, such as electricity and gas prices are, particularly for households, still lower in the new than in the old members, despite rapid convergence toward euro area levels in recent years (*Graph 8*). While the cost recovery prices for utilities may be lower in the NMS due to the lower level of prices and wages, a relative increase in utility prices is likely in those countries in which these prices do not cover costs and are subsidized. The rates of inflation in the new members will therefore be influenced by the speed at which these prices will be further adjusted. The inflation rates are also likely to be affected in the years ahead by reforms in the health care and education systems, which will bring increases in the services provided in some of the new members. Reductions in the subsidies for public transportation are another source of probable inflation in some of the NMS. All in all, while the BS effect itself is likely to diminish, other structural factors will continue to influence the speed of price level convergence.

Graph 8, Gas and electricity prices, 1995-2007

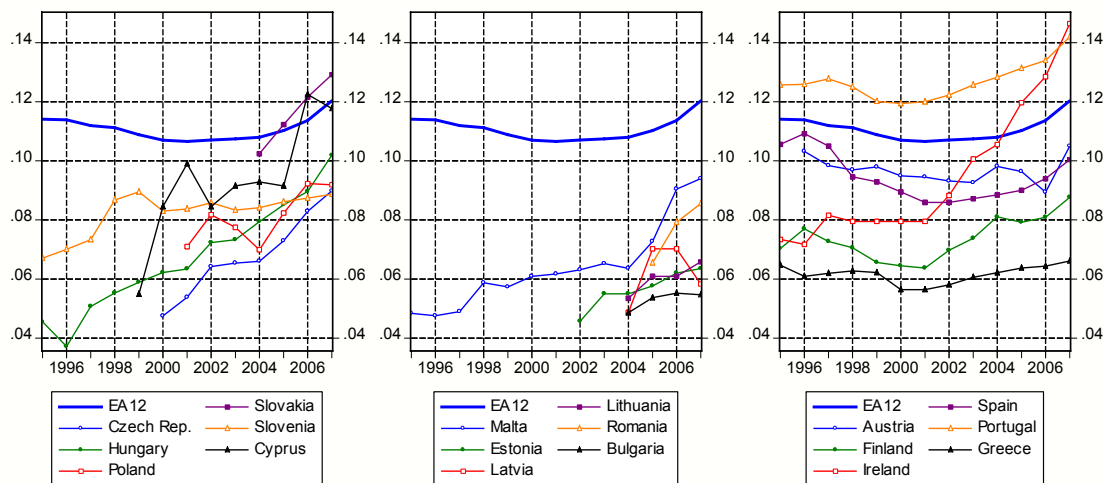
A. Household gas prices (euro per gigajoule)



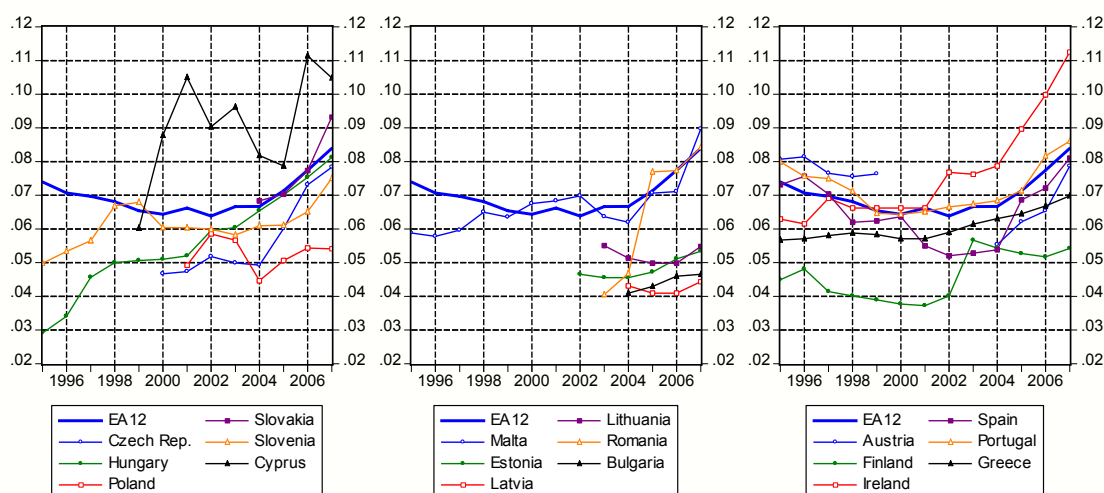
B. Gas prices for industrial users (euro per gigajoule)



C. Household electricity prices (euro per kWh)



D. Electricity prices for industrial users (euro per kWh)



Source: Eurostat. Note: prices shown are applicable on the 1st of January each year.

As noted earlier, there has been a considerable appreciation of the CPI based real effective exchange rates in most of the new members. The cumulative real appreciation is substantially larger than the estimated BS effect. One explanation of this is that in catching-up economies, the real exchange rate appreciates not only because of BS factors, but also because of an appreciation of the real exchange rate in the tradable sector driven by improving non-price competitiveness, reflecting a shift towards the supply of higher quality and higher value-added goods with less price elasticity in the export sector (Égert, Lommatzsch and Lahrière-Révil, 2006, IMF, 2006). The CPI based real effective exchange rate is only a proxy of competitiveness that does not capture such factors as technological upgrading and quality improvements. These factors have been particularly important in the CEEs, where there has been a substantial restructuring of manufacturing and exports toward the higher quality and greater value-added products directed to the EU and other mature markets.

A further source of the difference might be an undervaluation of the exchange rates in the former socialist countries at the start of the transition (Halpern and Wyplosz, 1997) and/or an overvaluation in the most recent period. Estimating equilibrium exchange rates is a notoriously complex undertaking. Five different approaches have generally been used in the literature. For an overview of the methods, see MacDonald (2000) and for their application to the CEEs, see Égert, Halpern and MacDonald (2006). Égert and Halpern (2006) have done a meta analysis of 32 studies estimating equilibrium exchange rates in eight CEEs which joined the EU in 2004. Some studies do report large initial undervaluations, but about two thirds of the reported misalignments for the more recent period of 2001-2002 are overvaluations, ranging between 2% and 19%. However, there are large differences according to the estimation techniques used and it would be misleading to conclude that most CEE's currencies are currently overvalued.

2.3. Exchange rate: a source of shock?

An issue debated in the literature is whether the exchange rate functions mostly as a shock absorber or as a source of shocks. This is a most relevant question from the perspective of adopting the euro, because if the exchange rate is more of a source of shock than a shock absorber for small open economies like the new members, then giving up exchange rate independence is more of a benefit than a cost in the long run.

Buiter (2000) argues that under a high degree of financial integration, market determined exchange rates are primarily a source of shocks and instability. Research done by Canzoneri, Viñals and Valles (1996) and De Grauwe and Schnabl (2005) suggest that stabilizing the exchange rate promotes macroeconomic stability. Clarida and Gali (1994) proposed a conceptual framework and an empirical approach based on a structural vector auto regression (SVAR) to investigate the importance of nominal shocks to explain variations in the exchange rates. Using long-run restrictions, Clarida and Gali (1994) identified supply, demand and nominal shocks in a three-variable system (output, prices, real exchange rate) and studied the sources of variation of the real exchange rate of major economies. In a subsequent paper, Artis and Ehrmann (2000) identified the shocks using mostly short-run identifying restrictions and reached a different conclusion than Clarida and Gali (1994). The subsequent econometric literature criticized the use of both long-run and short-run identifying restrictions, because the former is heavily burdened with estimation uncertainty, while the latter is generally ad hoc and not consistent with a large class of general equilibrium models (see, for instance, the surveys in Farrant and Peersman, 2006, and Darvas, 2008a). Faust (1998) and Uhlig (2005) proposed an identification strategy based on the signs of impulse response functions. Farrant and Peersman (2006) were the first to apply this identification strategy for the study of the role of exchange rate in major economies.

The sign restrictions adopted by Farrant and Peersman (2006), which corresponds to the theoretical model of Clarida and Gali (1994), are the following: (i) a supply shock increases output and decreases prices, while its effect on the real exchange rate is uncertain in the short run when there is sluggish price adjustment, hence it is not constrained; (ii) a demand shock increases both output and prices and appreciates the real exchange rate; (iii) a nominal shock also boosts output and prices, but depreciates the real exchange rate.¹⁰ These sign restrictions are imposed up to four quarters after the shock (including the contemporaneous effects). When supply or demand shocks dominate the variation of the real exchange rate (which is measured by a standard variance decomposition technique) then the exchange rate can be regarded as a useful shock absorber. However, when nominal shocks have a high role in explaining the variance of the real exchange rate, then the exchange rate functions rather as a source of shocks. Such nominal shocks could be a reversal of capital flows or a loosening of monetary conditions.

Following the methodology of Farrant and Peersman (2006), we have adopted sign restrictions to identify shocks in the NMS, using the sample period of 1999-2007. There have not been major changes in exchange rate systems of the NMS in this period, except in Hungary.¹¹ Furthermore, this period is after the crisis episode of 1997-1998, when these countries were hit by contagion, irrespective of their macroeconomic situation (Darvas and Szapáry, 2000).¹² We have examined the role of the exchange rate only for countries having a substantial degree of exchange rate flexibility (Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia). In fixed exchange rate regimes, the real effective exchange rate reflects price adjustments and variations in the non-euro exchange rates against the euro to the extent that the country under study trades with non-euro area countries, and this has little to

¹⁰ To be more precise, all restrictions also allow for zero effects as well, e.g. a supply shock does not decrease output and does not increase prices, etc.

¹¹ In 2001, the +/- 2.25% wide band was widened to +/- 15% and an inflation targeting regime was introduced to replace the previous crawling peg regime.

¹² Borghijs and Kuijs (2004) and López and Chacón (2006) studied the role of the exchange rate in some of the NMS using long-run restrictions over the sample periods of 1993-2003 and 1993-2004, respectively. These periods include many important policy shifts, most notably, changes from fixed or relatively rigid exchange rate systems to a floating or a wide band regime, which questions the applicability of the model, though Borghijs and Kuijs (2004) tried to tackle this problem by introducing regime dummies.

do with domestic shocks and the possible stabilizing or amplifying role of the exchange rate of the new members under fixed exchange rate regime. Our key results are summarised in *Table 3*.¹³

Table 3, Variance decompositions of real and nominal effective exchange rates

Panel A: Variance decompositions of real effective exchange rates

<i>Quarter(s) after the shock</i>	Supply			Demand			Nominal		
	0	4	20	0	4	20	0	4	20
Czech Republic	6.8	11.1	11.2	40.8	38.0	37.9	52.4	50.9	50.8
Hungary	10.8	15.2	15.3	34.2	37.8	37.6	55.1	47.0	47.0
Poland	17.3	17.9	18.0	35.4	34.3	34.2	47.3	47.8	47.8
Romania	17.1	16.9	16.9	40.0	38.1	38.1	42.9	45.0	45.0
Slovakia	12.9	16.5	20.0	59.2	42.3	38.2	27.9	41.1	41.8
Slovenia	11.2	16.4	17.4	44.4	41.6	41.3	44.4	42.0	41.3

Panel B: Variance decompositions of nominal effective exchange rates

<i>Quarter(s) after the shock</i>	Supply			Demand			Nominal		
	0	4	20	0	4	20	0	4	20
Czech Republic	5.5	10.0	10.6	48.6	47.6	47.2	45.9	42.5	42.2
Hungary	11.7	15.7	15.7	24.2	25.1	25.1	64.2	59.2	59.2
Poland	3.6	26.1	31.2	30.8	32.6	28.6	65.6	41.3	40.2
Romania	25.0	22.5	22.8	22.4	23.2	18.6	52.6	54.2	58.6
Slovakia	6.2	6.6	6.6	57.2	56.0	56.0	36.6	37.4	37.4
Slovenia	3.1	11.6	12.1	54.1	43.0	42.4	42.8	45.3	45.5

Source: Authors' calculations.

Note: The table reports results of variance decompositions calculated from a structural VAR model estimated on the quarterly logarithmic differences of GDP, consumer price and real (Panel A) or nominal (Panel B) effective exchange rate over the 1999-2006 period. Structural shocks were identified by sign restrictions as described in the main text. Values shown are the mean of variance decompositions of all admissible draws.

As can be read from this Table, a substantial part of real effective exchange rate variations in the Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia was due to nominal shocks. In the very short run, nominal shocks explain between 44 and 55 percent of real exchange rate variations in five NMS, but only 28 percent in Slovakia. At the five-year horizon, the role of nominal shocks is between 41 percent and 51 percent for all six NMS studied. These shares are rather large in light of the literature and suggest that the exchange rates in these countries are more a propagator of nominal shocks than a helpful absorber of real shocks. Using the method of long-run restrictions, Borghijs and Kuijs (2004) also find shares of nominal shocks in the neighbourhood of 50 percent for five CEEs and argue that such large shares indicate that the exchange rates have been a source of shock rather than a shock absorber.¹⁴ These findings should be taken into account when assessing how useful it can be as a policy tool the independence of exchange rate policy for the small open economies of the NMS already very closely integrated with the euro area.

¹³ For full details, including error bands for variance decompositions and robustness analysis, see Darvas and Szapáry (2008b).

¹⁴ Using the method of sign restrictions favoured by us, Farrant and Peersman (2006) found that the share of nominal shocks is between 50 and 62 percent (short run) and 31 and 57 percent (at 5-year) for the exchange rates of the UK, the euro area and Japan against the US dollar. They also argue that shares of these magnitudes indicate that the exchange rates have been more a source of shocks than a shock absorber.

2.4. Monetary transmission: limits on the effectiveness of domestic monetary policy

The relevance of the monetary transmission mechanism from the perspective of euro adoption is that if the effects of domestic monetary policy on inflation and output are large and very different in the new members from the effects observed in the euro area, then the cost of losing monetary policy independence might be significant. In the opposite case, the loss is less important.

There are characteristics of the CEEs that limit the effectiveness of monetary policy in general, and factors that limit the effectiveness of domestic monetary policy in particular.

Two characteristics limit the effectiveness of monetary policy in general. First, the ratio of credit to GDP is still low in these countries, ranging between around 41% for Poland and less than 76% for the other CEEs except in Latvia (110%) and Estonia (95%), compared with an average of about 135% in the euro area (*Graph 3*). In the latter two Baltic countries, the credit to GDP has increased very sharply in recent years. The reason for the low credit to GDP ratio in the CEEs is that under the socialist system, the firms' investment needs were largely covered via government budget transfers or from own resources, while household borrowing was constrained by the low level of incomes, the limited availability of durable goods and the restrictions on buying real estate. A second characteristic that limits the effectiveness of monetary policy in general is the low stock market capitalization and small holdings of financial assets by households, which weaken the channels through balance sheets and wealth effects.

More relevant from the perspective of euro adoption and the surrender of monetary policy independence are the factors that already constrain the effectiveness of *domestic* monetary policy. The main such factor is the large and growing share of foreign currency loans (*Table 4*), which weakens the effectiveness of domestic interest rate policy even in those countries which have not yet surrendered their monetary policy independence by adopting a pegged exchange rate. Among the countries with floating exchange rates, the share of foreign currency loans reached 45% of total loans in Hungary and 48% in Romania in 2006, due to the high positive spreads between the domestic and the relevant foreign interest rates. In Hungary, 80% of the new loans to households are granted in foreign currencies. The share of foreign currency loans in Poland (27%) and Slovakia (20%) is smaller, but still significant. In the Czech Republic, on the other hand, where the interest rate spreads are negative, the share is only 10%. In Malta, the share is about 9%.

The shares are highest in the Baltic States, ranging between 52% in Lithuania and 77% in both Estonia and Latvia. In the latter country the interest rate spreads have widened recently and 100% of the recent growth of loans has been in euros. In Bulgaria, at 44%, the share is also high. Since these countries have pegged exchange rates, the high share of foreign currency loans does not any more add significantly to the loss of monetary policy independence, but does represent a substantial risk if the exchange rate depreciated for some reason. In most CEEs, the foreign currencies used are euros, but in the Visegrád countries and in particular in Hungary, Swiss francs are popular.

Table 4, Share of foreign currency loans (in percent of total loans), 2004-2006

	Households		Non-financial corporations		Total	
	2004	2006	2004	2006	2004	2006
Bulgaria	12	17	n.a.	n.a.	47	46
Czech Republic	0.3	0.2	18.7	18.6	11.2	10.2
Estonia	64.9	77.8	78.7	75.6	72.1	76.7
Cyprus	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Latvia	65.1	77.1	56.3	77.0	59.8	77.0
Lithuania	42.8	43.9	64.8	58.2	58.0	52.3
Hungary	12.9	42.7	43.4	45.7	31.9	44.5
Malta	1.0	1.4	6.7	16.1	4.3	9.4
Poland	27.2	30.9	23.7	22.1	25.4	27.1
Romania	47	40	n.a.	n.a.	61	48
Slovenia	3	43	n.a.	n.a.	32	57
Slovakia	0.6	1.7	33.5	33.5	21.5	20.1

Sources: ECB, World Bank (2007).

Note: Calculated on the basis of outstanding amounts at the end of the period.

Another factor circumventing the domestic monetary policy is the borrowing by firms from their mother companies abroad or from other sources of external lending. According to World Bank (2007), the foreign debt stock of enterprises exceed the level of their domestic bank loans in Poland, the Czech Republic, Slovakia, Bulgaria and Estonia. Since foreign owned firms have easier access to external sources of lending and since they contribute considerably to output in the CEEs, the share of external financing is a significant limiting factor on the effectiveness of domestic monetary policy, which is also one reason why the level of domestic credit is low.

A number of studies have analyzed the transmission mechanism in CEEs. (For a survey of the literature, see Coricelli, Égert and MacDonald, 2006). A common finding is that the credit channel is weak and that the exchange rate constitutes the strongest channel of transmission of interest rate changes in these small open economies, although the exchange rate pass-through to prices has decreased with the decline in the rate of inflation and the volatility of exchange rates.¹⁵ Coricelli, Égert and MacDonald (2006) highlight several factors that may weaken the credit channel in the CEEs. These are the high concentration of the banking system, the large share of foreign credit institutions and the high degree of liquidity and of bank capitalisation, all of which render the banks less responsive to domestic monetary policy impulses in some of the new members.¹⁶

¹⁵ A study by the Magyar Nemzeti Bank analyzing the monetary transmission in Hungary found that investment is a more important factor affecting output changes than consumption (Magyar Nemzeti Bank, 2006). The reason for this is that because of the relatively rapid pass-through of exchange rate changes to tradable prices, an appreciation/depreciation reduces/increases the overall inflation and, given the stickiness of wages, real incomes rise in the short run when monetary policy is tightened and fall when monetary policy is loosened. On the other hand, investment reacts to the changes in tradable prices and fall when monetary policy is tightened and the exchange rate appreciates, and vice versa. It is interesting to note in this respect the finding of Angeloni et al (2003) that in the euro area, investment is the predominant driver of output changes, while in the US consumption shifts are more important.

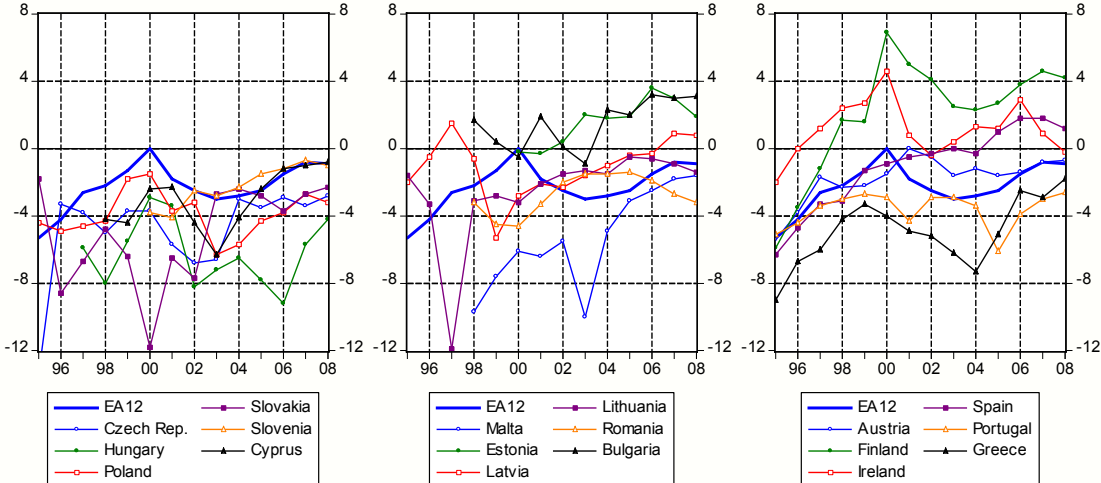
¹⁶ Using a structural time-varying coefficient vector autoregression framework, Darvas (2008b) found that the effects of monetary policy in Poland were comparable to those in the euro area, but in the Czech Republic and Hungary these effects were less powerful.

The above observations suggest that the effectiveness of monetary policy in general is limited in the CEEs, although this will change over time with financial deepening. Moreover, credit is growing fast in the new members, which implies that at the *margin*, the impact of monetary policy changes can be significant. However, in those countries which have not yet surrendered monetary policy independence, the foreign currency loans and direct external borrowings will continue to limit the effectiveness of *domestic* monetary policy as long as these channels remain an important source of credit supply.

2.5. Public finances: considerable differences across countries

The fiscal situation of the NMS exhibit considerable differences (*Graph 9*). The budgets of Bulgaria, Estonia and Latvia were in surplus in 2007 (EC 2007 autumn forecast). With the exception of Hungary, the fiscal deficits of the other countries were less than the 3% of GDP Maastricht reference value. The clear outlier is Hungary, with a deficit in excess of 9% of GDP in 2006 and 5.7% in 2007 (January 2008 estimate). Hungary followed very expansionary budgetary policies in 2002-2006 and has since embarked on a fiscal consolidation program that is expected to bring down the deficit to about 4% of GDP in 2008 and further down in the years to come.

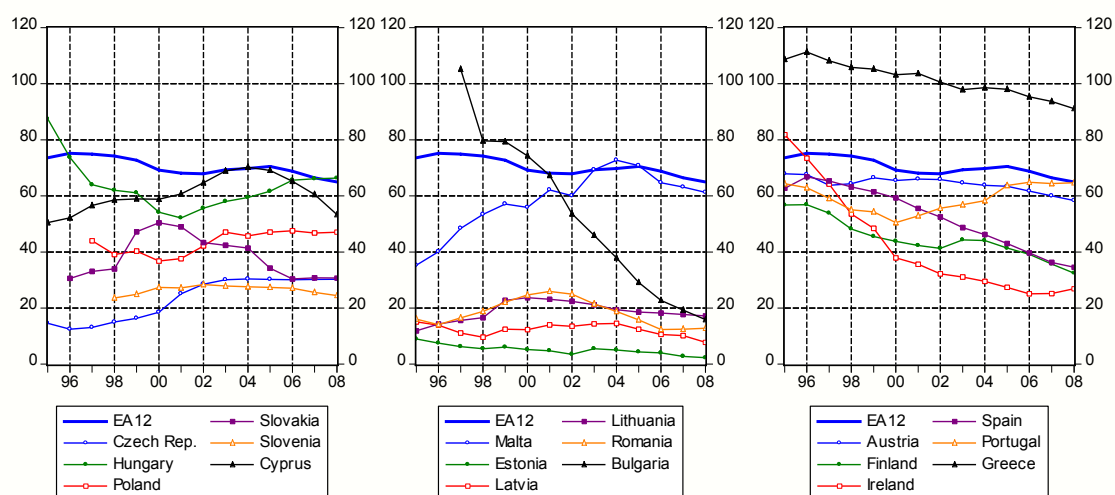
Graph 9, General government balance (in percent of GDP), 1995-2008



Sources: 1995-2006 Eurostat, 2007-2008 EC Economic forecast autumn 2007. 2007 value for Hungary is estimate of the authorities made in January 2008.

The government debt is generally low in the NMS, with the debt/GDP ratios lying well below the 60% Maastricht reference value, except in Cyprus and Hungary where it is above but close to the reference value, and Malta where the debt exceeds 100% of GDP (*Graph 10*). There are several reasons behind the low initial level of the debt in the former socialist countries. First, under the socialist regimes, part of the social safety net was borne by state enterprises, most notably in the form of within-the-gate unemployment. Second, privatization helped to keep down the debt by either using the proceeds of privatization directly to reduce the budget deficit and the debt, or by transferring the debt of the privatized companies to the new owners, which was then reflected in lower purchase prices. Third, the Baltic States did not inherit any of the liabilities of the former Soviet Union, while Poland obtained partial debt forgiveness. Romania paid back virtually all of its debt in the final years of the communist era at the cost of pushing down living standards. On the other hand, consolidation of state-owned banks prior to privatization in a number of countries added to the government debt.

Graph 10, General government consolidated gross debt (in percent of GDP), 1995-2008



Sources: 1995-2006, Eurostat; 2007-2008, EC Economic forecast autumn 2007.

The large differences in the situation of the public finances of the new members mean that the challenges faced in the fiscal area vary a great deal from one country to the other. One common element is that fiscal policy will have to play an important role in dealing with the dangers of overheating along the path of the catching-up process.

2.6. OCA conditionality standing: not worse than in the euro area countries

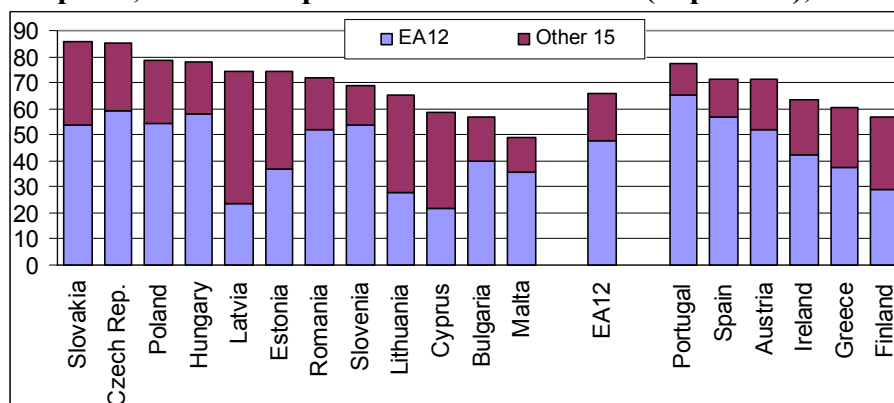
The OCA theory pioneered by Mundell (1961) to which many others have subsequently contributed posits that the benefits of membership in a currency union depend whether the countries forming such a union share certain characteristics called the OCA properties. These include business cycle comovement, convergence of economic structures, labour and product market flexibility, and financial integration. The degree to which a country satisfies the OCA criteria is an important consideration to take into account when weighing the pros and cons of joining a monetary union.

2.6.1. Trade integration and business cycle synchronization

Business cycle synchronization (BCS) features prominently among the OCA properties, because if cycles are synchronized, the cost of foregoing the possibility of using counter-cyclical monetary policy is minimized. A first step is therefore to look at the degree of BCS of the new members with the EA12. Trade integration is one of the main channels of business cycle transmission (Frankel and Rose 1998). As can be seen from *Graph 11*, the share of exports to the euro area of the four Visegrád countries (Czech Republic, Hungary, Poland, Slovakia) and Romania and Slovenia is high and even exceeds the share of a number of euro area members. On the other hand, the share of the Baltic countries is relatively low. However, if we look at the EU27, the share of the Baltic countries increases significantly, reaching a level close to the other NMS¹⁷.

¹⁷ Using a gravity model, Bussière, Fidrmuc and Schnatz (2005) find that for most of the large NMS, trade flows approached their calculated “potential” level, suggesting that while there is still room to increase their market shares in the euro area, the pace of integration will slow. On the other hand, they find that the Baltic countries still have significant scope for further trade integration with the euro area.

Graph 11, Share of exports to EA12 and EU27 (in percent), average of 2004-2006



Source: Authors' calculation based on data from IMF: Direction of Trade Statistics.

Note: Value for EA12 is the weighted average of 12 individual euro area countries. Countries are ordered according to their export share to EU27.

There is by now a large body of work on the comovement of business cycles in the NMS. Fidrmuc and Korhonen (2006) have done a meta analysis of the findings of 35 published empirical research works on the topic. Their survey of the literature reveals that the economic cycles of Hungary, Poland and Slovenia are highly correlated with the euro area cycle. The survey done by Fidrmuc and Korhonen includes work published until 2005, most of which refer to data up to 2002 or earlier. We have therefore updated for this paper our own earlier research on the topic that covered the period up to 2002 (Darvas and Szapáry, 2008a) to include now data up to the first quarter of 2007.

Graph 12 shows the correlation of GDP cycles between the NMS and the EA12 for the period 1995-2007¹⁸. GDP is the most inclusive measure of economic activity and is therefore a useful proxy for overall business cycle, even though technically business cycle synchronization means the comovement of many aggregates. With the exception of Hungary and Lithuania, the comovement of cycles has increased in all NMS since 1995-98 to levels that in some cases (especially Latvia, Slovakia, and Slovenia) exceed the level of several EA12 members. Thus, there is no apparent relationship between the degree of synchronization and the level of catching-up achieved. In Hungary, the earlier high correlation has declined in recent years, owing in part to the tightening of fiscal policy to correct an unsustainably high budget deficit and in part to a slowing in investment, reflecting to some extent the uncertainties about the macroeconomic stability of the economy in view of the large fiscal deficits and growing public debt. These developments have sharply reduced output growth in Hungary at a time when there has been an economic recovery in the euro area.

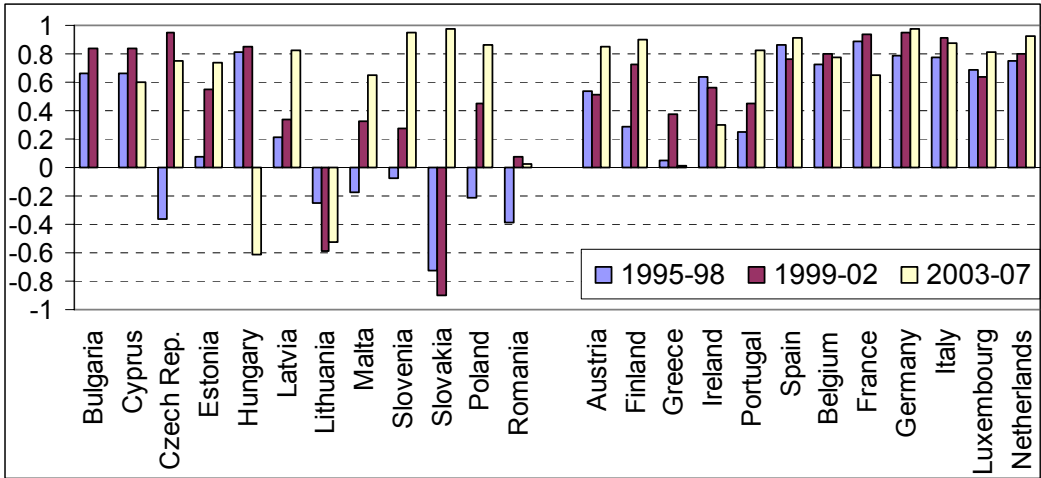
Lithuania is the only country which exhibits a negative correlation, which is due in part to the relatively high share of exports to Russia (11%) and in part to the asymmetric shocks that this country experienced (the aftermath of the Russian crisis in 1998, setbacks to the agricultural production, disruption to oil refinery). It is reasonable to expect that Hungary

¹⁸ In Darvas and Szapáry (2008a), we used five different measures to assess synchronization: contemporaneous correlation of cycles using two different methods of de-trending, the Hodrick-Prescott filter (HP) and the band-pass filter (BP); leads and lags; volatility of the cycle; persistence; and impulse-response. Since all these measures have pointed in the same direction for most countries, we discuss in this paper the updated data only for correlations and volatility, using HP and BP filters. We did not use the most popular SVAR method with long-run identifying restrictions, because it is heavily burdened with estimation uncertainty. Furthermore, Darvas (2008a) has shown that results of long-run restrictions are not robust to the sample and to the detrending method.

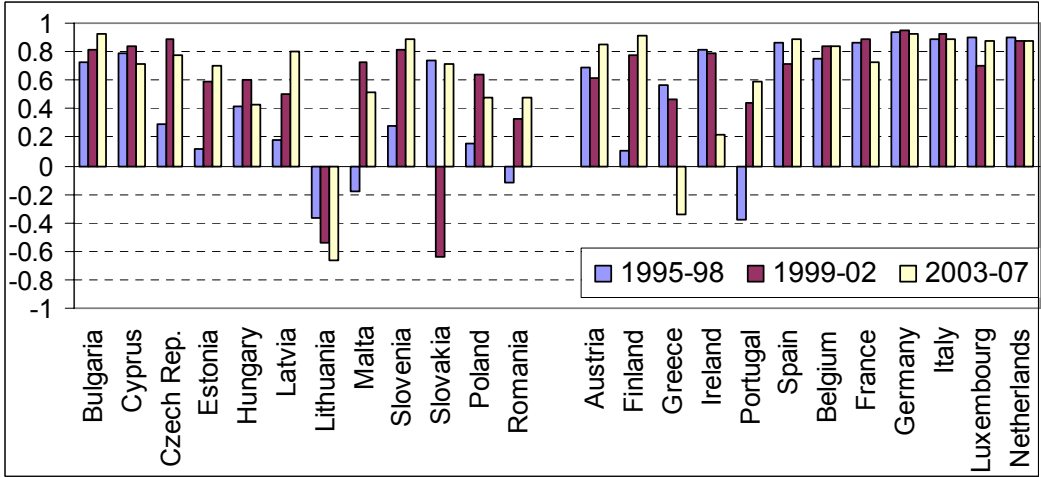
will be again on a synchronized track in the years to come as fiscal consolidation proceeds and that Lithuania will not be hit by as many asymmetric shocks in the future.

Graph 12, Business cycle synchronisation with the EA12, 1995-2007

Panel A: Using the Hodrick-Prescott filter



Panel B: Using the Band-Pass filter



Source: Authors’ calculation based on data from the Eurostat.
 Note: values shown are the contemporaneous correlation coefficients calculated on the basis of quarterly data.

Empirical research has shown that participation in a currency union itself leads to greater comovement of business cycles due to the enhanced trade integration, a phenomenon called the endogeneity of OCA (Frankel and Rose 1998). This means that a country is likely to satisfy more fully the OCA criteria *ex post* than *ex ante*.¹⁹ There is a burgeoning literature that looks at whether the European Monetary Union and the run-up to it have led to greater comovement in its members. Some part of the literature examines the correlation of cycle indicators, while another strain investigates the origin of shocks to find similarities or divergences. In a survey of the literature, de Haan, Inklaar and Jong-A-Pin (2006) conclude that while business cycles in the euro area have gone through periods of both convergence and divergence, there is quite some evidence that comovement in the euro area has increased

¹⁹ Eichengreen (1992), Bayoumi and Eichengreen (1994) and Krugman (1993) argue that a higher trade level would lead to greater specialization and hence to less synchronization. Frankel (2005) rejects this argument pointing out that a large part of trade today is in inputs and intermediate goods that give rise to positive cyclical correlations. Others (Imbs, 2004 and Fidrmuc 2001, 2004) have found that intraindustry trade is associated with positive correlations. Bun and Klaasen (2007) and Mico, Stein and Ordóñez (2003) find that the introduction of the euro has indeed increased intra-euro area trade.

during the 1990s.²⁰ Our own calculations of correlations up to the first quarter of 2007 confirm this finding. *Graph 12* shows that the correlation of GDP has increased for 9 of the 12 euro area countries since the mid-1990s using the HP filter and for about half of the countries using the BP filter. This would, *prima facie*, indicate that the forces of endogeneity have been at work for the members of the euro area, which would be a quite remarkable development considering that trade integration was already well advanced among the euro area members prior to the introduction of the euro.²¹ This is a relevant development from the perspective of the NMS, because it means that they should be less concerned with the current degree of their business cycle synchronization as this will increase further once they are in the monetary union.

The existence of fiscal rules in the EU introduces a new element of OCA endogeneity for the current and prospective members of the euro area. The Excessive Deficit Procedure stipulates that a country's fiscal deficit can not exceed 3% of GDP, which is also a Maastricht requirement for adopting the euro. The Stability and Growth Pact (SGP) further stipulates that member states should reach a balance or surplus in the cyclically adjusted primary budget balance over the medium term. Given the experience that idiosyncratic shocks are often induced by fiscal policy, the question is whether the fiscal rules foster business cycle comovement by promoting fiscal discipline. Using a panel data of 21 OECD countries and data for forty years, Darvas, Rose and Szapáry (2007) demonstrate that countries with divergent fiscal policies tend to have less synchronized cycles. They also find evidence that smaller primary deficits or higher surpluses enhance business cycle correlation. Furthermore, using a larger sample of 115 countries, they find that smaller fiscal deficits/higher surpluses are associated with less volatile business cycles. Furceri (2007) further finds that fiscal convergence reduces business cycle volatility.

These findings are by no means trivial, since idiosyncratic fiscal policy is frequently a cause of asymmetric shocks. They show that the discipline embodied in the EU fiscal rules contribute to the similarity (more correlation and less volatility) of business cycles and therefore makes the common monetary policy more suitable for the members of the monetary union.

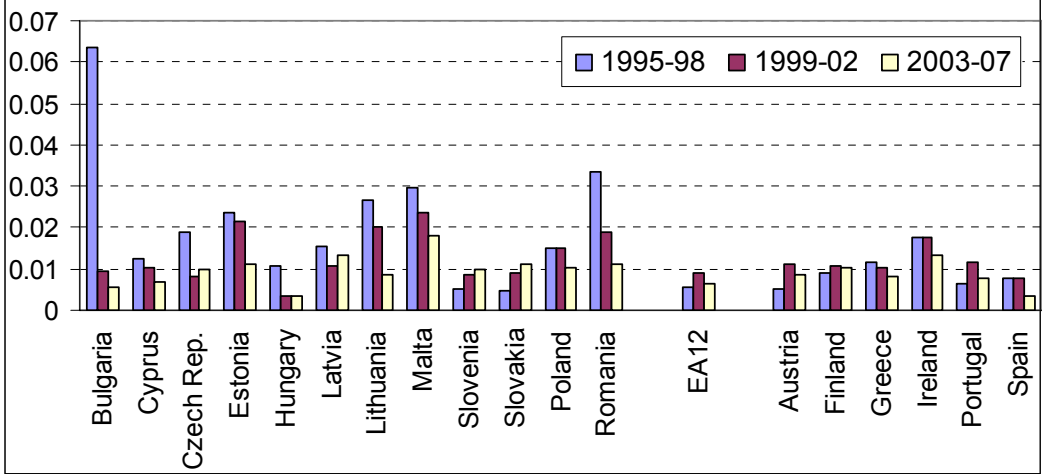
2.6.2. Output volatility and economic structures

It has been argued in the literature (Thimann, 2005) that the potentially significant differences in economic dynamics that are entailed in the catching-up process matter for monetary integration. If there are significant differences, there would be need for sufficient policy instruments to ensure macroeconomic stability. *Graph 13* shows that the volatility of GDP has been significantly reduced in all the NMS except in Slovenia and Slovakia since the mid-1990s, but remain somewhat higher than in the euro area. The reduced volatility is due to the phasing out of the initial transition shocks, the absence of major external shocks since the Russian crisis in 1998, and the more stability oriented macroeconomic policy in many countries, including most prominently fiscal policy driven in many instances by the desire to adopt the euro. There is no relationship found in these data between the level of catching-up and the volatility of output.

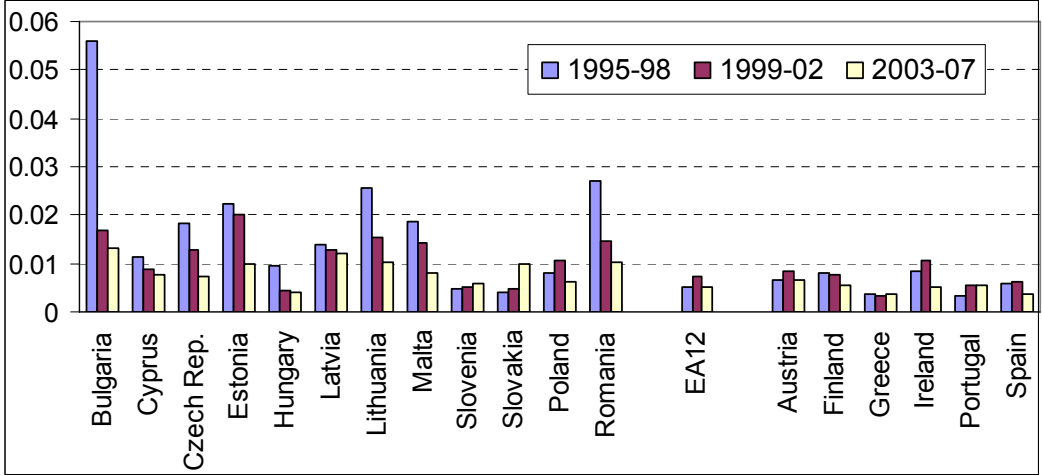
²⁰ Eickmeier (2006) using a non-stationary dynamic factor model finds that the dispersion across euro area members' output has declined in the run-up to the euro, but that heterogeneities remain. The paper also contains a good review of the relevant literature.

²¹ Gayer (2007) finds that around 2003 there was a temporary dip in business cycle synchronization in the euro area, but that since then a renewed upward trend is confirmed for almost all countries.

Graph 13, Business cycle volatility, 1995-2007
Panel A: Using the Hodrick-Prescott filter



Panel B: Using the Band-Pass filter



Source: Authors’ calculation based on data from the Eurostat.
 Note: values shown are the standard deviation of GDP cycles calculated on the basis of quarterly data.

The structure of the economy is another element that can be relevant from the perspective of business cycle synchronization. More similar are the structures of production, less likely is that countries will be subject to asymmetric shocks. As shown in *Table 5*, there is a marked trend of the share of agriculture in the NMS to decline toward euro area levels. The share of services, while lower in the NMS, is clearly converging toward the higher level of the euro area. Some convergence is also evident in the share of industry, although it is still higher in the NMS than in the euro area. The share of construction is also converging, with the notable exceptions of Estonia and Lithuania. Overall, one can say that there is a trend toward convergence, but that there are differences among the new members regarding the degree of convergence with the euro area.²² As can be seen from *Table 5*, such differences also exist among euro area members. Among the new members, Cyprus and Malta stand out in that the share of industry is the lowest and the share of services the highest, even compared to some euro area members. Among the CEEs, there is no clear pattern according to the level of development, which in part reflects the differences in relative price convergence.

²² Angeloni et al (2007) point out that part of this convergence is due to the convergence in relative prices, since in constant prices the convergence of economic structures is smaller.

Angeloni, Flad and Mongelli (2007) point out that part of this convergence is due to the convergence in relative prices, since in constant prices the convergence of economic structures is smaller.

Table 5, Structure of the economy (in percent), averages of 1995-97 and 2004-06

	1995-1997				2004-2006			
	Agriculture	Construction	Industry	Services	Agriculture	Construction	Industry	Services
Bulgaria	19.0	3.9	26.9	50.3	9.6	5.4	24.6	60.3
Cyprus	4.6	8.2	13.8	73.4	2.9	8.2	11.5	77.4
Czech Rep.	4.6	7.5	32.7	55.2	3.1	6.6	31.3	59.1
Estonia	7.6	5.9	22.2	64.3	3.6	7.3	21.3	67.8
Hungary	6.4	4.5	26.9	62.2	4.5	4.8	25.6	65.1
Latvia	7.2	4.3	25.2	63.3	4.0	6.2	15.5	74.2
Lithuania	11.8	7.3	24.3	56.6	5.7	7.8	26.3	60.2
Malta	2.9	4.6	22.9	69.7	2.8	4.7	18.2	74.3
Poland	7.4	6.9	27.1	58.7	4.7	6.0	25.0	64.3
Romania					10.9	7.3	27.3	54.5
Slovenia	4.1	5.7	29.9	60.3	2.6	5.8	28.8	62.9
Slovakia	5.6	6.6	30.8	57.1	4.3	6.7	28.7	60.4
Euro area	2.8	5.9	22.9	68.3	2.1	6.1	20.3	71.5
Austria	2.5	8.0	22.5	67.0	1.7	7.6	22.4	68.2
Finland	4.1	4.7	27.7	63.5	2.8	5.8	26.0	65.4
Greece	9.2	6.5	15.4	68.9	5.5	8.0	13.1	73.6
Ireland	6.2	5.5	32.4	55.9	2.3	9.5	27.1	61.2
Portugal	5.3	6.6	22.2	65.9	2.9	6.6	18.5	72.0
Spain	4.9	7.3	22.0	65.9	3.4	11.5	17.8	67.3

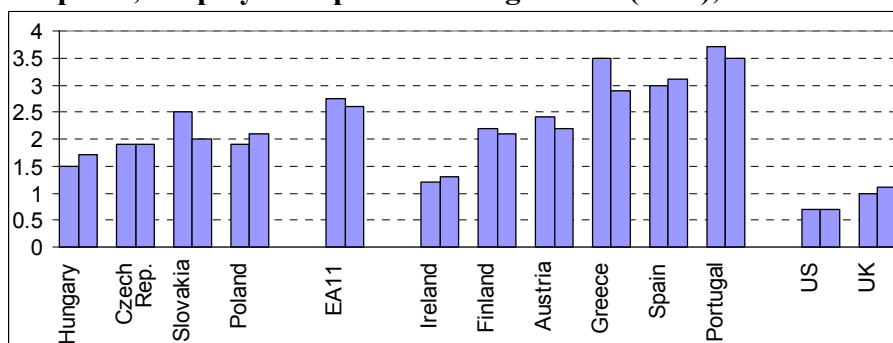
Source: Eurostat.

Note: Values shown were calculated on the basis of current prices.

2.6.3. Labour and product markets

Wage and price flexibility and labour market mobility can help adjust to idiosyncratic shocks in a monetary union. Labour market flexibility is generally measured by the strictness of employment protection legislation (EPL), spending on Active Labour Market Policies (ALMP), labour taxation, and the degree of unionization. Less stringent ELP, higher spending on ALMP, lower taxation, and lower unionization are generally seen as contributing to greater flexibility, but there are trade-offs between these measures, among which there may be complex interactions depending on the particular system in each country (European Commission, 2006a). Nevertheless, looked at in combination, they can provide a measure of the labour market flexibility in a country. Compared to euro area members, EPL is relatively less stringent in the four Visegrád countries for which OECD data are available (*Graph 14*), but the latter spend less on ALMP (*Graph 15*) and labour taxation is high in these countries (*Graph 16*). The degree of unionization varies in the Visegrád countries (*Graph 17*), but central wage bargaining is generally weak (see Riboud, Sanchez-Paramo and Silva- Jauregui, 2002, and Angeloni, Flad and and Mongelli, 2007). The trade unions under the communist regimes were an arm of the single party and the transition led to the disintegration of the power of unions. Collective wage bargaining is now typically confined to the state sector, while in the private sector the wage negotiations generally take place at the firm level (Riboud, Sanchez-Paramo and Silva-Jauregui, 2002).

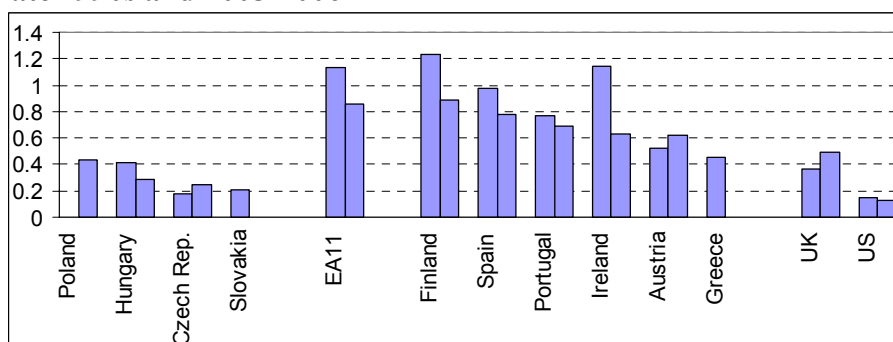
Graph 14, Employment protection legislation (EPL), late 1990s and 2003



Source: OECD Employment Outlook 2004, Table 2.A2.4 (p. 117).

Note: there are two columns for each country: the left one refers to the late 1990s and the right one for 2003. Countries are ordered (within each country group) according to their EPL index in 2003. EA11 is the weighted average of 11 old euro area members (excluding Luxembourg).

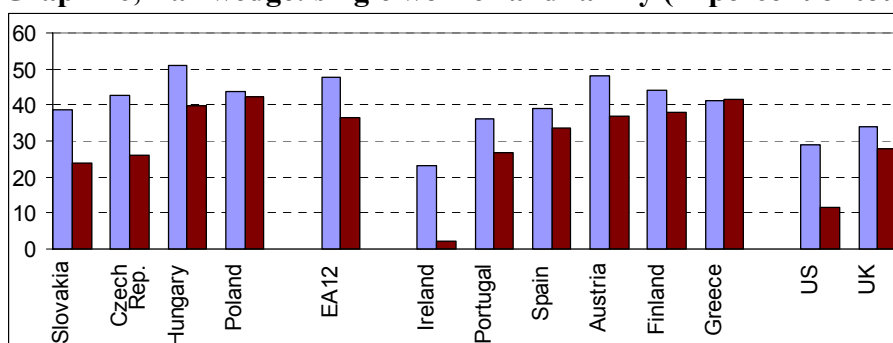
Graph 15. Expenditure on active labour market policies (ALMP) (in percent of GDP), late 1990s and 2005-2006



Source: OECD.

Note: There are two columns for each country (except Poland, Slovakia and Greece): the left one refers to the late 1990s and the right one for 2005-2006. Countries are ordered (within each country group) according to their ALMP index in 2005-2006. EA11 is the weighted average of 11 old euro area members (excluding Luxembourg).

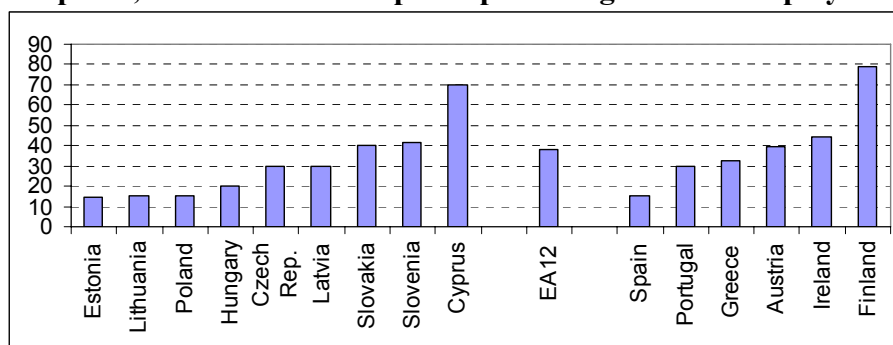
Graph 16, Tax wedge: single worker and family (in percent of total wage cost), 2006



Sources: OECD, Taxing wages 2005/2006, Table 0.1 (p. 13) and Table 0.4 (p.18).

Note: tax wedge – a measure of the difference between labour costs to the employer and the corresponding net take-home pay of the employee – is calculated by expressing the sum of personal income tax, employee plus employer social security contributions together with any payroll tax, minus benefits as a percentage of labour costs. There are two columns for each country: the left one refers to single earner without children, while the right one for one-earner married couple with two children. Countries are ordered (within each country group) according to their family tax wedge. EA12 is the weighted average of 12 old euro area members.

Graph 17, Union membership as a percentage of total employment, 1999-2001



Source: Angeloni, Flad and Mongelli (2007) Table 5.1 (p. 384).

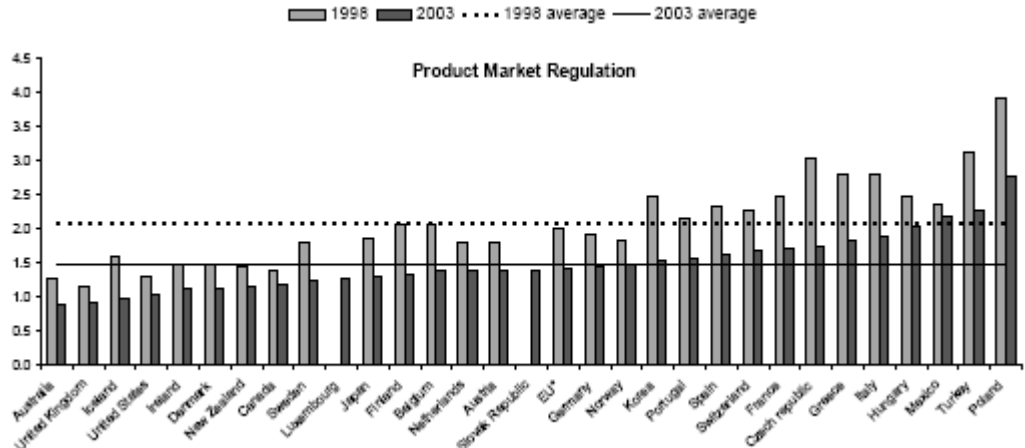
Angeloni, Flad and Mongelli (2007) report data on within-country labour mobility in the four Visegrád countries. They show that the percentage of the population changing residence domestically is low compared to the EU15. One factor that inhibits labour mobility in the NMS is the very high owner occupancy of homes which ranges between 85% to more than 90% in many of the NMS (Égert, 2007).²³ This is a result of the privatization when the State and local authorities sold the homes at cheap affordable prices to people who lived in them. When people would like to move from low-growth, low-housing price area to high-growth, high-housing price area, they are faced with the difficulty of selling their current home and buying a new one. The relatively underdeveloped transportation infrastructure renders the commuting from longer distances often unpractical.

Cross-border labour mobility is restricted by well-known factors, such as cultural and language differences, problems associated with differences in the education systems and the lack of portability of accrued benefits, such as pension rights. The role of cross-border labour mobility as an OCA requirement should not be exaggerated, however. As observed by Buitier (1999), labour mobility can not substitute for the loss of monetary policy as a counter cyclical instrument, because to do so large movements of workers would have to take place at cyclical intervals, an unrealistic expectation. Cross-border mobility can nevertheless play an important role in relieving labour shortages in countries where such shortages have emerged in some segments of the labour market, as seen, for instance, in Ireland, the UK and Spain in the recent past. It would therefore help the more efficient distribution of labour force across the EU if the old members removed the remaining restrictions on the inflow of labour from the new members.

Product market competition increases price flexibility and enhances the allocation of resources. From the perspective of monetary union, flexible prices help absorb the effects of asymmetric shocks. During the transition process, the former socialist countries have moved from a highly regulated to a liberal product market system. According to an OECD study (Conway, Janod and Nicoletti, 2005), on a scale of relatively liberal to relatively restrictive product market regulation indicator (PMR), the Czech Republic, Hungary and Poland are situated on the relatively restricted end among the Visegrád countries, while Slovakia is close to the relatively liberal end (*Graph 18*).

²³ Slovakia is the only exception where owner occupancy is 49%.

Graph 18, Product market regulation (PMR)



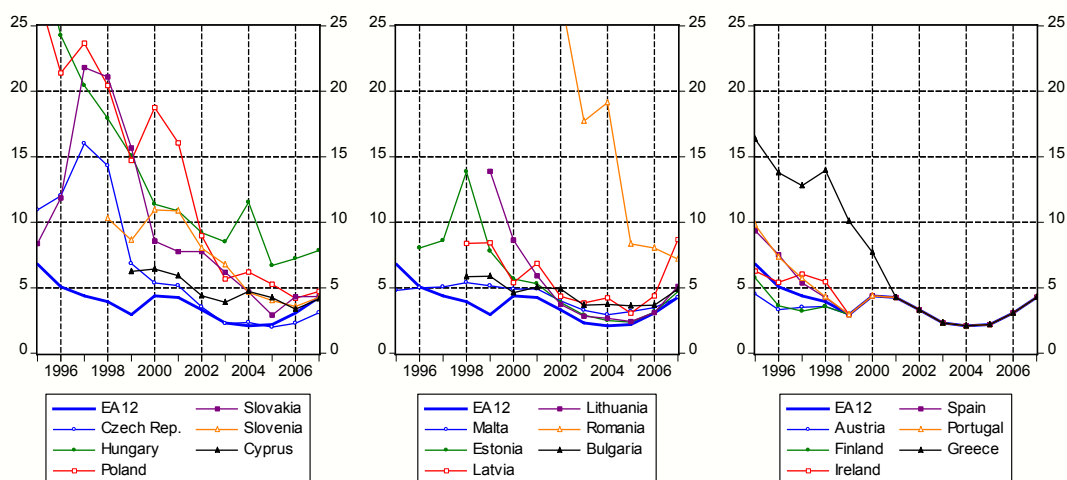
Source: Conway, Janod and Nicoletti (2005), Figure 8 (p. 18).

2.6.4. Financial integration

Financial integration is considered as one of the OCA properties, since it enhances risk pooling and consumption smoothing, improves the effectiveness of the transmission of the common monetary policy and, through the pooling and channelling of resources to investment opportunities, improves the allocation of resources. Hence, it promotes growth and helps adjust to idiosyncratic shocks. Financial integration is usually measured by the integration of money, bond and equity markets, cross-border holdings of financial assets, the cross-border integration of banking systems, and whether the institutional setups ensure a common set of rules and provide equal access and treatment of market participants (Ferrando et al, 2004). By adopting the *acquis communautaires*, the NMS by and large satisfy the institutional requirements.

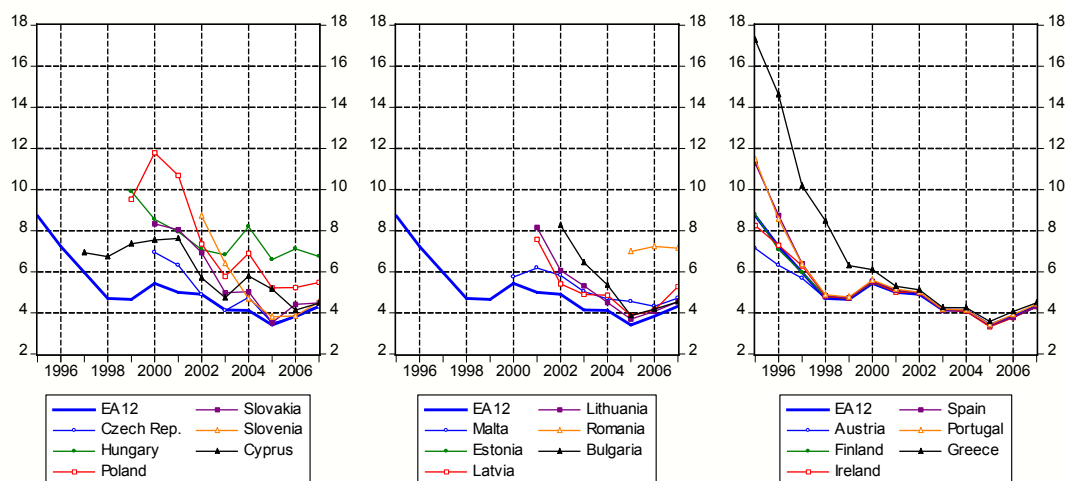
Regarding the integration of money and bond markets, *Graphs 19, 20 and 21* show, respectively, the 3-month money market rates, the ten-year bond market interest rates and their spreads against the euro rates. There has been a substantial convergence of the nominal interest rates in the NMS towards the lower levels prevailing in the euro area. This convergence has been driven in part by the decline in risk premia, reflecting the more stability oriented macroeconomic policies in the NMS and market expectations that they will adopt the euro following a relatively short period of time after their entry into the EU. In addition, the search for yields in the environment of abundant global liquidity has increased the markets' risk appetite, generating substantial portfolio capital inflows into many of the NMS. The spreads are particularly low in Estonia, Lithuania and Bulgaria which operate fixed exchange rate regimes and in the new euro area members Cyprus, Malta and Slovenia. In the ERMII member Slovakia with +/-15% exchange rate band, the spreads are also minimal, reflecting the appreciation of the exchange rate and expectation of early euro area entry. In the Czech Republic, the spreads are actually negative, consistent with the appreciating exchange rate and expectations for further appreciations.

Graph 19, Three-month interbank interest rates, 1995-2007



Source: Eurostat.

Graph 20, 10-year government bond yields, 1995-2007



Sources: Eurostat and ECB.

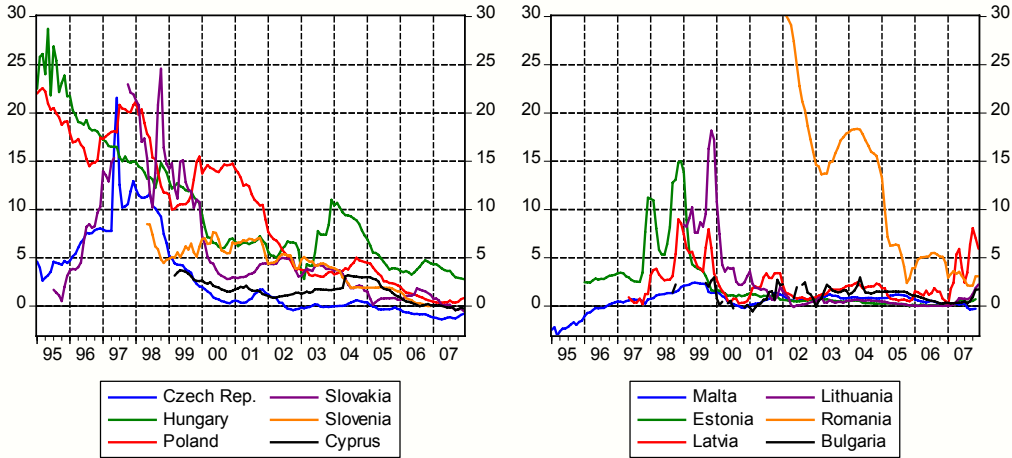
Unlike in the other countries with fixed exchange rate regimes, the spreads in Latvia, which joined ERMII in May 2005, have sharply increased both for the short- and long-term interest rates since 2006. This is partly a consequence of the overheated economy and a weakening of competitiveness (see later), which resulted in very large current account deficits and accelerating inflation, and is a clear warning sign that ERMII membership and the Government's strong desire to enter the euro area is not a watertight umbrella against changes in the markets' risk assessment. In Hungary, the spreads have remained high since 2003, owing to the markets heightened risk assessment caused by this country's large fiscal and current account deficits and high inflation. In Romania, the spreads have plunged from very high levels, but are still, together with Hungary and Latvia, the highest in the NMS.

The cross-border integration of the banking systems of the NMS is high, owing to the very important share of foreign-owned banks in the total assets of the banks, except in Slovenia, Cyprus and Malta (*Table 6*). In the other countries, it ranges from about 60% in Latvia and Romania to over 90% in Estonia, Slovakia and the Czech Republic. The high shares in the CEEs are a result of the privatization of banks to strategic foreign investors and of letting in foreign banks to set up new banks. This was a way of infusing capital into the

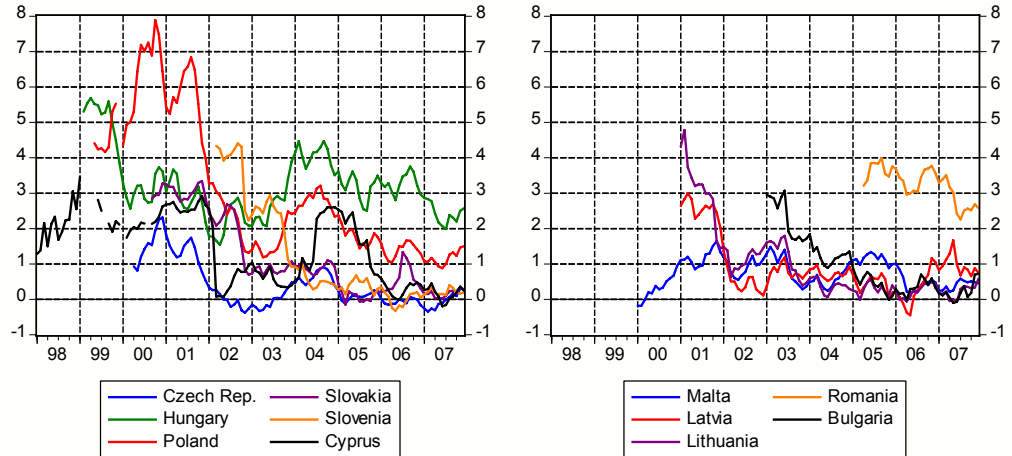
domestic banking system and was seen as transferring management know-how, especially in risk analysis and risk management, as well as bringing in new financial products.

Graph 21, Interest rate spreads vs. EA12

Panel A: Spread of three-month interest rates vs. EA12, January 1995 – December 2007



Panel B: Spread of ten-year interest rates vs. EA12, January 1998 – December 2007



Sources: Eurostat, ECB, Datastream.

Table 6, Share of foreign credit institutions in total assets (in percent), 2005

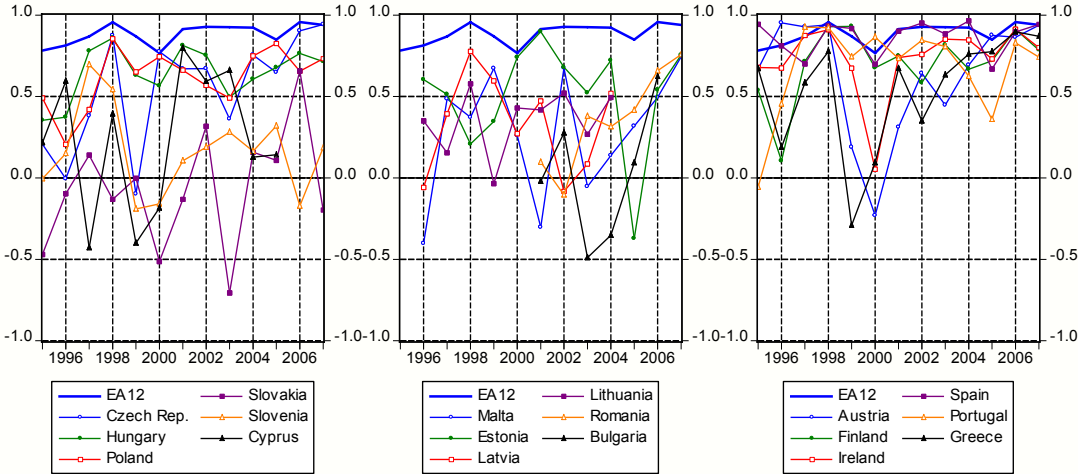
	2005		Total
	EU country banks	Third country banks	
Bulgaria			73
Czech Republic	88.7	4.7	93.4
Estonia	99.2		99.2
Cyprus	22.2	5.4	27.6
Latvia	50.1	3.1	53.2
Lithuania			92
Hungary			82
Malta	32.4		32.4
Poland	58.7	8.4	67.1
Romania			63
Slovenia			34
Slovakia	97.4		97.4

Sources: ECB, World Bank (2007)

With respect to the integration of the equity markets, *Graph 22* shows the correlation of monthly share price changes in the NMS with the euro area share prices. One can observe a trend toward unity, that is, toward greater comovement with the share prices in the euro area, but there are still significant country specific shocks, as apparent from the fluctuations in the correlation coefficients. To a great extent, this is a reflection of the small size of the equity markets in the CEEs (*Graph 23*). The stock market capitalization was below 40% in all CEEs in 2006, except the Czech Republic, Estonia and Poland and was less than 10 % in Bulgaria, Latvia and Slovakia, compared to an average of close to 60% in the euro area. In addition, non-residents tend to dominate the stock exchanges in the CEEs. In Hungary, for instance, non-residents hold about 80% of the shares quoted on the Budapest Stock Exchange. As a result of these features, relatively small amounts of foreign capital flows by international standards trigger large fluctuations in share prices.

There are several reasons behind the small size of the equity markets. First, as a result of privatization and FDI inflows, most of the large companies are subsidiaries of multinational firms whose shares are listed in their home country and/or in other major stock exchanges. Second, wealth accumulation in the NMS is still relatively limited which, coupled with a certain risk aversion, have channelled the savings into safer forms, such as government securities and real estate. Finally, institutional investors, such as pension funds and insurance companies, have started to accumulate investable funds relatively recently. The cross-border holdings of financial assets and therefore risk pooling, while slowly trending up, are still small in the NMS (relevant data are reported in Darvas and Szapáry, 2004).

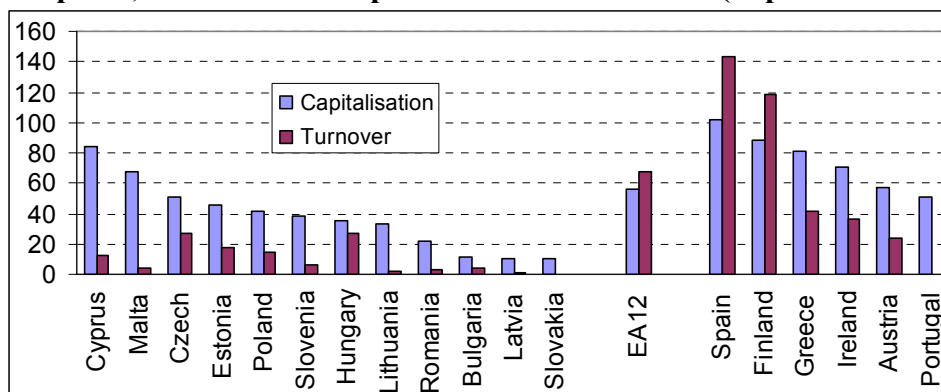
Graph 22, Correlation of monthly share price changes with euro area share price changes, 1995-2007



Source: Authors’ calculation based on data from the Eurostat.
 Note: euro area share price index is represented by the “Dow Jones EURO STOXX Broad” index; EA12: weighted average of country-specific correlations of 12 old euro area members; Values for 2007 refer to the period January-June.

While financial integration is a welcome development from the point of view of risk sharing and efficient allocation of resources, it also increases the vulnerability to financial shocks due to changes in market sentiment and contagion. The risks of contagion are heightened by the integration of the banking systems as a result of the large share of foreign owned banks in the NMS. Financial shocks can upset the OCA conformity of the euro area candidate countries, at least temporarily. With financial integration, the burden on policies to maintain macroeconomic stability has greatly increased, a topic to which we will return later.

Graph 23, Stock market capitalisation and turnover (in percent of GDP), 2006



Source: Eurostat.

Note: stock market capitalisation is the end of year capitalisation divided by annual GDP. Turnover: annual turnover divided by annual GDP. 2004 values for three Baltic States, EA12 and Finland. Countries are ordered (within both groups) according to their stock market capitalisation per GDP.

2.6.5. Sum up

To sum up this section on OCA conditionality, one can observe a definite trend toward greater comovement of business cycles between the new members and members of the euro area, with some of the new members' cycles even more synchronized than those of certain current euro area members. This can be seen as a sign that the new members have been exposed to less and less idiosyncratic shocks. The question of sufficiency has to be raised, however. As pointed out by Artis (2003), there is nothing in the relevant theory to establish what degree of synchronization is needed to participate in a currency union. It may be enough to be assured that the new entrant is not substantially more idiosyncratic than those already in. This is even more so considering the empirical evidence that there are forces of endogeneity at work within the euro area. An important new element of endogeneity is the enhanced fiscal discipline embodied in the EU fiscal rules which tends to reduce the likelihood of idiosyncratic fiscal policy, a frequent source of asymmetric shocks.

Labour markets appear to be more flexible in the new than in the old members, although the significance of this difference should not be over estimated. Product markets, on the other hand, are more restricted. Financial integration has considerably advanced between the new members and the euro area and there is evidence that forces of endogeneity are at work within the euro area in this respect as well (De Grauwe and Mongelli, 2005). However, risk pooling is still very weak. Overall, with regard to the traditional OCA criteria, the new members are not in a worse position - and in some cases are even in a better position - to join the monetary union than were the old members when they adopted the euro.

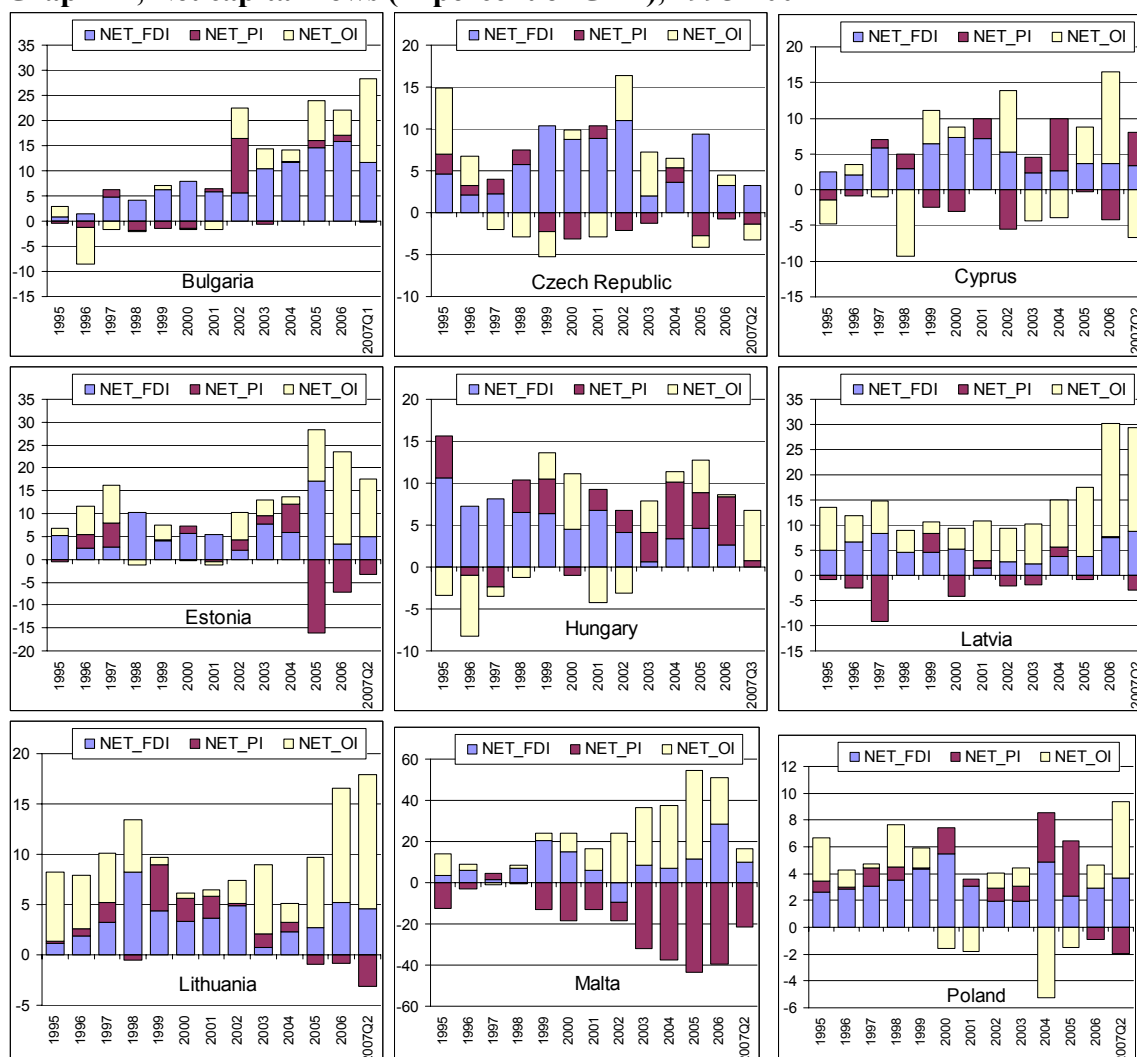
3. Risks, Challenges and Long Term Strategies

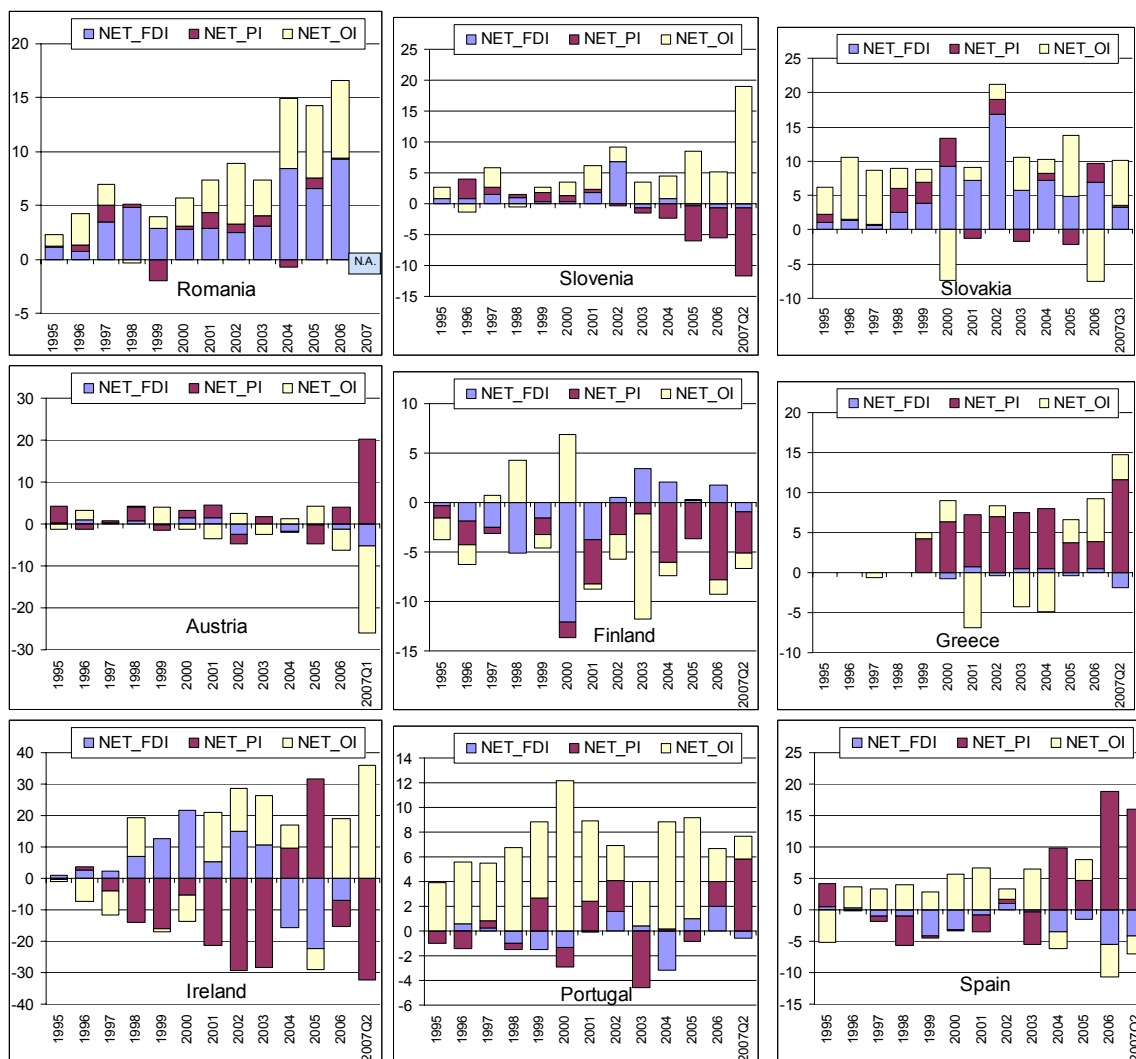
The preceding review of the initial conditions of the new members allows focusing on some of the key risks and challenges facing these countries on the road to euro adoption and beyond, as well as on the long term strategies to deal with these challenges. We see the main risks as those associated with the exposure to large and volatile capital flows and the danger of overheating owing to credit booms.

3.1. Capital flows: several risks

The NMS have experienced considerable net capital inflows in the form of FDI, portfolio capital, and capital of other nature (*Graph 24*). FDI has gone into these countries to exploit profitable investment opportunities. The intensity of FDI has depended on such factors as the pace of privatization, the evolution of the legal and institutional environment and the absorbing capacity in the individual NMS. It has been also influenced by the macroeconomic situation and prospects in both the originating and recipient countries. Although at times FDI inflows can experience big swings from one year to another, from a macroeconomic stability point of view these swings constitute less of a risk, since they can mostly be anticipated and thus better handled.

Graph 24, Net capital flows (in percent of GDP), 1995-2007





Sources: IMF: International Financial Statistics; 1997-2007 values for Slovakia and 2007 values for Hungary are from the national central banks.

Note: NET_FDI: net FDI inflow; NET_PI: net portfolio investment inflow; NET_OI: net other investment inflow.

The more serious risks lie in the non-FDI capital flows which are sensitive to interest rate differentials and risk premia. Most NMS have experienced strong non-FDI capital inflows boosted by the markets' expectation of these countries joining the euro area. The inflows have been driven by the initially higher domestic nominal interest rates and the expectation of yield convergence ahead of euro adoption, as well as by the favourable growth prospects. In the countries with floating exchange rates, the inflows have been at times reinforced by expectations that policy makers will not fully counteract the nominal appreciation of the exchange rate caused by these very capital inflows because of their concern with inflation. In many new members, the problem has been compounded by the foreign currency borrowings driven by strong domestic demand for credit. Boosted by such borrowings, the non-FDI net capital inflows have been especially large in countries with fixed exchange rates, representing about 30% of GDP in Latvia, 20% in Estonia and over 15% in Lithuania in 2006-2007. In the Czech Republic, Poland and Slovakia with floating rates, these inflows have been significantly smaller. Romania, in contrast, had large yield differentials which boosted capital inflows. In Hungary, where the yield differential has been also large, the non-FDI capital inflows mostly took the form of portfolio investment into government securities.

The danger in such large inflows of capital is that they boost domestic demand and lead to large current account deficits and high inflation. They can also put undue upward pressure on the exchange rates of countries with floating rate regimes, threatening an erosion of competitiveness that might force the authorities to lower interest rates to levels inconsistent with the goal of price stability and/or forcing them to undertake costly interventions.

Portfolio capital inflows have been driven by the search for yields in the global environment of low interest rates and high liquidity which have raised the level of global risk appetite. Risk premia have shrunk and interest rates have fallen even in instances where the fundamentals would have justified higher risk premia under other circumstances. This can have the pervasive effect of making policy makers believe that the willingness of investors to buy and hold domestic financial assets is a vote of confidence, delaying needed reforms and letting the authorities indulge in policies that are clearly unsustainable. A case in point is that of Hungary, where despite fiscal deficits ranging between 6% to 9.2% of GDP and similarly high current account deficits during 2002-2006, non-resident holdings of government securities have increased.

The reliance on foreign exchange swaps have allowed leveraged speculators to hedge against the exchange rate risk and ride out periods of market turbulence without off loading their holdings. While this can be a stabilizing factor under circumstances of temporary uncertainties, hedging makes the exit also less costly and hence increases vulnerability. Although most of the portfolio inflows into the new members come from buy-and-hold institutional investors, leveraged speculators can account on occasion for a non negligible portion of the capital inflows. By virtue of the mere size of the potential portfolio shifts relative to the small size of the capital markets of the NMS, a reversal of capital, due to loss of confidence or contagion, can trigger large destabilizing movements in the exchange rates and domestic interest rates. Hungary has experienced such sudden shifts in 2003 and again in 2006 when doubts arose about the policy intentions of the authorities. Latvia, which has the largest current account deficit among the NMS also experienced in March 2007 pressures against its unilaterally maintained +/-1% exchange rate band within ERMII.

The large inflows of capital, therefore, entail several risks: (i) by boosting domestic demand, they can lead to overheating and large current account deficits and high inflation; (ii) they can put undue upward pressure on the exchange rates of countries with floating rate; (iii) they might delay needed adjustments by giving the authorities time to indulge in inappropriate policies; and (iv) they expose the countries to sudden reversals of capital flows if there is a shift in the markets' assessment of a country's vulnerability.

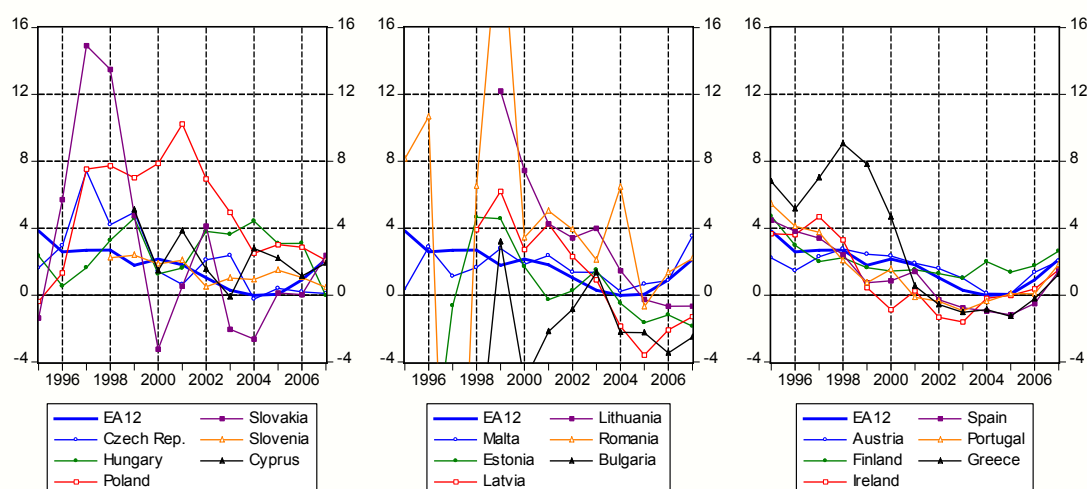
3.2. Danger of credit booms and overheating: the great challenge

The rapid expansion of credit and the consequent danger of overheating and inflation is one of the greatest challenges facing the NMS, irrespective of whether they are members or not of the euro area. Both demand and supply factors combine to boost credit expansion.

On the demand side, the initial low level of credit and of indebtedness, the rapid output growth, the rise in income expectations and the stronger confidence boosted also by EU entry have led to a greater willingness of economic agents to take on debt. This has been particularly true for households. The demand for credit has been fuelled by the sharp decline in real interest rates. The fall in risk premia and the convergence of domestic interest rates toward euro levels driven by the inflow of convergence capital buoyed by euro area entry expectation, together with higher inflation owing to the BS effect or other reasons, have

produced very low or even negative domestic real interest rate (*Graph 25 and Table 7*). This environment of low borrowing cost has been compounded in several countries by the use of foreign currency and external loans as mentioned above.

Graph 25, Real 3-month interbank interest rates (using past inflation), 1995-2007



Source: Authors' calculation based on data from Eurostat (3-month interest rate and HICP since 1997) and IMF (CPI up to 1996).

Table 7, Interest rate and total charges for household loans, averages of 2004-2007

	Domestic currency loans		Euro loans	
	Housing	Consumer	Housing	Consumer
(A) Loan rate spread over 3-month interbank interest rates (in percentage point)				
<i>(A1) Total rate of charge</i>				
Czech Republic	2.4	11.6	n.a.	n.a.
Hungary	5.1	19.5	3.2	8.2
Poland	2.0	16.6	2.5	5.7
<i>(A2) Interest rate (other charges not included)</i>				
Bulgaria	5.4	9.1	n.a.	n.a.
Cyprus	2.3	5.1	n.a.	n.a.
Estonia	1.2	14.9	1.4	3.4
Lithuania	1.6	4.7	1.3	2.0
(B) Real interest rate (deflated with past inflation) (in percent per annum)				
<i>(B1) Total rate of charge</i>				
Czech Republic	2.9	12.0	n.a.	n.a.
Hungary	7.4	21.1	0.9	5.6
Poland	4.7	18.9	3.0	6.1
<i>(B2) Interest rate (other charges not included)</i>				
Bulgaria	2.4	5.9	n.a.	n.a.
Cyprus	4.3	7.0	n.a.	n.a.
Estonia	-0.1	13.1	0.0	1.8
Lithuania	1.1	4.2	0.6	1.3

Sources: National central bank websites.

Note: 'Total rate of charge' (which corresponds to 'Annual percentage rate of charge' in the terminology of Eurostat and national central banks) is not available for Bulgaria, Cyprus, Estonia and Lithuania. For the Czech Republic, Hungary and Poland, for which both the 'Total rate of charge' and the 'Interest rate' are available, the former was larger by 1.0 percentage point for housing loans and by 4.7 percentage points for consumer loans on average for these three countries during the period 2004-2007.

On the supply side, the development of the banking sector after privatization and the predominance of foreign banks increased the lending capacity of banks. At the same time, rising competition among banks to expand their activity in the household sector once the corporate sector has been saturated, together with the narrowing of margins due to the fall in interest rates, have constituted strong incentives for banks to lend to households to maintain profitability.

The fastest growing segments of the credit market have been household loans, in particular mortgage loans (*Graph 26*). The latter have been also encouraged by deregulation in the property market and by the rapid rise in property prices and the expectation of further price increases which have encouraged speculative buying, including by non-residents. Just like total domestic credit, the credit to households has also risen the fastest in the five less developed NMS, i.e., the Baltic countries, Bulgaria and Romania, where the starting levels of credit were the lowest.

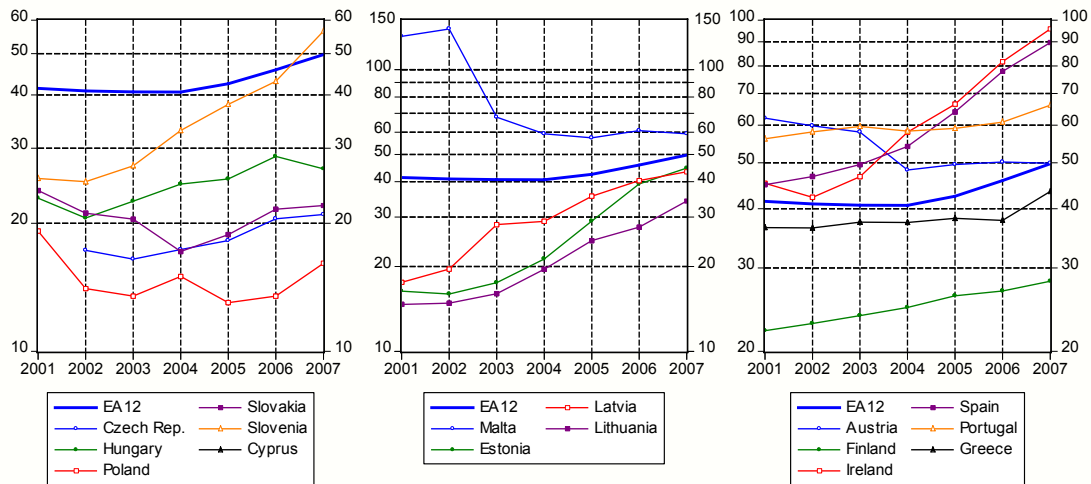
Several studies have made estimates of the equilibrium level of credit in the CEEs looking at explanatory variables, such as per capita GDP, real interest rate, inflation, a proxy for financial liberalization, etc (Schadler et al 2005; Kiss, Nagy and Vonnák, 2006; Égert, Backé and Zumer, 2006; World Bank 2007). A common finding of these studies is that credit in the CEEs is generally below equilibrium levels, highlighting the potential for further rapid expansion of credit. However, the *speed* at which the equilibrium level of credit is reached matters for macroeconomic stability.²⁴ From the perspective of inflationary pressure, it is not the level but the rate of growth of credit that matters.

Several dangers emanating from excessive credit growth must be reckoned with. First, it feeds inflation and wage growth that can erode competitiveness not only in countries with fixed exchange rates, but also in countries with floating rates, if the demand for credit-generated external capital continues to flow in and place upward pressure on the exchange rate. The rates of inflation, after falling in all new members since the mid-1990s, have picked up speed in recent years, in particular in the Baltic States and Bulgaria, and also in Hungary for the specific reasons mentioned earlier (*Graph 27*). In the four former countries, nominal wage growth has also risen significantly (*Graph 28*) and unit labour costs, particularly in Latvia, have increased at a very rapid pace in recent years (*Graph 29*).

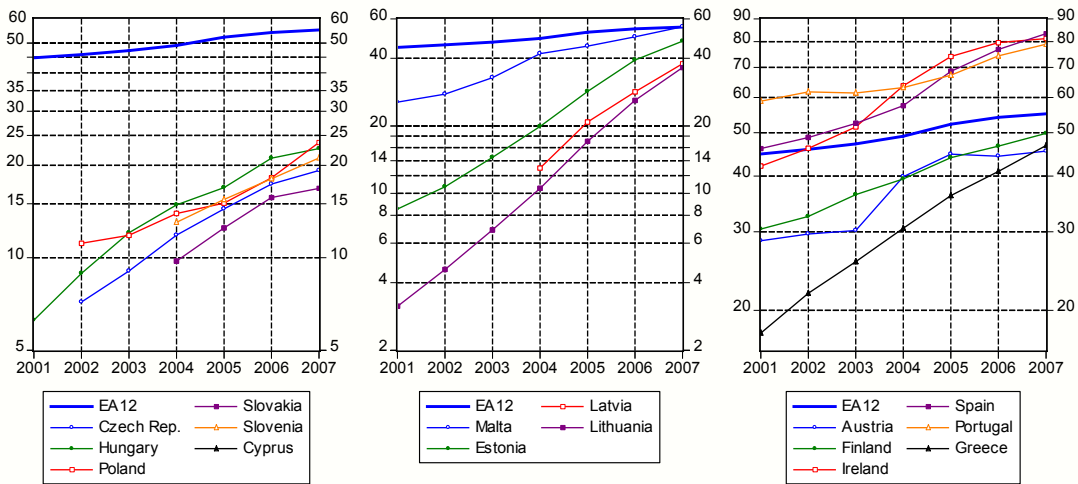
²⁴ Égert, Backé and Zumer (2006) estimate that credit in Bulgaria, Estonia, Hungary, Latvia and Slovenia have approached the estimated equilibrium level.

Graph 26, Bank loans to the corporate and household sectors, 2001-2007

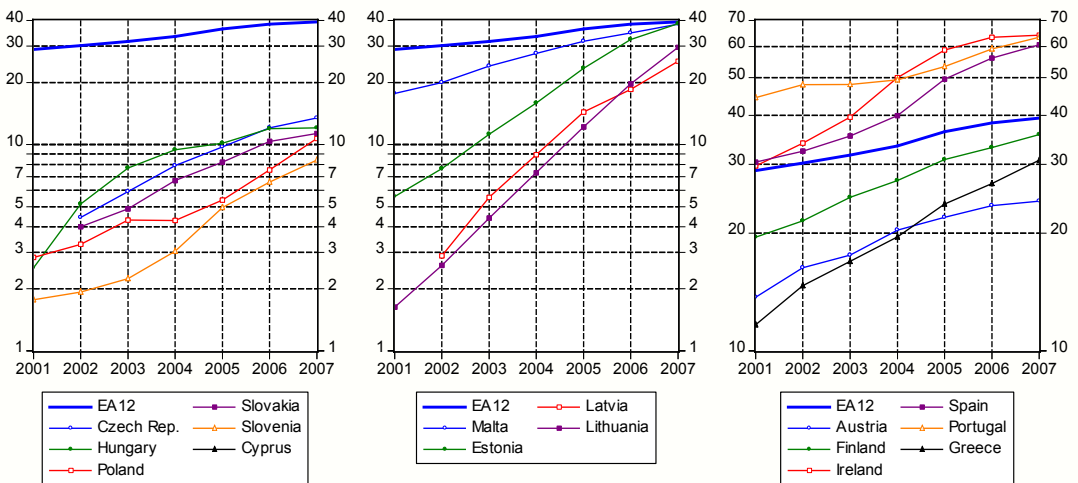
Panel A: Loans to non-financial corporations (in percent of GDP)



Panel B: Loans to households (in percent of GDP)



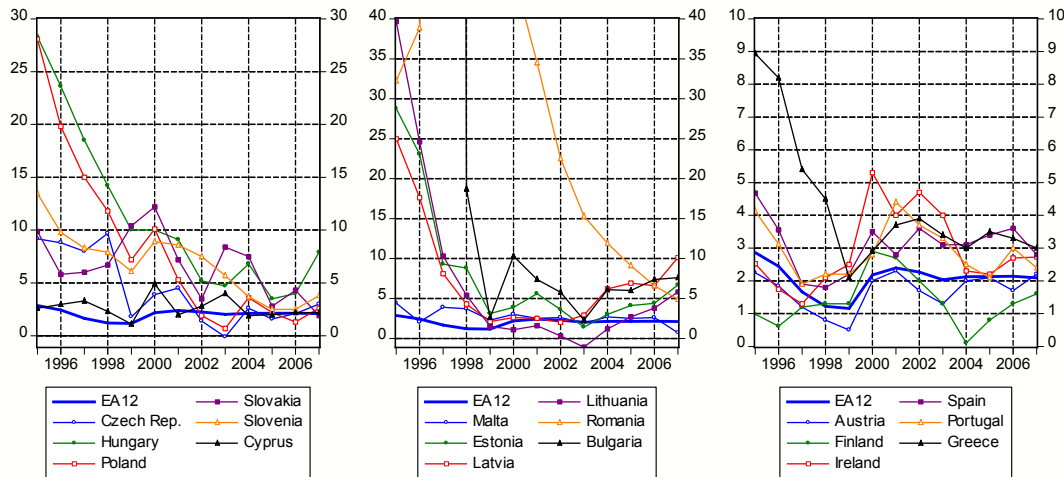
Panel C: Mortgage loans to households (in percent of GDP)



Source: Eurostat.

Note: Data is available till June 2007. Values shown for 2007 assume that the growth rate of loans from June to December 2007 is the same as from December 2006 to June 2007.

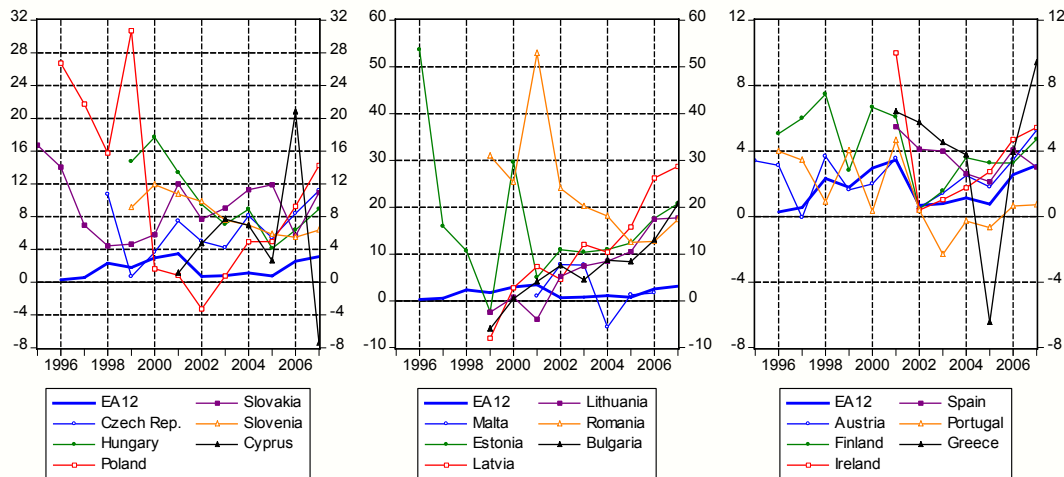
Graph 27, Inflation rate (in percent), 1995-2007



Sources: Eurostat (HICP) and IMF, IFS (CPI).

Note: Annual average change in Harmonized Indices of Consumer Prices (HICP) since 1997, CPI for 1995-1996. For Bulgaria, change in HICP is available only since 1998.

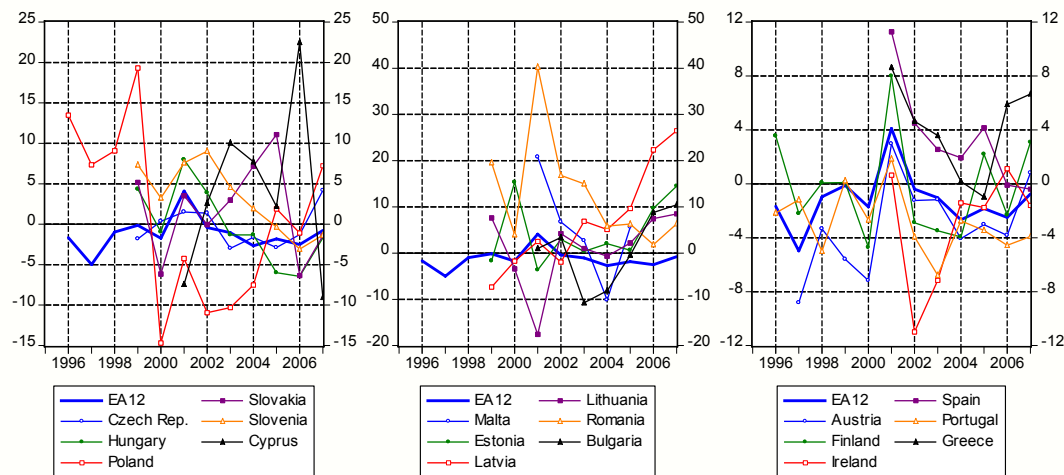
Graph 28, Nominal wages in manufacturing (annual growth in percent), 1995-2007



Source: Eurostat.

Note: the scaling of the vertical axis is different for the three panels. Values for 2007 are projected using data up to 2007Q3.

Graph 29, Unit labour costs in manufacturing (annual growth in percent), 1995-2007



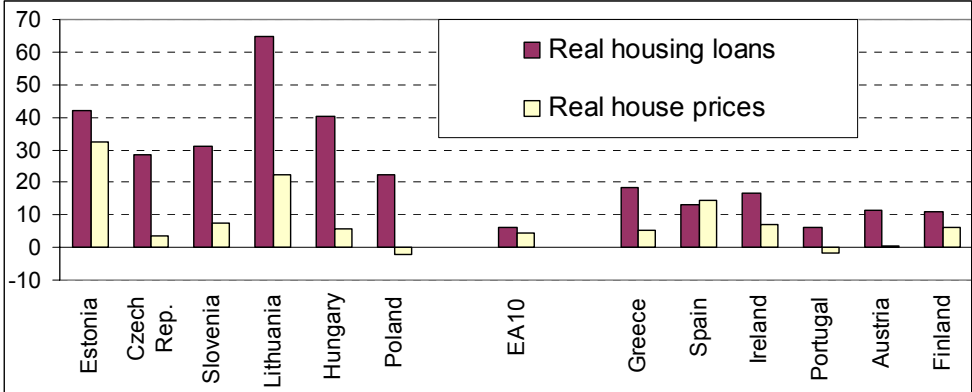
Source: Eurostat.

Note: the scaling of the vertical axis is different for the three panels. Values for 2007 are projected using data up to 2007Q3.

A point to emphasize here is that if the risk premium is not rising, either because a hard peg is credible, such as may be under currency boards in the Baltics and Bulgaria, or because of the perspective of euro area entry in the case of floating exchange rates, then the credit boom and the consequent rise in inflation further lower the level of real interest rates. In this way, the interest rate acts in a pro-cyclical fashion, giving further impetus to credit expansion. Since the higher inflation takes place essentially in the non tradable sector, the lowest real interest rates will prevail in that sector, channelling the resources away from the tradable sector. This mechanism will continue to apply also once a country has joined the euro area.

A second danger to reckon with is that the rapid growth in mortgage credit can lead to sharp rises in house prices in real terms. Égert and Mihaljek (2007) report real house price increases of between 20% and 30% per year in Estonia and Lithuania during 2000-2006 (*Graph 30*). In the other CEEs for which they report data, the house price increases have remained more modest, but if mortgage credit continues to expand at a fast rate, housing price bubbles might well develop. Such bubbles might further boost credit expansion by increasing the value of collaterals. During credit booms, the risks generally rise because banks become willing to lend to less creditworthy customers, exposing the banks to heavy losses when the bubbles burst.

Graph 30, Real house prices and real housing loans (annual average change from 2001 to 2006, in percent)

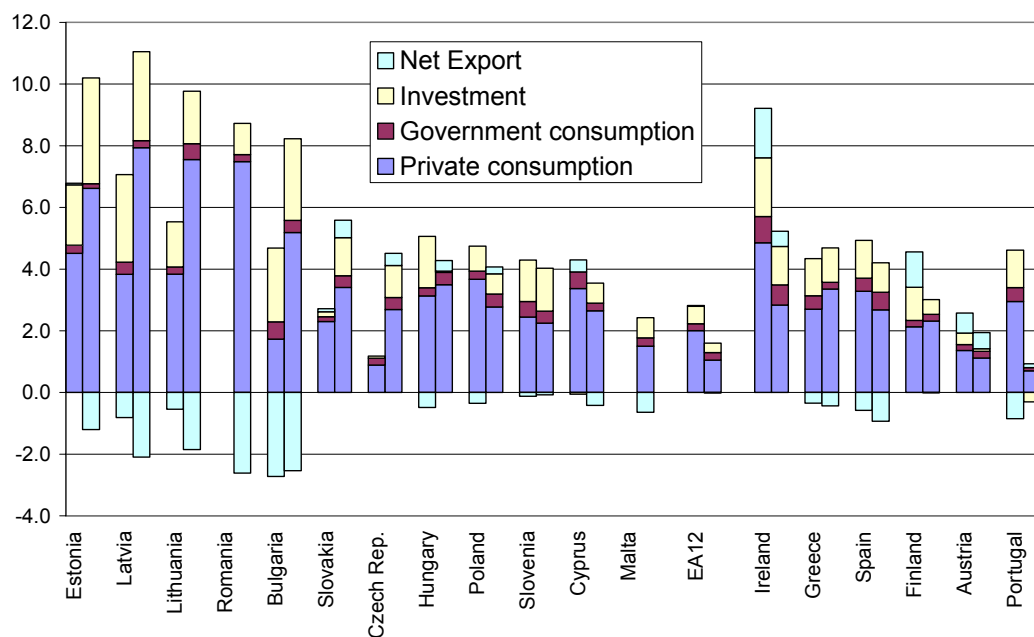


Sources: Authors' calculation based on the following data sources: CPI from IMF, IFS; house prices from Égert and Dubravko (2007); housing loans from Eurostat.

Note: real house prices: annual average percent change of house prices in excess of CPI inflation; real housing loans: annual average percent change of the stock of housing loans in excess of nominal GDP growth. EA10: weighted average of 10 old euro area members excluding Italy and Luxembourg.

Third, the rapid expansion of credit has fuelled consumption. As can be seen from *Graph 31*, the contribution of private consumption to GDP growth has increased in all CEEs between 1997-2001 and 2002-2006, except in Poland and Slovenia. The problem with the rapid growth of consumption is that it keeps savings low and increases the investment-saving gap. The five less developed NMS where credit expansion has been the fastest have recorded very large current account deficits, ranging from about 15% in Estonia to about 24% in Latvia in 2007 (*Graph 32*). In Bulgaria and Romania, a large part of the deficits have been financed by FDI, as these countries have attracted foreign investment with the prospect of EU entry. In contrast, in the Baltic countries, most of the deficits have been financed by debt, principally foreign borrowing by banks and enterprises (*Graph 24*). External debt levels have increased sharply, especially in Latvia where it reached over 110% of GDP in 2006 (*Table 8*). When the counterpart of indebtedness is consumption and housing loans, it means that resources are diverted away from investment in the tradable sector which is bound to negatively affect competitiveness and growth down the road.

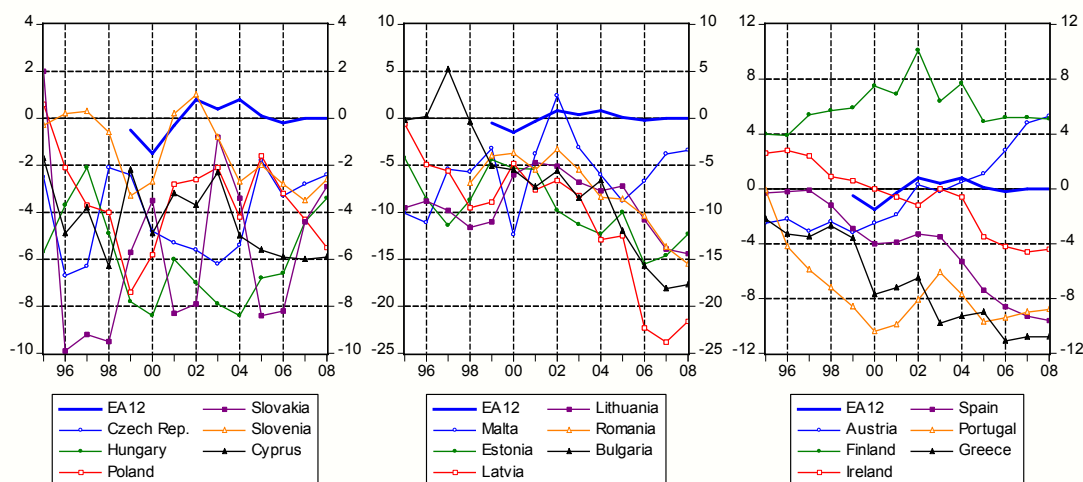
Graph 31, Contribution to GDP growth, averages of 1997-2001 and 2002-2006 (in percentage point)



Source: Authors' calculation based on data from Eurostat.

Note: there are two columns for each country (except Romania and Malta): the left one refers to 1997-2001 and the right one to 2002-2006. Countries are ordered (within both country groups) according to their average GDP growth rates in the 2002-2006 period. The average GDP growth rate is the sum of the four components shown.

Graph 32, Balance of the current account (in percent of GDP), 1995-2008



Sources: 1995-2006 Eurostat, 2007-2008 EC Economic forecast autumn 2007.

Note: the scaling of the vertical axis is different for the three panels.

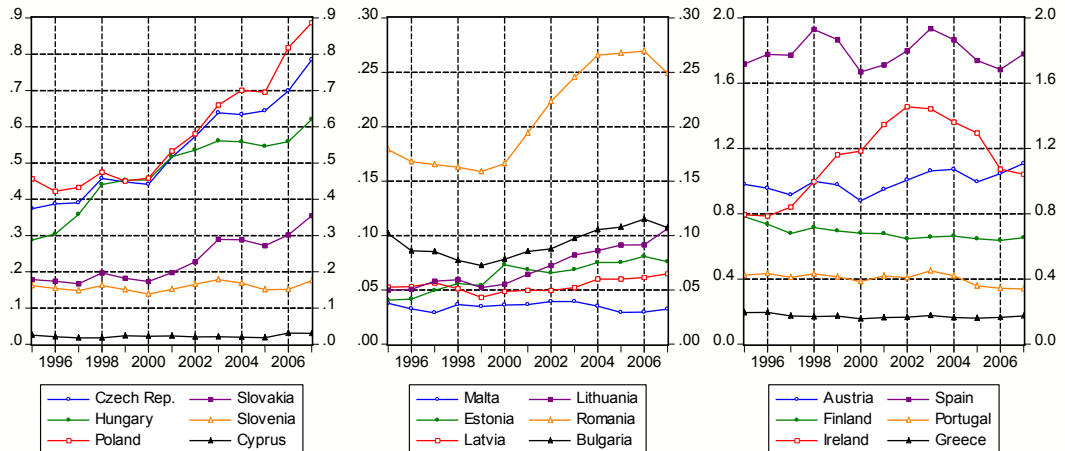
Table 8, Gross external debt (percent of GDP), 2000-2006

		2000	2001	2002	2003	2004	2005	2006
Bulgaria	total						66.9	84.9
	public						19.6	15.5
	private						47.3	69.4
Cyprus	total		35.7	47.4	51.6	64.2	74.4	81.5
	public			13.2	15.4	19.2	17.0	14.9
	private			34.2	36.2	45.0	57.4	66.6
Czech Rep.	total	38.1	36.2	35.8	38.2	41.8	37.5	41.3
	public	1.9	1.4	2.1	3.0	6.3	7.5	8.4
	private	36.2	34.8	33.7	35.2	35.5	30.0	32.8
Estonia	total	53.4	53.0	64.4	73.7	86.0	81.8	102.4
	public	3.5	2.7	3.3	3.7	3.4	2.2	2.7
	private	49.9	50.2	61.0	70.0	82.6	79.6	99.8
Hungary	total			60.6	68.8	73.6	71.0	109.5
	public			28.4	29.3	31.3	28.3	35.5
	private			32.1	39.5	42.4	42.7	73.9
Latvia	total				83.6	96.8	94.6	118.2
	public				7.5	8.7	6.3	6.1
	private				76.1	88.1	88.3	112.1
Lithuania	total				44.9	46.5	58.6	63.6
	public				14.2	13.2	12.5	13.3
	private				30.8	33.3	46.1	50.3
Poland	total	40.5	37.8	42.9	49.5	51.4	43.8	49.7
	public	19.5	15.6	18.1	20.9	22.9	20.1	20.4
	private	21.0	22.2	24.8	28.6	28.5	23.8	29.4
Romania	total	29.9	32.7	33.3	33.7	35.8	39.3	42.4
	public	18.7	19.5	18.8	18.2	16.9	14.3	11.0
	private	11.2	13.2	14.5	15.5	18.9	25.0	31.4
Slovenia	total				59.5	64.1	70.4	84.9
	public				11.1	9.6	7.4	8.5
	private				48.4	54.5	63.0	76.4
Slovakia	total				54.9	56.6	57.0	58.5
	public				16.0	16.4	11.8	14.0
	private				38.9	40.1	45.3	44.5
EA11	total				142.8	150.0	147.5	172.7
	public				35.9	38.4	36.4	39.4
	private				106.9	111.6	111.1	133.3
Austria	total				160.1	168.4	167.6	200.9
	public				52.7	58.1	55.4	61.7
	private				107.4	110.2	112.1	139.2
Finland	total			110.8	112.7	123.5	111.5	123.4
	public			40.6	43.0	44.0	33.5	33.8
	private			70.2	69.7	79.5	78.0	89.7
Greece	total				116.5	121.1	116.8	134.7
	public				83.4	85.5	79.9	87.6
	private				33.2	35.6	36.9	47.1
Ireland	total			415.4	468.3	574.2	616.9	726.2
	public			22.2	27.5	24.1	18.6	17.9
	private			393.3	440.8	550.1	598.3	708.3
Portugal	total				172.9	173.4	163.1	195.8
	public				38.6	46.0	47.1	54.4
	private				134.3	127.4	116.0	141.4
Spain	total			103.2	110.9	118.4	119.9	147.3
	public			29.7	25.0	26.4	22.4	23.2
	private			73.5	85.9	92.0	97.5	124.1

Sources: BIS-IMF-OECD-WB: Joint External Debt Hub, except Romania and Cyprus (IMF Staff report)

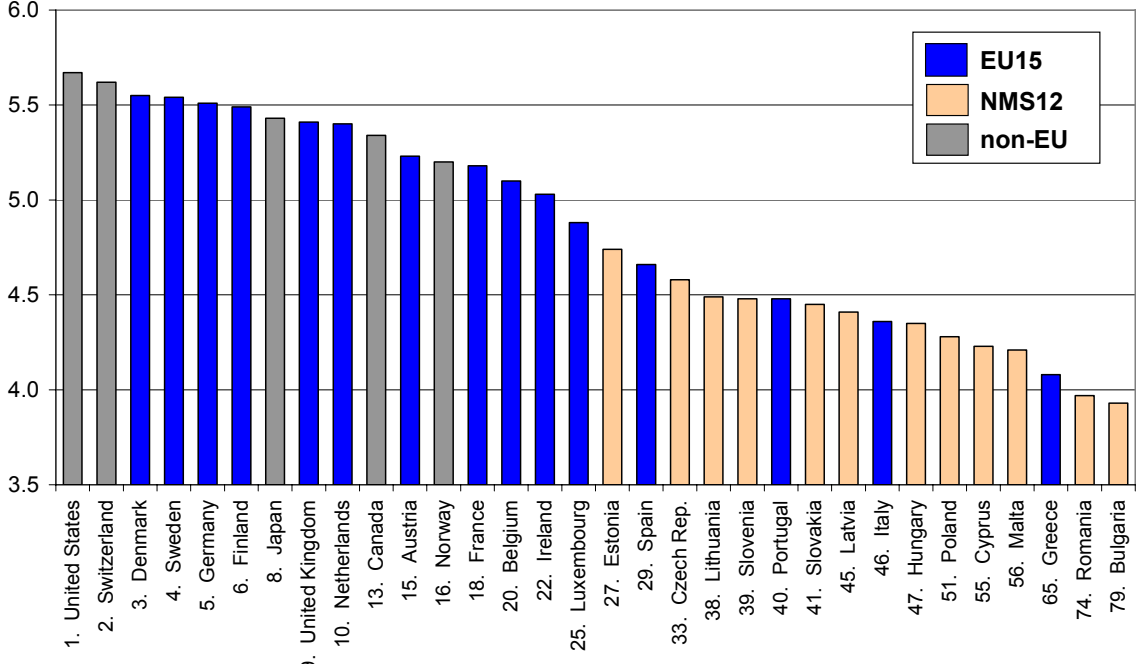
Even though the gains in productivity and the growth of exports and export market shares have been impressive in the CEEs in line with the restructuring of their economies, external competitiveness has become a cause for concern in countries where wages and unit labour cost have risen sharply in recent years and where, as a result, the real effective exchange rates have also increased considerably (*Graph 6*). Competitiveness could be an issue in Latvia, where the export market share has been stagnating in recent years (*Graph 33*) and the current account deficit has ballooned. In Romania, after very rapid growth between 2000 and 2004, the market share stagnated in 2005-2006 and actually declined in the first half of 2007. In Slovenia, the market share has been stagnating over the past decade, but Slovenia has recorded only modest current account deficits. The fact that export volume growth has been robust and export market shares have increased in most of the NMS would indicate that the main cause of the large current account deficits is excessive domestic demand rather than any significant loss of competitiveness.

Graph 33, Export market shares in total imports of the world (in percent), 1995-2007



Source: IMF: Direction of Trade Statistics. Note: 2007 values refer to January-July 2007.

Graph 34, The Global Competitiveness Index, 2007-2008



Source: World Economic Forum: The Global Competitiveness Report 2007-2008.
 Note: Numbers in front of the country names indicate the ranking among 131 countries of the world. The worst ranked country, Chad, has a score of 2.78.

Looking at competitiveness at a more general level, the Baltic countries rank reasonably well on the Global Competitiveness Index of the World Economic Forum (*Graph 34*). Among the twelve NMS, Estonia ranks the best, Lithuania is the third, and even with its sixth position among NMS, Latvia ranks above, for example, Hungary and Poland. The two least developed NMS in terms of GDP per capita, Romania and Bulgaria are the weakest performers among NMS regarding this index. However, all the NMS have still a long way to go to catch up with the most developed EU members.

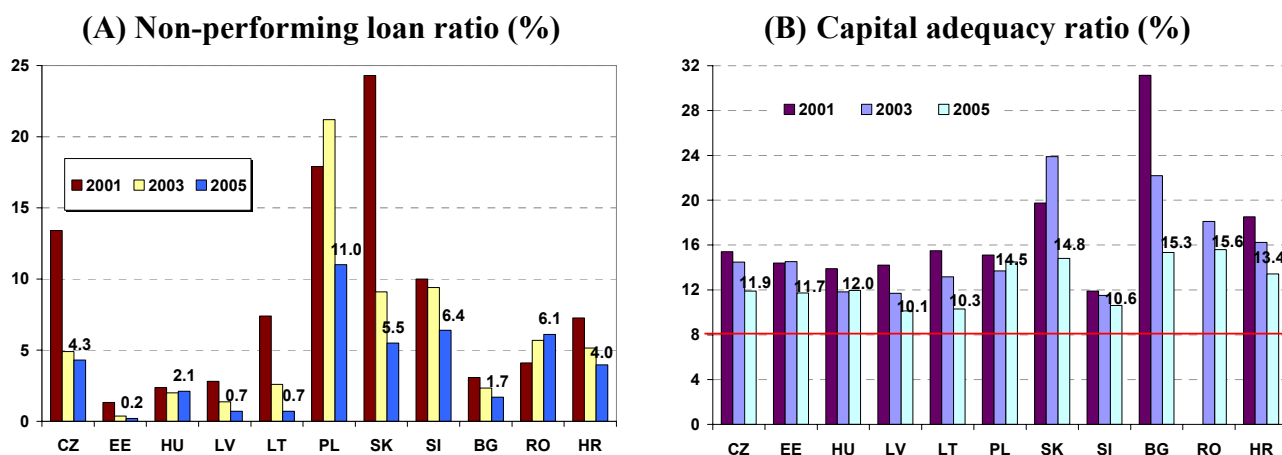
It is not known at what level of current account deficit foreign capital will retrench in the current environment of weakening but still relatively high risk appetite and euro area entry expectation. Such high deficits clearly increase the exposure of countries to capital flow reversal. Should there be a capital flow reversal, output growth will fall and income expectations will decline. This can lead to a sudden increase in non performing loans which can eventually bring about banking crises. EU membership and euro area entry prospects have so far provided a protective shield, allowing countries to finance current account deficits of a size that would have not been possible without such shield. Surely there are limits to the indulgence of the markets. The recent increase in the interest rate spreads of Latvia is a warning sign that membership in ERMII is no assurance against a turn around in the markets' assessment of the sustainability of a country's external financial position. A most immediate risk would be if markets came to the conclusion that Latvia, or any other country running a large current account deficit, will have to postpone euro area entry into a very distant and uncertain date in the future, because it can not bring its overheated economy under control.

Financial crises have often been preceded by rapid credit growth to the private sector, strong real effective exchange rate appreciation and large current account deficits. This was the case in Finland and Sweden preceding the 1992 crisis and in several East Asian countries (Malaysia, Thailand) preceding the 1997 crisis (World Bank, 2007). Preceding the 2002 crisis in Argentina, the rapid growth of credit took place in the government rather than in the private sector.

The banking sectors in the NMS are in a relatively healthy position currently: the non-performing loans (NPL) are low, the capital adequacy ratios are relatively high (*Graph 35*) and ownership of local banks by internationally renowned foreign banks is considerable (*Table 6*). However, none of these is insurance against a crisis occurring. The low level of NPLs today does not mean that the current loan portfolio will not worsen in the future, particularly in view of the large share of foreign currency loans. If there is a reversal of capital, borrowers in foreign currency will face higher payment obligations due to a depreciation of the domestic currency. While companies producing for exports have a natural hedge, firms producing for the domestic market and households do not possess such safety net. Local currency borrowers will also face higher payment obligations due to a rise in interest rates. In the household sector, defaults on mortgage loans could occur and consumption would be negatively affected. Through balance sheet effects, banks would tighten credit, further impacting negatively growth.

For this scenario to happen, the depreciation of the exchange rate would have to be significant and durable, an event that can not be altogether excluded if there was a shift in global market sentiment. If many defaults occurred, the stability of the banking system could ultimately be affected. Capital adequacy ratios could fast deteriorate if there were a significant growth in NPLs and there is no guarantee that the foreign mother banks will want to inject additional capital, especially if they themselves face difficulties back home, such as many do now in the wake of the sub-prime debacle.

Graph 35, Non-performing loans and capital adequacy ratios in the banking sector



Note: For Hungary and Bulgaria, the first bar refers to 2002.

Source: Charts 25 and 28 from World Bank (2007), "Credit Expansion in Emerging Europe: A Cause for Concern?", Regular Economic Report, Part II: Special Topic, January.

All these militate in favour of raising in the growth of credit and reducing the excessive current account deficits before it is too late. At the same time, the bank regulatory and supervisory structures should be strengthened as much as possible. The NMS have made great progress in this area over the years, but experience shows that the vigilance is never enough. In particular, the cooperation between home and host country supervision should be improved and strengthened for which the EU framework provides good opportunity.

3.3. Foreign currency loans: how to deal with them?

The problem of foreign currency loans which circumvent the domestic monetary policy and contribute to the credit booms, as well as create currency miss matches in a number of NMS, is an important enough issue to deserve special attention. Several old and new EU members have applied administrative and regulatory measures to slow down the growth of credit and to limit unhedged foreign currency loans. World Bank (2007) provides a list of such measures introduced. Administrative measures may include limits on the growth of foreign currency loans or on the ratio of such loans to the banks' own capital. Regulatory measures typically aim at raising the cost of borrowing by imposing tighter rules on foreign currency loans. These may include special reserve requirements and lower interest rate paid on those reserves, tighter provisioning and assets qualification rules, stricter non-price requirements (e.g., higher down payment, additional collateral), higher capital requirement or other measures applied to foreign currency borrowings.

The problem with such measures is that if they are maintained for a long time, they distort markets and weaken competition. Furthermore, they can be evaded by switching from domestic to direct borrowing from abroad, a technique made easier in countries where foreign owned banks play a dominant role. They can also reroute financing from bank to non-bank channels, such as leasing, and can encourage foreign banks to switch from subsidiaries to branches, a channel less supervised by the local authorities. On the whole, the effectiveness of such measures is questionable in the long run and can best serve as a short term expedient to

slow excessive credit expansion when the economy overheats. The authorities may also use moral suasion on banks, although its effectiveness is uncertain.

There are other ways that can slow down the growth of household mortgage credit which are less distorting overall because they would be specifically aimed at this fast expanding market in the NMS. The most effective would be a tax on interest payment on mortgage credit and a comprehensive real estate tax on housing, which could be reinforced by a mandatory reduction in the loan to value ratio. Where they exist, the tax deduction on the interest paid on mortgage debt should be eliminated. Such measures have been successfully used in Denmark to slow down a consumption boom in 1986 (World Bank, 2007).

3.4. Fiscal policy: not a full substitute to deal with the monetary policy shock

In view of the loss of monetary policy autonomy in the new members under fixed exchange rate arrangement and the constraints on monetary policy independence in the countries operating under floating rate regimes, fiscal policy plays a key role as a stabilizing policy during the run-up to euro and thereafter. There is no uniform yardstick of what the level of budget deficits should be in the new members. From a strictly analytical point of view, it is fundamentally a question of debt sustainability. In this respect, the Maastricht reference value of 60% of GDP can not be regarded as a useful guide. The optimal level of debt depends on, among other things, whether the interest payments crowd out other worthwhile investments and whether the disincentive effects of higher distortionary taxes to finance these payments are important or not (Aiyagari and McGrattan, 1998). From that perspective, the new members with very low debt would have more room for manoeuvre. In addition, as catching up economies, the new members have a higher potential growth rate, which implies that to maintain the long-run stability of public finances, the NMS with very low debt could run higher deficits. Assessing the sustainability of the debt requires also taking into account future contingent liabilities due to ageing. On the other hand, the benefits of the intergenerational distribution of tax burden to finance expenditures benefiting future generations are also a consideration to take into account.

From a short- to medium-term policy perspective, however, these long term analytical considerations will have to take a back seat in circumstances where fiscal policy needs to be in a position to counteract the demand pressures emanating from the interest rate shock. The appropriate fiscal stance will depend on the intensity of inflationary pressures and the degree of overheating. Experience has shown that countries which joined the euro area with deficits close to 3% of GDP lost the necessary room for manoeuvre and became subject to the Excessive Deficit Procedure (EDP). The new members might have to aim at smaller deficits than the Maastricht reference value of 3% of GDP – or to aim for a surplus - to secure the needed flexibility to cool overheating, irrespective of when they want to adopt the euro.

The low level of debt and the convergence of yields already taken place imply that the NMS with fiscal deficits can rely only to a limited extent on the automatic gains from the reduction in interest rates in the years ahead. The potential gains from yield convergence are further limited by the fact that in some of the NMS, a large portion of the government debt is in foreign currencies. For the high debt and/or high deficit NMS, we estimate these gains to be 0.6% of GDP for Poland and 2% for Hungary using the 2006 debt and interest rate levels. As a comparison, the gains represented as much as 2.4% to 5% of GDP in half of the old members five years prior to euro adoption, due to their generally higher debt and the slower

yield convergence.²⁵ This means that most of the reduction in the deficit will have to come from the primary balance in the new members.

Reducing the primary deficits presents special challenges for the CEEs. As incomes rise, public sector wages and the demand for certain publicly provided services, such as education and infrastructure services, increase so that low income countries need extra room to accommodate these higher expenditures during the catching-up process. Additionally, for the years ahead, public investment in infrastructure will need to be maintained at a relatively high level in the CEEs, given their low stock of public capital. Transfers from the EU will alleviate the burden, but in the initial years of EU membership, the net budgetary impact is limited or could be even negative.²⁶

The quality of the fiscal consolidation matters, because owing to their impact on income distribution and incentives, taxes and expenditures affect output differently. There is empirical evidence that consolidation relying on expenditure cuts rather than on tax increases are likely to last longer and are thus more successful.²⁷ Von Hagen, Hallett and Strauch (2001) showed that countries relying predominantly on expenditure cuts to consolidate their budgets during the run-up to euro achieved more lasting deficit reductions than countries using increased tax ratios.

Improvements in the budgetary procedures can contribute to fiscal discipline. The forecasting, implementing, accounting and monitoring practices vary from one country to another. Deficiencies in these areas can lead to forecasting errors and ex-post revisions which make enforcement difficult and will undermine credibility. As European Commission (2006a) points out, it is easy to overestimate revenue during booms, resulting in inadvertent pro-cyclical fiscal policy during a period which should be used to consolidate the budget. The EDP and the SGP define the fiscal rules in the EU budgetary policy framework. Adopting national fiscal rules and setting up independent fiscal councils to monitor the implementation of budgets could be important complements to the rules and monitoring procedures of the EU.²⁸

One must be realistic, however, about the extent to which fiscal policy can be used to counteract inflationary pressures due to excessive credit expansion and price level convergence. Lags in the impact of fiscal measures,²⁹ the difficulty of assessing the right timing of policy intervention, the irreversibility of some actions and the reluctance of politicians to cut back on discretionary public spending all inhibit the effectiveness of fiscal policy as a tool to cool overheating. Furthermore, because of the import leakage, large fiscal contractions would be needed in small open economies to get a significant impact on output or inflation. The situation is compounded in the CEEs by the fact that despite higher output volatilities, the cyclical sensitivity of the budgets is lower in the CEEs than in the EU15 (European Commission, 2006b). This is because of the smaller share of cycle sensitive direct taxes and unemployment expenditures. The low share of direct taxes is due in part to tax

²⁵ See Orbán and Szapáry (2004). In the old members, some of the gains referred to above come from the reduction in debt; for the sake of comparability, Orbán and Szapáry assumed unchanged debt for all countries.

²⁶ Several authors have estimated the net direct budgetary impact of EU accession and they all come up with a negative impact during the first years of membership. See Antczak (2003), Kopits and Székely (2004) and IMF (2004). Orbán and Szapáry (2004) discuss these findings.

²⁷ See Alesina and Perotti (1995, 1977), Perotti and al (1997) Buti and Sapir (1998), von Hagen, Hallett and Strauch (2001).

²⁸ Kopits and Symansky (1998) and Kopits (2001) discuss fiscal rules. For a discussion of fiscal councils, see Wyplosz (2002).

²⁹ Deroose, Langedijk and Roeger (2004) find that counter-cyclical budgetary policy actually disrupts the adjustment process when the policy lag is 4 quarters.

holidays and the low level of corporate taxes which have been used to attract FDI. The relatively large share of the black economy and tax evasion are contributing factors. The smaller share of expenditures on unemployment is generally due to the less generous benefits. This means that these countries would have to rely on even more discretionary changes to affect output and inflation. The same situation will apply after euro area entry, increasing the burden on other policies as discussed below.

3.5. Incomes policy: should be part of the arsenal

The factors limiting the use of fiscal policy as a counter-cyclical policy tool heighten the role of other instruments to control inflation, namely incomes policy. Wage developments have to be supportive of the goal of price stability and consistent with the gains in productivity in order to maintain competitiveness. If real wage growth exceeds productivity gains and a devaluation of the nominal exchange rate is no more a policy option, the resulting rise in unit labour costs and loss of competitiveness will entail a painful adjustment period. In this regard, a particularly relevant issue for the new members is the finding documented in European Commission (2006a) that when GDP growth is above potential, the increase in relative unit labour costs is not compensated by a decline of similar magnitude in the unit labour cost when GDP is below potential. This asymmetry means that to cool an overheated economy, a greater slowdown in output growth is needed to bring about adjustment, or that the adjustment will be delayed. Which outcome materializes will depend on the policy makers' preferences, but both outcomes are costly in terms of growth and employment and it is unclear which one is more so.

As discussed earlier, unionization and centralized wage bargaining is weak in the new members. It is not clear which institutional setting, centralized or decentralized, is more conducive to keep wages in line with the gains in productivity. There are successful and less successful experiences in both settings. If trade unions are mindful of the dangers of loss of competitiveness and its impact on growth and employment, centralized wage bargaining may result in greater wage discipline. If, on the other hand, the unions strive to maximize short term gains without much regard to long term sustainability, decentralized wage setting might be a better arrangement. In any event, a social dialogue between actors of wage bargaining founded on a common understanding of the role of wage policy in contributing to price stability and the maintenance of competitiveness would seem to be a key ingredient of macroeconomic management in the run-up to euro and after euro adoption.

There are examples of social "pacts" or social "consensus" which have worked well. A good example is Austria where the social consensus has been an important pillar of the hard currency policy adopted in the early 1970s. Many other countries have resorted with more or less success to such pacts in the run-up to euro (Boeri, 2005). One should not underestimate, though, the difficulty of reaching such common understandings in the NMS, taking into account the heightened expectations for "wage convergence" and "fair wages" accompanying the integration into the EU.³⁰ What is certain is that governments have a leading role to play in promoting wage moderation by clearly communicating to the public the costs of excessive

³⁰ Schnabl (2007) argues that fixed exchange rate regimes provide a stable welfare enhancing framework for wage adjustment during the economic catch-up process, because trade unions and firms have to predict solely the future productivity gains which tend to be less volatile than exchange rates. The wage bargaining process would thus be constrained by the fixed exchange rate and the requirement to maintain competitiveness. While such constraints have worked in some countries (e.g. Austria), that they would also work in the short- to medium term in the new CEEs is unclear given the pressures for "wage convergence" toward EU levels.

wage increases and by signalling through their own public sector wage policy the importance they attach to wage moderation. There have been also examples where the Government has traded tax cuts or specific labour market policy measure against wage restraint, for example in Finland and Ireland (European Commission, 2006a). This can be a helpful device on occasion, but can not be relied upon in a sustained manner. The best solution would be to forge social consensus around the goal of entering the euro area that could pave the way for a lasting practice after adoption of the euro.

3.6. Structural policies: flanking instruments

Structural reforms are essential in many NMS for achieving lasting fiscal consolidation. Perhaps the most important challenge stems from the aging of the population in the CEEs. While the current dependency ratios are somewhat lower in the CEEs than in the old members, the fertility rates are lower. With the increase in life expectancy due to the rise in incomes and better health care services, the dependency ratios are projected to increase to levels exceeding those in the old members (see Orbán and Szapáry, 2004). The aging of the population increases both the spending on health care services and the pension related contingent liabilities. How countries respond to these challenges largely determines how successful they will be in keeping the budget deficits in check.

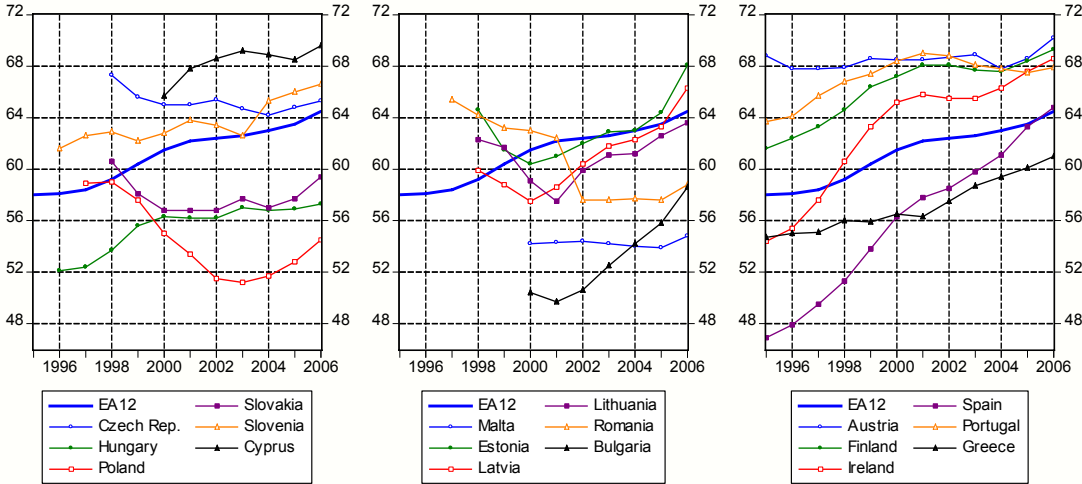
In the pension systems, reforms can take a combination of different actions: the introduction of funded pension schemes, an increase in the retirement age, a reduction of the replacement ratio and a change in indexation. Several of the new members have already initiated such reforms. When the funded schemes rely on private pension funds outside of the Government, the budgetary receipts will be reduced in the short-to medium term and the benefits to the budget will accrue only in the long term. This makes it even more important to find savings elsewhere in the budget. Measures also have to be taken to reduce the abuse of the early retirement schemes, whereby people take early retirement and continue to work afterwards in the black economy.

The quality of health care is typically poor in the former socialist countries and since it is provided basically free of charge or at very low cost to the patient, there is over consumption of health services. Health care expenditure is one of the big ticket items in the government budgets and with the rise in life expectancy and the advent of new, more expensive technology and pharmaceutical products, the burden on the budgets is rising. To improve the quality of health care services while at the same time keeping the expenditures under control, changes are needed in the system. What makes health care reform especially difficult to implement is that there is no cook book to go by, as there are many different systems in use in the developed world, each with its particular weaknesses. As a result, it is hard to muster the political and social consensus necessary for the success of such an important reform affecting the life of an entire population. Examples of these difficulties are the heated political debates in Hungary and Slovakia about the reform steps taken, threatening a reversal of the measures.

It is common wisdom that labour market flexibility improves the ability to adjust to shocks. Tighter EPL is generally regarded as hindering adjustment. As seen earlier, EPLs tend to be lower in the CEEs than in the euro area, but demands for greater protection could emerge in the new members, owing to the demonstration effect coming from old members with higher EPLs. Governments would be well advised to resist such demands. In those new members where the tax wedge is high, governments should definitely take steps to reduce it,

since it negatively affects the demand for labour and provides a powerful incentive to the flourishing of the black economy. Actions that discourage the black economy help to increase the supply of labour in the formal economy and increase the tax base. The black economy is only one of the reasons for the generally low employment rates in the NMS (*Graph 36*). More spending on active labour market policies and an increase in the retirement age would also help to increase the supply of labour.

Graph 36, Employment rate for 15-64 years old (in per cent), 1995-2006



Source: Eurostat.

Product market flexibility increases the benefits of labour market flexibility and wage moderation. Downward stickiness of prices may result in employment loss in case of a negative demand shock or higher mark ups in case of a positive supply shock. Greater competition in the product markets reduces price stickiness and makes it easier to absorb shocks through changes in relative prices. As seen earlier, some of the new members have relatively restricted product markets. The specific measures needed to strengthen competition vary according to countries. Conway, Janod and Nicoletti (2005) identifies the main areas where regulation is high in the Visegrád countries and where improvements should be made. These are different state controls and barriers to entrepreneurship and investment.

One area where several new members lag behind is the ease of doing business. According to the 2007 World Bank’s table of the ease of doing business, the Baltic States and Slovakia do reasonably well, their ranking ranging from 17 for Estonia to 32 for Slovakia on a list of 178 countries. The rankings of the other new members, by contrast, range from 45 for Hungary to 76 for Poland. A reduction of bureaucracy, an easing of regulations and the stepping up of the fight against corruption would go a long way toward improving the climate for doing business. European Commission (2007) examines the reasons for the slower productivity growth in Europe compared to the United States and discusses the measures necessary to improve productivity, such as knowledge building through more and better investment in R&D and human capital, better and more cost efficient education, and increased competition.

There are many other areas where reforms may be needed, such as the provision and financing of education, the downsizing of public employment or measures to reduce the losses of and the budgetary subsidies granted to state enterprises. What reforms are needed and how they should be implemented vary according to countries and there is no uniform recipe.

The experience is mixed whether the incentives to undertake structural reforms are stronger during the run-up to euro or in the euro area. European Commission (2006a) finds, for instance, little hard evidence that participation in the euro area has increased the resolve to implement labour market reforms. The expectation that greater competitive pressure within the euro area will speed up reforms in the labour and product markets has not materialized. On the other hand, an argument can be made that the incentives for reforms are greater during the preparation for euro adoption in view of the requirement to consolidate the public finances and to control inflation.

It does not seem to be indispensable to start, let alone finish all the necessary structural reforms prior to euro adoption, since these reforms take many years to be implemented. However, a country preparing for euro adoption should at least have a clear agenda of reforms and display a strong commitment to carry them out. Reforms in the pension and health care systems need the broad support of the society and mustering such support might be easier prior to entering the euro area if there is support in the society in favour of euro adoption. On the other hand, if there is strong resistance to such reforms, pushing them as a requirement for euro adoption might trigger a backlash against the euro. Each country will have to work out its own approach to reforms in light of its circumstances. It is advisable to at least initiate some of the most important reforms needed prior to euro adoption because once in the euro area, the political will to reform may falter.

3.7. Lessons to learn from the experiences of some current euro area members

There are lessons to learn from the experiences of the euro area peripheral countries of Ireland, Portugal and Spain, which have faced developments similar to those confronted by the NMS today. In those countries, too, the initial high level of domestic interest rates fell to euro level in the run-up to the monetary union and real interest rates collapsed, becoming negative in several of them. Credit for housing and consumption surged, unit labour costs rose and the current account deficits widened. These developments, which started before euro adoption, are still posing challenging adjustment problems for these countries, proving the persistence of the effects of the interest rate shock and credit booms when monetary policy independence is surrendered.³¹

The experience of Portugal is, in particular, worth mentioning, because the country has had limited success in adjusting to the interest rate shock. In the second part of the 1990s, Portugal enjoyed robust growth as the decline in domestic interest rates and the optimistic business climate created by the expected adoption of the euro combined to boost consumption and investment. Fiscal policy, rather than counterbalancing the growth of credit, was expansionary, as it did not retrench sufficiently in these “good times”. Competitiveness was eroded by inflation and several years of wage increases well in excess of productivity gains, leading to a widening of the current account deficit and a slowdown in output growth, averaging less than 1% per year since 2000. Investment then collapsed both because of a weakening of growth prospects and an excessive debt overhang created in the private sector during the boom years. The rate of unemployment has doubled to 8%. Portugal is now facing a lengthy and painful adjustment period.

As European Commission (2006a) documents it, the main channel of adjustment to country specific shocks, such as the fall in risk premia and real interest rate and the

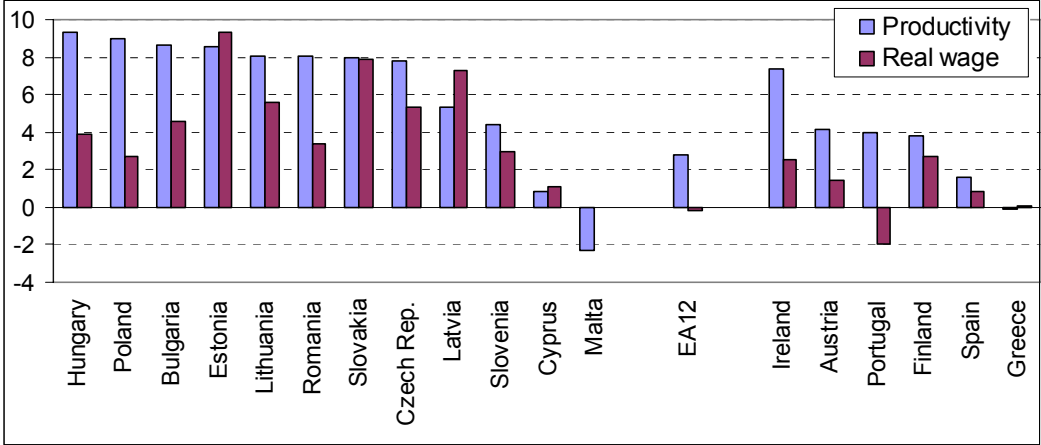
³¹ The adjustment experiences of Ireland, Portugal and Spain are analyzed in detail in European Commission (2006a). The experience of Portugal is also analyzed in Blanchard (2006).

consequent rapid expansion of domestic demand, is the competitiveness channel in a monetary union. It works this way: when inflation accelerates and wage awards exceed productivity increases, competitiveness deteriorates. The consequent shift in the supply of tradable goods and net exports reduces growth and rebalances the cyclical divergence. Regaining subsequently the lost competitiveness via price and wage disinflation is a slow process. The key is growth of productivity to improve competitiveness which has been modest or negative in Portugal, contributing to the poor growth performance since 2000.

In Spain, productivity gains have been also modest, but wage inflation has been subdued and fiscal consolidation has helped to moderate the demand pressures coming from the decline in interest rates. As a result, Spain has posted a better growth performance than Portugal. In Ireland, despite rapid wage increases, very substantial productivity improvements have contributed to a robust GDP growth. In recent years, however, Ireland has experienced a significant rise in unit labour costs and a slowdown in growth, foreshadowing the need for a period of adjustment during the years to come.

The main lesson of these experiences for the new members is that in order to cope with the effects of the interest rate shock, countries must follow fiscal policies that can counter balance the credit expansion and ought to find ways of reining in wage inflation. Productivity improvement is a key condition to maintain competitiveness and to ensure that the process of catching-up goes on. The new members have recorded robust growth of productivity as a result of the market oriented reforms (*Graph 37*). For continued improvement, a climate favourable to investment has to be maintained. The efficiency with which they can handle these challenges in the run-up to euro will have a bearing on how well they can deal with them after euro adoption.

Graph 37, Real wages and productivity in manufacturing (average annual growth in per cent), 2001-2007



Source: Authors' calculation based on data from Eurostat.
 Note: Nominal wages were deflated by the manufacturing PPI. Productivity was calculated by dividing real output by hours worked in manufacturing. Industrial production was used for Malta. Countries are ordered (within both groups) according to their productivity growth.

4. Strategies and Timing for Euro Adoption

The strategy and timing for euro adoption has to be assessed from two perspectives: (i) what does it take to meet the Maastricht nominal convergence criteria, and (ii) whether the convergence process can be better managed inside or outside of the euro area. This has to be then weighed against the well known benefits of being a member of the monetary union.

4.1. Choice of monetary-cum-exchange rate policy: which way is better?

The globalization and integration of financial markets, together with euro area entry expectations, have fundamentally altered the environment in which the catching-up process has to be managed and in which monetary policy can be operated in the new members. This is largely an unprecedented situation. In the initially less developed Western European countries, the catching-up proceeded over the years in a less globalized world and a more progressive liberalization of capital movements, without the impetus to capital flows fed by the anticipation of an early entry into a monetary union. This has provided vastly more room for pursuing an independent monetary and exchange rate policy, even as efforts were made to eliminate exchange rate fluctuations by various arrangements (snake, EMS).

This is not to say that capital liberalization and financial integration have not brought substantial benefits to the new members. On the contrary, liberalization and euro area entry prospects have greatly enhanced the inflow of FDI and have rendered the functioning of the financial systems of the CEEs more efficient, improving and speeding up the catching-up process. At the same time however, these new conditions expose the CEEs to challenges which, although not unknown from experience, are in their magnitude quite different from those faced by the old members.

A key issue is how best to tackle the inflationary pressures stemming from the combined impact of price level convergence associated with the catching-up process and the strong boost to domestic demand due to the financial integration-cum-interest rate shock. A hard peg exchange regime such as a currency board arrangement can shield against speculative exchange rate fluctuations and provide a more stable environment for small open economies, although the recent experience of Latvia is a warning sign that this is not necessarily the case even within ERMII. But as long as the peg is credible and there is little or no exchange risk premia, the low domestic interest rates heighten the danger of credit booms and overheating. Since countries with hard pegs do not have the possibility of letting the nominal exchange rate appreciate to moderate inflation, the price level convergence associated with the catching-up process translates into higher domestic inflation, which pushes the real interest rates down into very low or negative level, further fuelling credit expansion and domestic demand.

The inflation targeting regime with floating exchange rates provides more flexibility to deal with the inflationary pressures, as the risk premia can give some room for manoeuvre and there is the possibility of letting the nominal exchange rate appreciate. The flexibility should not be overestimated. As seen, the risk premia might be small due to euro area entry anticipation driven capital inflows and expectations of exchange rate appreciation. Furthermore, the tightness of domestic monetary policy can be circumvented by the foreign currency loan and the direct external borrowing channels as discussed earlier. Letting the exchange rate appreciate to fight inflation might in any case only give a temporary respite if the credit boom persists. Once within the euro area, appreciation is not available any more

and if the underlying inflationary pressures have not been brought under control, inflation will raise its head again.

It is therefore a complex question to decide which regime is best suited now to deal with the challenges on the road to the euro. The lines are already pretty much drawn it seems, with some countries having opted for hard pegs, while others have chosen a flexible exchange rate arrangement under inflation targeting.

As just said, the advantage of inflation targeting with floating rate is that it gives one extra instrument to deal with the inflationary pressures or to cope with some other unexpected asymmetric shock. The risks of capital inflow reversal should be small if the inflation targeters follow stability oriented policies which will take them into the euro area at a relatively early date. On the other hand, the risk of capital flow reversal remains significant if strong capital inflows driven by interest rate differential places undue upward pressure on the exchange rate. For instance, in Romania, where the current account deficit exceeds 10% of GDP, the capital inflows have strongly appreciated the nominal exchange rate, rendering the country vulnerable to capital flow reversal. In Hungary, when macroeconomic imbalances emerged because of inappropriate policies, the sudden outflow of capital led to a sharp depreciation of the exchange rate and an increase in interest rate spreads in 2003 and 2006.

Among the inflation targeters, the Czech Republic has been quite successful so far in maintaining high growth, modest inflation and low current account deficit, although inflation has picked up recently. Part of the success may lie in the fact that following the exchange rate crisis in 1997 and the subsequent recession, inflation expectations got anchored at a low level. The appreciation of the nominal exchange rate, which has been driven mostly by FDI inflows since the interest rate spread is negative, has also helped to keep the level of inflation low. The growth of credit has been moderate despite the low level of interest rates. However, the Czech Republic is also among those countries where both the CPI and the ULC based real exchange rate have appreciated considerably. In this country, the initial level of prices was low compared to its level of per capita GDP, so that the strong appreciation of the real exchange rate can be regarded in part as a "correction" of the initial discrepancy. Nevertheless, if the rapid trend appreciation persists, it can undermine competitiveness. In Poland and Slovakia, the real exchange rates have also appreciated considerably. In the latter country both growth and inflation are somewhat higher, while in both countries the current account deficit is larger than in the Czech Republic.

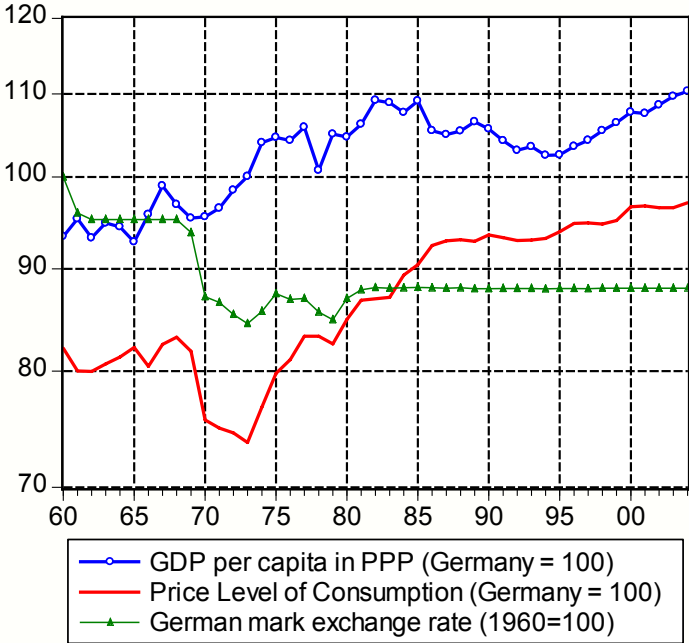
On the whole, these three inflation targeters have managed to record high growth, while keeping inflation and the current account deficit under reasonable control. It remains to be seen if these achievements can be preserved.

It may turn out to be a paradox of history that four out of the five new members with the lowest initial per capita GDP, i.e., the Baltic countries and Bulgaria, which started out with the largest price level gaps to close and the lowest financial depth and hence the greatest potential for credit booms, have opted for a fixed exchange rate arrangements on the road to euro. These countries do not have the freedom of letting the nominal exchange rate appreciate to moderate inflation and have to manage the price convergence with higher inflation. This is a difficult task when the price gap to close is large, because it feeds inflation expectations and can lead to rapid loss of competitiveness.

Price level convergence can nevertheless be successfully managed with fixed exchange rate under certain circumstances. The hard currency policy adopted in Austria in the early 1970s, whereby the schilling was fixed to the German mark, is a good example (see

Hochreiter and Tavlas, 2004). However, the price level gap to close was only about 25% in Austria (Graph 38), not 60% or more as the initial gap or the roughly 40% gap still to be closed in most of the CEEs. The key to success in Austria was a social pact that kept wage growth more or less in line with productivity gains and a fiscal policy that was supportive of the hard peg. It is also true that Austria's task was facilitated by the fact that capital liberalization proceeded more progressively than in the CEEs and it did therefore not experience the kind of capital inflows that is feeding the credit booms in some of the CEEs today. Also, Austria's banking system was more regulated than those in the present day CEEs.

Graph 38, Catching-up of Austria to Germany, 1960-2004



Source: Penn World Tables.
 Note: downward movement in the exchange rate indicates nominal depreciation.

What conclusions can be drawn from the above discussion regarding the monetary framework best suited to manage the real and nominal convergence on the road to the euro? The most important one in our view is that inflation targeters seem to have a better set of tools at their disposal than peggers to manage the convergence process on an equilibrium path toward euro adoption. The main risk for the targeters is excessive exchange rate fluctuations, but if policies are geared to macroeconomic stability, the likelihood of this happening is reduced. The more likely danger then is rather excessive appreciation of the nominal exchange rate, which can force a country into costly intervention or a lowering of domestic interest rate that can fuel credit expansion.

For the peggers, the options are limited. Exiting from the hard peg before euro adoption carries the danger of a loss of confidence and a depreciation of the currency, which could create a deep recession via negative wealth effects on the debt of households and firms in countries where the debt is highly euroized as in the Baltic States. If the exit is well communicated as a transitional step toward earlier euro adoption, the recession might not occur or would be mild, after which the country would become better positioned to control inflation. The danger here is that the nominal exchange rate appreciation could overshoot and lead to a loss of competitiveness, or exacerbate an already weak competitive position.

Therefore, the risks of exiting from the hard peg should be carefully weighted before contemplating such action. A well timed and well prepared step revaluation of the peg could be an other option to consider if competitiveness is not at stake. The risks here are the positive wealth effects on the euroized debt which would boost demand precisely at a time when the current accounts are already very large in these countries.

4.2. Maastricht criteria: are they suitable for the new members?

In order to adopt the euro, countries must satisfy the Maastricht criteria on inflation, interest rate, public debt, fiscal deficit and exchange rate stability. The logic of this set of nominal convergence criteria can be described as follows. In order to live with a common monetary policy, countries must have broadly similar inflation rates. A candidate country must therefore demonstrate before adopting the euro that its inflation rate is not excessively out of line with the rest of the euro area members. The long-term interest rate criterion serves as a means to assess the sustainability of the low inflation rate. The two fiscal criteria are to prevent free riding and spill-over effects and to ensure that a country will not have to resort to distortionary taxes to service a high debt level which would set back growth. The exchange rate stability criterion can be looked at as a “catch all” test, demonstrating that a country can live with exchange rate stability. This is of course only possible if a country follows stability oriented fiscal and monetary policies. These Maastricht criteria are therefore not a mere test to pass or “fee” to pay in order to gain admission to euro area, but should be regarded as an acceptance of stability oriented policy preferences.

Table 9, Fulfilment of Maastricht criteria (latest available data)

Harmonised Indices of Consumer Prices		Long term government bond yields		General government surplus (+) or deficit (-)		General government gross debt	
December 2007: 12-month average rate of change		December 2007		2007 (EC economic forecast autumn 2007)		2007 (EC economic forecast autumn 2007)	
Average of three lowest EU member		Average of three lowest EU member		Reference value		Reference value	
	1.3		4.28		-3.0		60.0
Reference value	2.8	Reference value	6.28				
Malta	0.70	Euro area	4.36	Estonia	3.0	Estonia	2.8
Slovakia	1.90	Slovenia	4.55	Bulgaria	3.0	Latvia	10.2
Euro area	2.10	Cyprus	4.60	Latvia	0.9	Romania	12.5
Cyprus	2.20	Slovakia	4.61	Slovenia	-0.7	Lithuania	17.7
Poland	2.60	Czech Republic	4.65	Euro area	-0.8	Bulgaria	19.3
<i>Czech Republic</i>	<i>3.00</i>	Malta	4.81	Lithuania	-0.9	Slovenia	25.6
<i>Slovenia</i>	<i>3.80</i>	Lithuania	4.94	Cyprus	-1.0	Czech Republic	30.2
<i>Romania</i>	<i>4.90</i>	Bulgaria	5.08	Malta	-1.8	Slovakia	30.8
<i>Lithuania</i>	<i>5.80</i>	Latvia	5.10	Slovakia	-2.7	Poland	46.8
<i>Estonia</i>	<i>6.70</i>	Poland	5.86	Romania	-2.7	Cyprus	60.5
<i>Bulgaria</i>	<i>7.60</i>	<i>Hungary</i>	<i>6.93</i>	Poland	-2.7	<i>Malta</i>	<i>63.1</i>
<i>Hungary</i>	<i>7.90</i>	<i>Romania</i>	<i>6.93</i>	<i>Czech Republic</i>	<i>-3.4</i>	<i>Hungary</i>	<i>66.1</i>
<i>Latvia</i>	<i>10.10</i>	Estonia	n.a.	<i>Hungary</i>	<i>-5.7</i>	Euro area	66.5

Sources: Eurostat for HICP and interest rate; EC economic forecast autumn 2007 for government balance and debt; Hungarian government balance for 2007 is the estimate of the Hungarian authorities made in January 2008. Note: Four countries, the three Baltic States and Slovakia are members of ERMII.

Table 9 shows how the new members stand vis-à-vis these criteria at the time of this writing. Regarding inflation, only in Poland and Slovakia was the rate of inflation below the reference value during the 12 months ending in December 2007. In euro area members Cyprus and Malta, the inflation was also below the reference value. In all countries except Hungary and Romania, the 10-year interest rate was below the reference rate in December 2007. The fiscal deficit exceeded the reference value in the Czech Republic (forecast) and

Hungary (estimate) in 2007. As to the government debt, only Cyprus, Hungary and Malta do not meet the relevant criterion. Four countries, the three Baltic States and Slovakia are members of ERMII.

4.2.1. Inflation criterion: why it should be modified

The inflation criterion states that the inflation rate of the country wishing to join the euro area can not exceed by more than 1.5 percentage point the average inflation of the three best performing EU Member States in terms of price stability. This criterion will prove hard to meet in the near term, especially for the Baltic countries and Bulgaria which have fixed exchange rates. Countries might be tempted to resort to techniques - such as a freezing of administered prices, a reduction of consumption taxes or a tightening of credit growth by various short term expedients - to squeeze in under the reference value. Such behaviour would be tantamount to what Szapáry (2000) labelled as the “weighing-in” syndrome: like the boxer who refrains from eating for hours prior to the weighing-in to satisfy the weight limit only to consume a big meal thereafter, the candidate country would resort to all sorts of techniques in order to squeeze in under the inflation criteria, only to shift gears after it has joined the euro area. This can turn out to be counter productive if inflation accelerates after euro adoption, due to the relaxation of credit conditions, the unavoidable upward adjustment of administered prices and/or because of a reversal of the reduction in consumption taxes for budgetary reasons. Such policy would not help the smooth path of convergence.

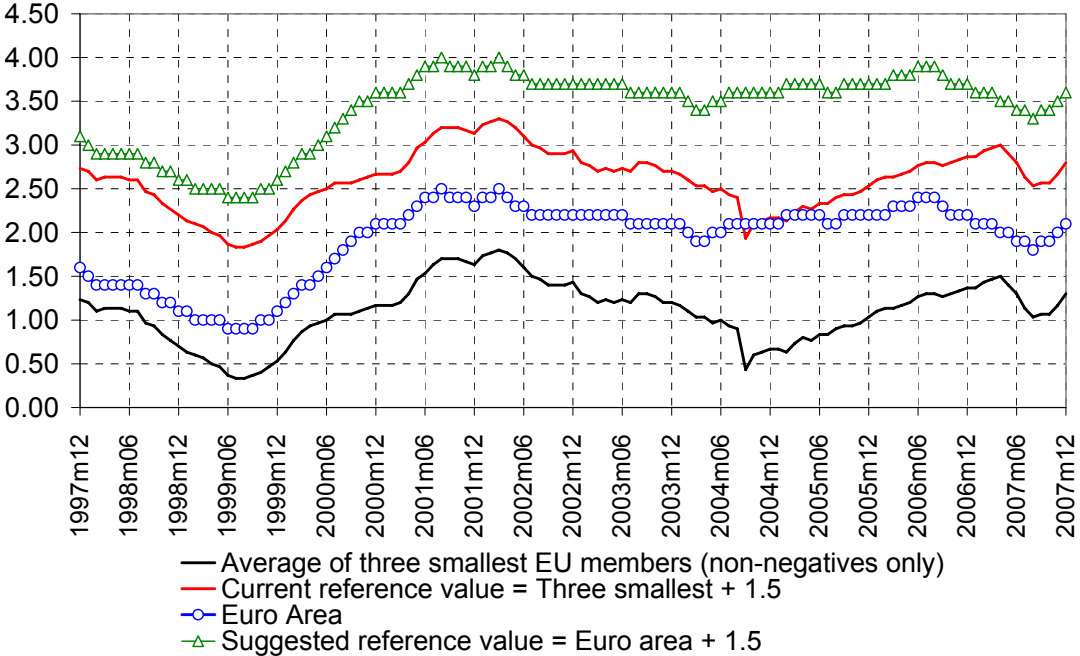
There are few options available. One is to postpone euro adoption until a greater degree of real and nominal convergence has been achieved. While this might be unavoidable for countries with the largest price level gaps and pegged exchange rate, it would deprive some others from the benefits of being a member of the monetary union. A way to ease entry into euro area for countries which already have achieved the conditions permitting them to operate normally in the monetary union would be to change the criterion. It is understandable that the inflation criterion was originally defined in terms of the three best performers among the potential candidate countries at the time when there did not yet exist a European monetary union. It was also natural that the principle of equal treatment was laid down since it would have been difficult to negotiate an agreement in any other way. Now that the euro area exists, the criterion based on the three best performers including those which are not member of the euro area is more difficult to justify on economic grounds. This is true even though it is the policy to exclude from the three best performers the countries where the low inflation level is due to special factors and is therefore judged as not sustainable (so far only countries with negative inflation have been excluded).

A reasonable solution would be to define the criterion as the euro area inflation plus 1.5 percentage points. The economic justification to use the euro area inflation is that this is the relevant indicator that contributes to the imported inflation of the new members whose trade is essentially with the euro area. Furthermore, this is the indicator that the ECB tries to control and it is not logical that the basis for the reference value for the new members should be different. The margin of 1.5 percentage points would constitute the room for accommodating the “equilibrium” forces of price level convergence. Such modification of the inflation criterion would free the decision makers from weighing which best performer country’s inflation is sustainable and which best performer’s is not, an exercise that is bound to be a source of friction. To discourage “weighing-in” practices, such modification of the reference value could be accompanied by increasing the period from one year to two years during which the inflation criterion has to be respected. It could be complemented with a

stricter interpretation of the allowable exchange rate appreciation within this period, which also corresponds to the compulsory length of stay in ERMII. Such changes would also provide a better perspective for judging whether a candidate country can maintain the low level of inflation in a sustainable way when an exchange rate appreciation is no more available for moderating inflation.

The impact on the overall inflation of the euro area of the above modification would be limited. If the euro level inflation is about 2% or less as is the target, or the average inflation is about 2.5% as were the historical highs since 1997 (*Graph 39*), a country could be admitted to the euro area with 3.5% or 4% inflation rate. The total GDP of the 12 new members represented about 8.8% of the combined GDP of the 12 old euro area members plus the 12 new members in 2007. With Cyprus, Malta and Slovenia already members of the euro area, the share of the other nine countries represents 7.6%. If in all nine countries the inflation rate would be exactly 1.5 percentage points above the euro area HICP, then this would add a mere 0.1 percentage point to the overall inflation of the euro area. This has to be compared to the effect when the current rule is applied, which is around 0.05. The impact of the proposed modification would thus be only an additional 0.05. In fact, the actual impact will be less, since the entry of countries is spread out over time and it is unlikely that all countries will have the maximum 1.5 percentage points extra inflation. The relative importance of the new members' GDP will rise with the catching-up, but the higher inflation associated with the price level convergence will also diminish. *Graph 39* illustrates the difference between the current reference value and our suggestion for modification.

Graph 39, Inflation criterion: current and suggested reference values, December 1997 - December 2007



Source: Authors' calculation based on data from Eurostat.
 Note: Values shown correspond to '12-month average rate of change' as required by the Treaty for assessing the inflation criterion.

4.2.2. Long-term interest rate criterion: not an obstacle

The criterion stipulates that the 10-year interest rate can not exceed by more than 2 percentage points the average of such interest rates in the three best performing countries in terms of price stability. This is meant to test the durability of price stability and its economic rational is clear. The only point worth making is that with euro area entry expectation driven capital inflows, the convergence of the long-term interest rates has been much stronger than the convergence of inflation. For instance, in Bulgaria, Lithuania and Romania where the inflation exceeds the reference value by wide margins, the interest rate criterion is met.

4.2.3. Exchange rate criterion: it makes sense

This criterion stipulates that a candidate country must enter ERMII for at least two years and respect the normal fluctuation bands of +/-15% without severe tensions and without devaluing against the currency of any other Member State. Countries may choose a smaller band or no band at all as a unilateral commitment. This criterion serves as a test of the ability of a country to handle shocks with exchange rate stability.

The commonly formulated criticism in respect of this criterion is that it is inconsistent to have both inflation and an exchange rate target. Theoretically this is a correct view. If the candidate country is committed to sound macroeconomic policies and it meets or is firmly on a path to meet in a sustainable manner the other Maastricht criteria, the most likely scenario is that market forces will push toward an appreciation, as was seen in a number of current euro area member countries during the run-up to euro. Some appreciation could be accommodated even with the above suggested stricter interpretation of the allowable appreciation.

The real issue concerns the choice of the ERMII central rate. Ideally, it should be set at an equilibrium level but as discussed earlier, model calculations would at best give a very wide range of the equilibrium exchange rate. The equilibrium exchange rate is a dynamic concept which changes over time, particularly in catching-up economies and, unless the misalignment is clearly unsustainable, countries are able to adjust to temporary misalignments by ways that that the equilibrium exchange rate derived from statistical models is not capable of capturing. Given these uncertainties, there are good reasons to set the ERMII central rate at the prevailing market rate. Setting it at a depreciated level compared to the market rate could jeopardize meeting the inflation target. Such step should be contemplated only if competitiveness were so weak and the current account deficit so large that devaluation was clearly needed.

Setting the central rate at a stronger level than the market rate might make sense under circumstances where competitiveness is not seen as a problem, since it can ease inflation pressures and also the pressure for appreciation beyond the central rate, if markets expect that there will be no further revaluation. The risk in this strategy is that markets may come to a different conclusion, namely that the central rate was set at an appreciated level to fight inflation and that in order to make sure that the inflation target is met, the authorities will resort to a further revaluation. This then would stimulate capital inflows and require costly sterilization. Consequently, whether setting an appreciated central rate is the right strategy will depend on where inflation and competitiveness stands at the time of ERMII entry and what are the prospects.

If reasonable macroeconomic stability has been achieved, the best bet is to set the central rate at the prevailing market rate. It is not surprising that all new members which entered ERMII have done so with a central rate set at the rate prevailing at the time of entry.

The timing of entering ERMII must be carefully chosen. A country should join ERMII only if demand management policies are on a firm path toward sustainable price stability and a large degree of nominal convergence – in inflation, interest rate and budget deficit – has already occurred. A main benefit of ERMII participation is that it can anchor inflation expectations so that the latter can work toward stability, relieving the burden on policies. For that to take place, markets have to be convinced that the fundamentals of the economy are strong and that the authorities are committed to maintain price stability.

There is also the question of the optimal length of stay in ERMII. The strongest argument in favour of not staying longer than the minimum two years required is the risk of an undue upward pressure on the exchange rate owing to inflows of convergence capital when policies are on a credible path toward euro adoption. The risks are that the markets will speculate on an appreciation of the final euro area entry rate, particularly in view of the precedents of Ireland, Greece and Slovakia where revaluations took place within ERMII. If the appreciation is excessive, it could require costly interventions as was the case for instance in Greece.

A longer stay is some times suggested on the grounds that it can serve as a discipline multiplier helping countries to learn to pursue stability oriented policies and live with exchange rate stability. However, ERM's role of anchoring expectations would only work if a country entered it with strong policies in place, which then obviates the need for a longer stay. Another argument advanced for a longer stay is that it would allow more time for the exchange rate to find its "equilibrium" level. Under the circumstances of speculative capital inflows driven by expectations of convergence or the lack of it, the prospects that the exchange rate will find its equilibrium level better by a longer stay in ERMII are not very promising. Some current ERMII members may well have to stay much longer in it because they will be unable to meet the inflation criterion as fast as they have originally anticipated. This is not a strong reason for choosing at the outset to stay in ERMII longer than required. Rather, it is an indication that the authorities may have misjudged the speed at which they could tame inflation.

4.2.4. Fiscal criteria: the rational is valid for the new members as well

According to these criteria: (i) the government debt should not exceed 60% of GDP, unless the ratio is sufficiently diminishing and approaching the reference value at a satisfactory pace; and (ii) the government budget deficit should not exceed 3% of GDP. We have discussed earlier the considerations that need to be taken into account when assessing the sustainability of the debt. The 60% of GDP debt criterion is hard to argue with. If anything, it is too high if one takes into account the contingent liabilities due to the ageing of populations. Some academics have argued that the 3% of GDP deficit criterion should be relaxed because the stock of public capital is insufficient in the new members and they need to spend more on infrastructure development (see for instance Blanchard and Giavazzi, 2004). Another argument advanced some times is that the implementation of structural reforms, such as for instance health care reform, requires to be supported with additional spending.

While it is true that the NMS need to develop their infrastructure and have to undertake structural reforms, they need the room for using the fiscal tool to counteract if necessary the overheating coming from strong credit expansion, irrespective of when they adopt the euro. Where the debt is high as in Cyprus, Malta and Hungary, they also have to worry about debt sustainability. Now that EU provides grants to help finance infrastructure investment, and given the constraints on absorptive capacities, there seems to be little justification of not meeting the fiscal criterion on the grounds of the need for infrastructural development. Moreover, as catching-up economies, the new members have higher potential growth rate and do in fact grow faster than the old members, hence the 3% criterion is less stringent for them.

4.3. Timing of euro adoption: push for early date or wait for more real convergence?

Last but not least, the question of optimal timing of euro adoption has to be addressed. The potentially most difficult nominal convergence criterion to satisfy is the inflation criterion. This is because the catching up itself means price level convergence that can be achieved by either higher inflation or exchange rate appreciation. The authorities' control in both of these areas is limited due to the unrestricted flow of capital and the associated constraints on domestic monetary policy.

Giving up the tool of exchange rate policy can present problems. If the catching-up related factors feeding inflation, i.e., the structural price level convergence and the low level of financial deepening that drives the demand for credit, are still forcefully present in an economy, the loss of the exchange rate policy can lead to boom-bust cycles and derail the smooth process of catching up, as the difficulties currently faced by Latvia to cool down an overheated economy testifies to it. This is because it seems easier to keep the appreciation of the real exchange rate inherent in the catching-up process on a more or less equilibrium path by letting the nominal exchange rate to appreciate than by keeping inflation on an equilibrium path after giving up all flexibility, however limited it is, of monetary policy independence. If an overheated economy leads to a loss of competitiveness and slow growth, it is difficult to regain it by wage and price disinflation after the surrender of monetary policy independence within the euro area, as the experience of Portugal has shown.

This is not to say that it is easy to keep the nominal exchange rate on an equilibrium appreciating path in the current conditions of free movement of capital and globalized financial markets. We have shown in the paper that for the small open economies of the CEEs, the exchange rate has been more a propagator of shocks than a shock absorber. The issue therefore evolves around a proper assessment of the pros and cons of (i) pushing for an early euro adoption and face the risks of higher inflation and the need to regain competitiveness without the disposal of the exchange rate tool, or (ii) postponing euro area membership and its benefits and facing the risks of exchange rate instability. Based on our analysis, this dilemma can be approached from the perspective of where a country is situated in the catching-up process. If the gaps to close in per capita GDP and price level are still fairly large and the speed of catching-up is fast, a country will have difficulty in controlling inflation once in the monetary union. Consequently, it might be advisable to postpone euro adoption until the gaps have narrowed.

5. Conclusions

The objective of this paper was to assess the risks and challenges facing the new members on the road to the euro and to discuss the strategies for and the timing of euro adoption. The starting level of development measured by the per capita GDP and the speed of real convergence have important bearings on the challenges faced on the road to the euro and on the strategies to be adopted. They also have a bearing on the choice of the timing of euro adoption. This is because the countries with the lowest per capita income have the largest price level gap to close. They also have the lowest initial credit to GDP ratio and hence the greatest potential for credit booms and overheating as credit converges toward its equilibrium level.

What is the optimal level of real convergence prior to joining the monetary union is hard to judge *ex ante*. To an extent, it will depend on the size of the GDP per capita and price level gaps remaining. If the gaps to close are still fairly large and the speed of catching-up is fast, a country will have difficulty in keeping inflation low once within the euro area. Consequently, it might be advisable to postpone euro adoption until the gaps have narrowed. The timing of euro adoption will also depend on how successful the country in question has been in taming the forces driving credit expansion, in implementing structural reforms that help increase productivity and the overall efficiency of the economy, and in consolidating the fiscal position in a sustainable manner.

It follows from the above that inflation targeting with floating rates is better suited than hard pegs to manage the price level convergence for *fast* catching-up economies. This is because in pegged regimes, the price level convergence associated with the catching-up process translates into higher domestic inflation, which pushes the real interest rate into very low or negative territory, fuelling credit expansion and domestic demand and adding to the inflationary pressure. Under floating exchange rate regime, the real appreciation of the exchange rate inherent in the catching-up process can be accommodated by an appreciation of the nominal exchange rate rather than solely by higher inflation.

The lines about the choice of exchange rate regime have been pretty much drawn already it seems, with the Baltic countries and Bulgaria having opted for hard peg regimes. Exiting from the hard peg could be risky because it would expose the countries to the danger of a loss of confidence and a depreciation of the currency which, via the negative wealth effect on the debt of households and firms, could push into deep recession a country where the debt is already highly euroized. If the exit is well communicated as a transitional step toward early euro adoption, the recession might not occur or would be mild, after which the country would become better positioned to control inflation. The danger in this case is an overshooting of the appreciation and loss of competitiveness. Step revaluation of the peg could be an other option down the road if competitiveness is not at stake and inflation can not be brought under control by other means. Such a step could however boost domestic demand via the positive wealth effect on the euroized debt and aggravate the imbalances in the external accounts, which are already very high in the countries with pegged exchange rates. Therefore, any change in the pegged regime should be contemplated only after careful weighing of the pros and cons of a change against accepting a delay of euro adoption.

The difficulties to manage the convergence process under inflation targeting with floating exchange rate should not be underestimated either. To keep the nominal appreciation on an equilibrium path is a challenging task, given the euro area entry expectation driven convergence capital inflows and the risk of capital flow reversal if there is a shift in market sentiment. The risks are either undue appreciation if confidence is buoyant or excessive

exchange rate fluctuations if confidence falters. We have shown that the exchange rate has been a source of shock rather than a shock absorber in the CEEs. Furthermore, the room for manoeuvre of monetary policy is constrained by such channels as foreign currency loans and direct borrowing from abroad, which circumvent the effectiveness of domestic monetary policy. These arguments would militate in favour of earlier rather than later euro adoption for countries where the degree of real convergence is more advanced.

Whether under fixed or floating exchange rate regime, the need to implement structural reforms which increase the efficiency of the economy as well as those which contribute to the long term consolidation of the fiscal accounts can not be enough emphasized. A core challenge is to secure robust productivity growth indispensable for the real convergence to proceed in a sustained way. Measures which increase the flexibility of labour and product markets and increase the ease of doing business are key ingredients of success.

Social pacts have been successfully used in some countries to keep wage growth in line with productivity gains. The new members could forge such social pacts as a policy to facilitate euro adoption, which could then form the basis of a more permanent feature of policy once inside the monetary union.

The inflation criterion as currently defined has lost its economic logic and can prevent the adoption of the euro by countries which have already satisfied the conditions permitting them to function normally within the monetary union and reap the benefits of euro area membership. We suggest that the reference value be defined as the euro level HICP plus 1.5 percentage points to accommodate the equilibrium price level convergence. This definition rests on more justifiable economic grounds and would raise somewhat the inflation permissible for euro adoption. The impact of such modification on the overall inflation rate of the euro area would be minimal. The modification of the reference value could be accompanied by increasing the period from one year to two years during which the inflation criterion has to be respected. It could be complemented with a stricter interpretation of the allowable exchange rate appreciation within this period, which also corresponds to the compulsory length of stay in ERMII. Such modifications would also provide a better perspective for judging whether a candidate country can maintain the low level of inflation in a sustainable way once monetary independence has been surrendered.

We have investigated in the paper the standing of the new members with respect to the traditional optimum currency area properties. We conclude that from the perspective of OCA criteria, the standing of the new members should not be an obstacle to the adoption of the euro. This is all the more so that empirical studies have shown that membership itself in the monetary union promotes the synchronization of business cycles and financial integration. New research has shown that the forces of endogeneity within the euro area are strengthened by the fiscal discipline embodied in the EU surveillance structure by reducing the likelihood of idiosyncratic fiscal shocks.

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7. Annex: Empirical Results from a Cross-Country Panel Regression Model of Price Level Determination

We study the key determinants of private consumption price level relative to EA12 countries with panel techniques in order to offer some perspective on possible future price level convergence. Such exercise has a close resemblance to the study of real exchange rate determination and equilibrium real exchange rate calculations.³²

7.1. The model

Our data used for estimation covers the period of 1998-2006, which we also split into three three-year long sub periods. In order to provide an initial perspective on price level convergence, *Graph 7* (see in the main text) shows the cross plot of GDP per capita and price level of consumption in 1995 and 2006. The Graph also plots the regression lines separately for NMS, for euro area members³³, and also a regression line including all countries shown.

In addition to visual evidence suggested by *Graph 7*, GDP per capita proved to be a highly statistically significant explanatory variable of the price level in all country groups and time periods. Still, the separate regression lines for the NMS and euro area members have a different level and the slope is also somewhat different, though not in a statistically significant way. When we estimate a model to include all 24 countries, the parameter of per capita GDP became closer to one (*Graph 7*) and in many cases we could not reject the null hypothesis that it is equal to one.³⁴ For this reason, we restrict the parameter of GDP per capita to one. Since there is variation around the regression line, we also study possible other determinants of the price level. We shall ask the question: what factors drive the price level away from GDP per capita when both are expressed as EA12=100? To treat all our explanatory variables similarly, we express them relative to the EA12.

We are interested in studying the possible effects of the following variables. Some of the NMS have huge current account deficits, which could be an indication of excessive domestic demand leading to overheated economies, which could also raise domestic prices. To test this hypothesis, we add domestic demand/GDP relative to that of the EA12 as an explanatory variable.

High interest rate differentials could attract interest rate sensitive capital inflows. Capital inflows could push up (i) either the nominal exchange rate (in floating regimes), leading to an increase in the real exchange rate if exchange rate pass-through is less than perfect, or (ii) the domestic price level (in all exchange rate arrangements) if capital inflows boost domestic demand. To test these effects, we include either the real or the nominal interest rate differential with respect to EA12.

³² In particular, the so called behavioural equilibrium real exchange rate (BEER) method has the same characteristic as our method; see Égert, Halpern and MacDonald (2006) for an overview.

³³ We did not include Luxembourg because it is an outlier with a 269% GDP per capita ratio and a 104% price level ratio (EA12=100), probably reflecting the high role of the financial sector. We include Denmark since it has a fixed exchange rate to the euro. UK and Sweden are not included because their relative (to EA12) price level could be affected by temporary exchange rate swings and we regard the euro area countries as anchor countries to which to catch up.

³⁴ Note that the euro area average, to which both GDP per capita and price level are compared, are a weighted average of member states, while in the regression that we run all countries are treated equally (not weighted). This explains, in addition to the exclusion of Luxembourg and the inclusion of Denmark, why the parameter estimate for euro area countries is not identical to one.

Consequently, our model includes variables that could have an effect on the price level at different time horizons. Per capita GDP is the most prominent long-run determinant of the price level. Domestic demand and the real interest rate are, on the other hand, short- and medium-term determinants. Indeed, when domestic demand is excessive, it pushes up the price level relative to EA12, but the price level corrects when demand falls back. High interest rates induce foreign demand for domestic interest-bearing assets and hence push up the price level as noted if exchange rate pass-through is less than perfect and/or if capital inflows boost demand, but these effects could disappear when yields fall back to the euro area level.

In addition to the macroeconomic variables listed above, we also include a dummy for countries having fixed exchange rate regimes (Bulgaria, Cyprus, Estonia, Latvia, Lithuania and Malta) to test whether their price level convergence have any additional elements, compared to floaters, that we have not taken into account.

That is, the model we estimate takes the following form:

$$(1) \frac{P_{t,i}}{P_{t,EMU}} = \beta_0 + \frac{\left(\frac{Y^{(PPS)}}{POP}\right)_{t,i}}{\left(\frac{Y^{(PPS)}}{POP}\right)_{t,EMU}} + \beta_1 \left(\frac{DD_{t,i}}{Y_{t,i}} - \frac{DD_{t,i}}{Y_{t,EMU}} \right) + \beta_2 (i_{t,i} - i_{t,EMU}) + \beta_3 FIXED + \varepsilon_{t,i}$$

where $P_{t,i}$ is the price level of private consumption at time t in country i , $\left(\frac{Y^{(PPS)}}{POP}\right)_{t,i}$ is per capita GDP at purchasing power standards, $DD_{t,i}/Y_{t,i}$ is the share of domestic demand in GDP at current prices; $i_{t,i}$ is the interest rate (either nominal or real depending on the specification); $FIXED$ is a time invariant dummy variable for six countries (Bulgaria, Cyprus, Estonia, Latvia, Lithuania, and Malta), and $\varepsilon_{t,i}$ is the error term. All ratios and interest rates are measured in percent.

Equation (1) could be estimated as a cross section for a single year or as a panel for more than one year. We estimated the model for 3-year long periods to increase the number of observations, which still allows studying parameter estimates in different time periods. We did not include country specific effects due to the short sample available.³⁵

We also had in mind some other variables to include in the model. One such variable was household gas prices relative to EA12, which we regarded as a proxy of administered prices. That variable, unfortunately, was not significant, though the signs of the parameter estimate were generally positive. Second, some of the NMS have popular holiday resorts and hence a high turnover of foreign tourists (most notably Cyprus and Malta). These countries tend to have higher price levels due to the demand of foreign tourists. We incorporated this effect by adding international tourism receipts/GDP minus that of the EA12. However, parameter estimates of this variable were less robust, meaning that whether it had a significantly positive effect depended on what other variables were included.

Third, domestic demand could be the consequence of rapid increase in credit. A more direct test of the effect of the level of credit could be the inclusion of credit/GDP, again, relative to EA12. However, since the level of domestic credit highly correlates with the level of per capita income, when both variables are included, domestic credit is not significant.

³⁵ Our specification is similar in characteristic to a cointegrating model in which the price level and GDP per capita are cointegrated with a known vector of [1,-1] and the domestic demand relative to EA12 and the interest rate differential have short run effects entering in the error correction specification.

When per capita income is not included but domestic credit is included, then it has a highly significant positive parameter.

Finally, we did not include net foreign assets, a popular variable used in the BEER literature, because in the surveyed literature by Égert, Halpern and MacDonald (2006) the empirical calculations had mixed signs for this variable.

7.2. Estimation results

Our key results are shown in *Table 10*. The estimated models shown differ according to whether the real or the nominal interest rate differential is included and whether a dummy variable for fixed exchange rate regimes is included.³⁶ The results indicate that, in addition to income per capita, the domestic demand and the interest rate differentials are also significant explanatory variables. In practically all specifications and time periods, the parameter of domestic demand is significantly positive and the point estimates are reasonably similar to each other and they hover around one and are never significantly different from one. This coefficient close to one implies that when domestic demand compared to GDP is larger than in the euro area by one percent, then the price level tends to be also one percent higher.

Table 10, Panel models for price level determination in NMS12

	With nominal interest rate				With real interest rate				With nominal interest rate and fixed dummy				With real interest rate and fixed dummy			
	1998-2006	1998-2000	2001-03	2004-06	1998-2006	1998-2000	2001-03	2004-06	1998-2006	1998-2000	2001-03	2004-06	1998-2006	1998-2000	2001-03	2004-06
GDP per capita	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Domestic demand se	1.22 0.18	1.46 0.57	1.51 0.31	1.02 0.18	1.26 0.19	1.69 0.59	1.57 0.31	1.39 0.22	0.91 0.21	0.88 0.58	0.98 0.26	1.00 0.21	1.06 0.21	1.32 0.68	1.26 0.31	1.45 0.25
Nominal interest rate se	0.22 0.05	0.17 0.07	0.34 0.12	0.87 0.38					0.33 0.07	0.36 0.08	0.76 0.25	0.90 0.45				
Real Interest rate se					0.33 0.31	-0.17 0.47	1.04 0.70	1.61 0.52					0.50 0.29	0.07 0.44	1.53 0.65	1.53 0.53
Fixed E.R. Regimes se									7.05 2.15	13.08 4.23	11.82 3.28	0.47 2.92	4.79 1.99	7.26 4.22	8.06 2.88	-1.55 2.55
Adjusted R-squared	0.32	0.24	0.36	0.56	0.28	0.20	0.36	0.58	0.40	0.43	0.57	0.56	0.32	0.27	0.48	0.58
No countries	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
No observations	106	34	36	36	106	36	36	36	106	34	36	36	106	34	36	36

Note: *Regressand*: price level of private consumption (EA12=100); *GDP per capita*: GDP per capita in purchasing power standards (EA12=100); *Domestic demand*: share of domestic demand in GDP minus that of the EA12 (EA12=100); *Real interest rate*: real interest rate of 3M interbank rates minus that of the EA12 (in %); *Nominal interest rate*: 3M interbank interest rate minus that of EA12; *Fixed ER regimes*: dummy for countries operating under fixed exchange rate regimes (Bulgaria, Cyprus, Estonia, Latvia, Lithuania, and Malta). Estimation with OLS; standard errors are robust to heteroskedasticity; significant (at least at 10%) parameter estimates are in bold; intercepts are included but not reported.

³⁶ We also estimated the models with time dummies included. However, the test for the null hypothesis of redundant time effects could not be rejected (the p-value was 0.40). Furthermore, the point estimates of parameters differed only slightly from the parameters shown in *Table 10*. For example, in the third specification shown in the table (nominal interest rate differential is used and the fixed exchange rate dummy is included) and when the whole 1998-2006 period is used for estimation, the three estimated parameters were 0.94, 0.38 and 7.05 (instead of 0.91, 0.33 and 7.05). For these reasons we do not include time dummies.

Results for the interest rate differential are significant in all time periods when the nominal interest rate differential is used, and is also significant in the more recent periods when the real interest rate differential is used. The magnitude of the coefficients in recent years is 0.8 (nominal interest rate differential) and 1.5 (real interest rate differential), implying that a one percent rise in the differential leads to a price level increase relative to EA12 of those magnitudes.³⁷ The significant parameter estimate of the interest rate differential indicates that interest rate sensitive capital inflows can temporarily appreciate the nominal exchange rate in excess of what would be required by price level convergence implied solely by the catching-up of GDP per capita.

Finally, the fixed exchange rate dummy is significantly positive only for 1998-2000 and 2001-2003, but not for 2004-2006. This indicates that the six countries operating under fixed exchange rate regimes had higher price levels up to 2003 (compared to their GDP per capita level and to the other two factors included in the model), but in more recent years their price levels relative to these three variables are not significantly higher than those of the floaters.

To sum up, in addition to the level of GDP per capita at PPS, the level of domestic demand per GDP (relative to EA12) and the interest rate differential are significant explanatory variables of the price level relative to EA12 and these variables are robust to various alterations in model specification. The six NMS with fixed exchange rate regimes do not differ in the more recent period of 2004-2006, that is, they do not have any more a higher price level than floaters relative to per capita income. This reflects the fact that the peggers had a faster price level convergence in the earlier period. However, if the peg contributed to excess domestic demand growth, for instance via lower real interest rates (see Section 3.2 of the paper for discussion of the mechanisms), then of course the peg itself had an (indirect) effect on price level increases and inflation, since the parameter of domestic demand is found to be significantly positive.

7.3. Price level convergence prospects

We use the estimated model for the full 1998-2006 period to offer some quantitative prospects of future price level convergence and its effect on inflation. To this end, we assume various catching-up scenarios in terms of GDP per capita, and assume that domestic demand and the interest rate converge to EA12 levels as the catching-up process levels out. When selecting the “long run” values of the variables, we draw on experience from the EA12 countries.

Our calculations are only illustrative. We do not consider factors of production (productivity, capital, labour), saving, and the external constraints of growth, that is, whether external debt remains at a manageable level or explodes due to high current account deficits.³⁸ These factors are left out of consideration partly because of data constraints (lack of capital stock) and partly because our primary goal is the study of the inflationary consequences of catching-up, irrespective of what factors contributed to the process. We assume that catching-up, that is, excess growth of GDP compared to EA12, is fast when a country has a much lower per capita GDP than the EA12, but the speed decreases with the advance of the catching-up process. Such behaviour could be conveniently modelled with a logistic function:

³⁷ Égert, Halpern and MacDonald (2006) in a survey article report that BEER estimations tend to find a positive impact of real interest rate differential on the real exchange rate.

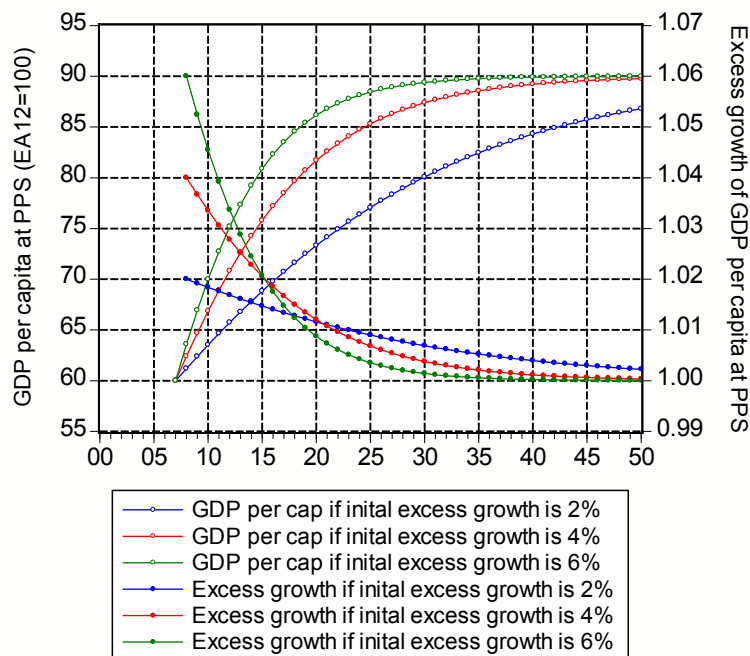
³⁸ Darvas and Simon (2000) present a detailed model in which they consider these and further factors and study the possible catching-up paths of Hungary.

$$(2) \quad \frac{\left(\frac{Y^{(PPS)}}{POP}\right)_{t,i}}{\left(\frac{Y^{(PPS)}}{POP}\right)_{t,EMU}} = \frac{1}{\alpha + \beta \exp(-\gamma \cdot t)}$$

where α , β and γ are parameters. One can calibrate these three parameters so that equation (2) matches (a) per capita GDP in 2007 relative to EA12, (b) per capita GDP in the long run relative to EA12, and (c) the initial speed of catching-up, that is, the excess growth of per capita GDP of country i over per capita GDP growth of EA12.

Graph 40 illustrates the catching-up process assuming that the initial level of per capita GDP is 60 and its long run level is 90 (EA12=100). The three scenarios shown on the Graph differ according to the initial excess growth assumed: 2%, 4% and 6% per year.

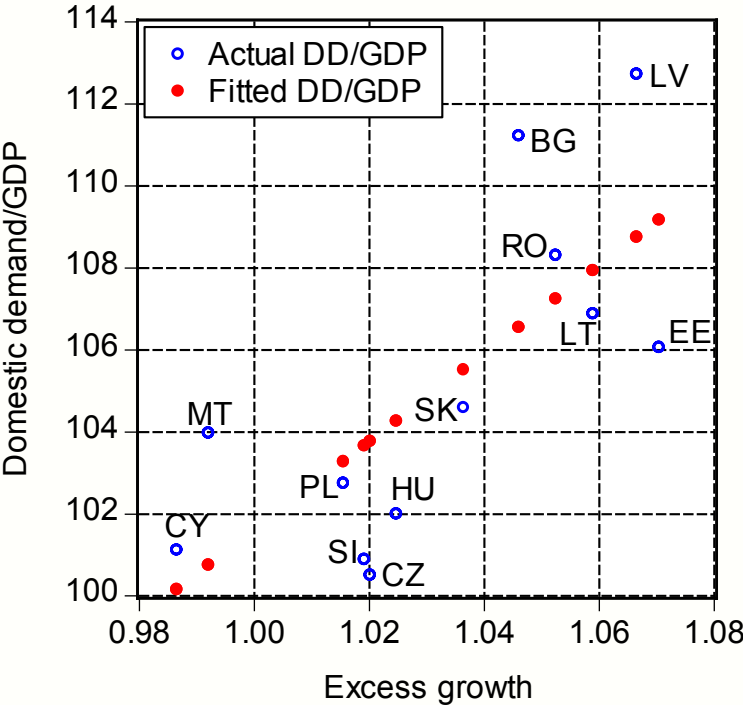
Graph 40, Hypothetical catching-up scenarios, if initial GDP per capita equals to 60 and its long-run level is 90 (EA12=100), as a function of initial excess GDP growth over EA12, 2007-2050



Source: Authors' calculation. Per capita GDP at PPS is shown on the left axis; one plus excess growth is shown on the right axis (i.e. a 4% growth is indicated as 1.04).

Another factor we take into account is the relationship between the speed of catching-up and domestic demand/GDP. *Graph 41* shows that there is a positive relationship between these two variables.

Graph 41, Excess growth of GDP per capita and the level of domestic demand/GDP in NMS12



Note: Excess growth was calculated for 2000-2007; domestic demand/GDP is average for 2000-2006. Empty circles show actual values for the 12 NMS, while filled circles show the fitted values from a bivariate regression.

We calibrate the parameters of the model (separately for each NMS) using the following assumptions:

Long run level of per capita GDP: as a benchmark, we assume that the NMS will catch up in the long run to either 90 percent or 100 percent of EA12 per capita GDP measured at PPS. The 90 value roughly corresponds to the average GDP per capita of the three peripheral EA12 countries, Greece, Portugal and Spain. However, since Cyprus and Slovenia were above the 90 percent level by 2007, we show only the full catching-up results for these two countries.

Initial level of per capita GDP: the initial level is made equal to actual values in 2007.

Initial speed of catching-up: the excess growth of per capita GDP at PPS is set equal to actual excess growth in 2000-2007. The average growth during this 8-year long period could well proxy the potential growth rate. Cyprus and Malta experienced a negative excess growth over this period (see Table 11), but a positive initial growth is needed for the model to converge, therefore, we assumed that the initial excess growth rate is 0.5%.

Table 11, Excess growth of per capita GDP at PPS over EA12 growth in 2000-2007 (in percent)

Bulgaria	Cyprus	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Romania	Slovenia	Slovakia
4.6	-1.3	2.0	7.0	2.5	6.7	5.9	-0.8	1.6	5.2	1.9	3.6

Note: Values shown correspond to annualized average growth of GDP/capita at PPS relative to EA12. Average GDP growth of EA12 was 2.0 percent per year in 2000-2007.

Domestic demand/GDP: There is a significant empirical relationship between excess growth and domestic demand per GDP (*Graph 41*). Consequently, as growth slows down, domestic demand per GDP is expected to fall. In order to incorporate this effect, the initial level of domestic demand per GDP is set equal to the actual value in 2007 and its convergence toward the equilibrium level depends on the catching-up according to the regression line shown in *Graph 41*. However, since the model describes the relationship with error, in order to avoid a jump from the actual value in 2007 to the fitted value in 2008, we assume that there is a partial adjustment toward the fitted value with an adjustment coefficient of 0.9.

Nominal interest rate differential: the interest rate differentials were generally tiny in 2007 and will be zero when the country joins the euro area. For simplicity, we assumed that the interest rate differential will be zero by 2015 and declines (increases in the case of the Czech Republic) linearly in time till then. For Cyprus, Malta and Slovenia the interest rate differential is zero since their euro area entry.

Graphs 42 and 43 show the results of the benchmark catching-up scenario. *Graph 42* displays GDP per capita relative to EA12 and its growth rate. The initial level of development and the initial excess growth have a strong impact on the speed of projected convergence. For example, the least developed country, Bulgaria, had a GDP per capita of 38.7 percent in 2007 and the average excess growth in 2000-2007 was 4.6 percent. According to our benchmark projection, on the basis of these assumptions it will not reach the steady state level of 90 percent even in 2050. Consequently, its excess inflation will be lower. In contrast, Estonia, which had a relatively high per capita GDP in 2007 (71.7) and a fast excess growth (7.0%) in 2000-2007, is projected to catch up very rapidly.

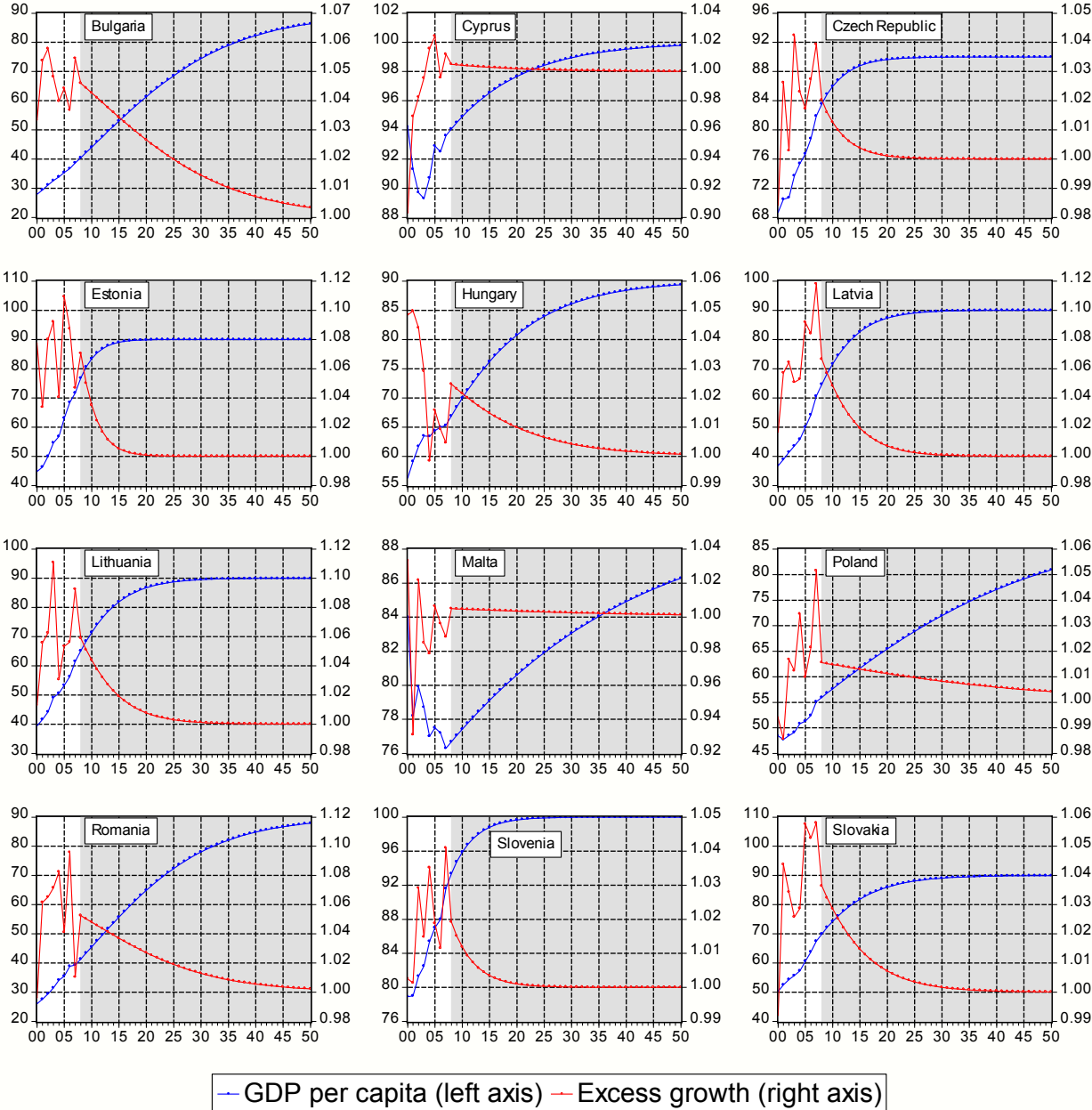
Graph 43 shows the corresponding domestic demand/GDP and interest rate differential projections. Parallel with the slowdown in the rate of catching-up, domestic demand converges toward GDP and its convergence speed depends on its initial value in 2007 and the projected excess growth rates shown in *Graph 42*. The Graph also reveals that the interest rate differentials were generally tiny in 2007, with the exception of Latvia, Hungary and Romania.

Our results for the inflationary consequences of the price level convergence are shown in *Table 12*. The table shows annual average excess growth of the price level relative to the euro area, hence, either domestic inflation should be larger than in the euro area with the magnitudes shown in the table, or the nominal exchange rates should appreciate by the indicated magnitudes, or a combination of these two factors should occur.³⁹

The table indicates that two of the three most developed countries already in the euro area, Cyprus and Malta, do not face significant inflationary risks. The third country, Slovenia, is projected to have 1.6 percentage points higher annual inflation than the euro area in 2008-2012 if its GDP/capita would catch-up to 100% of EA12, but the inflationary effect diminishes afterwards, due to levelling out of the speed of the catching-up of GDP per capita.

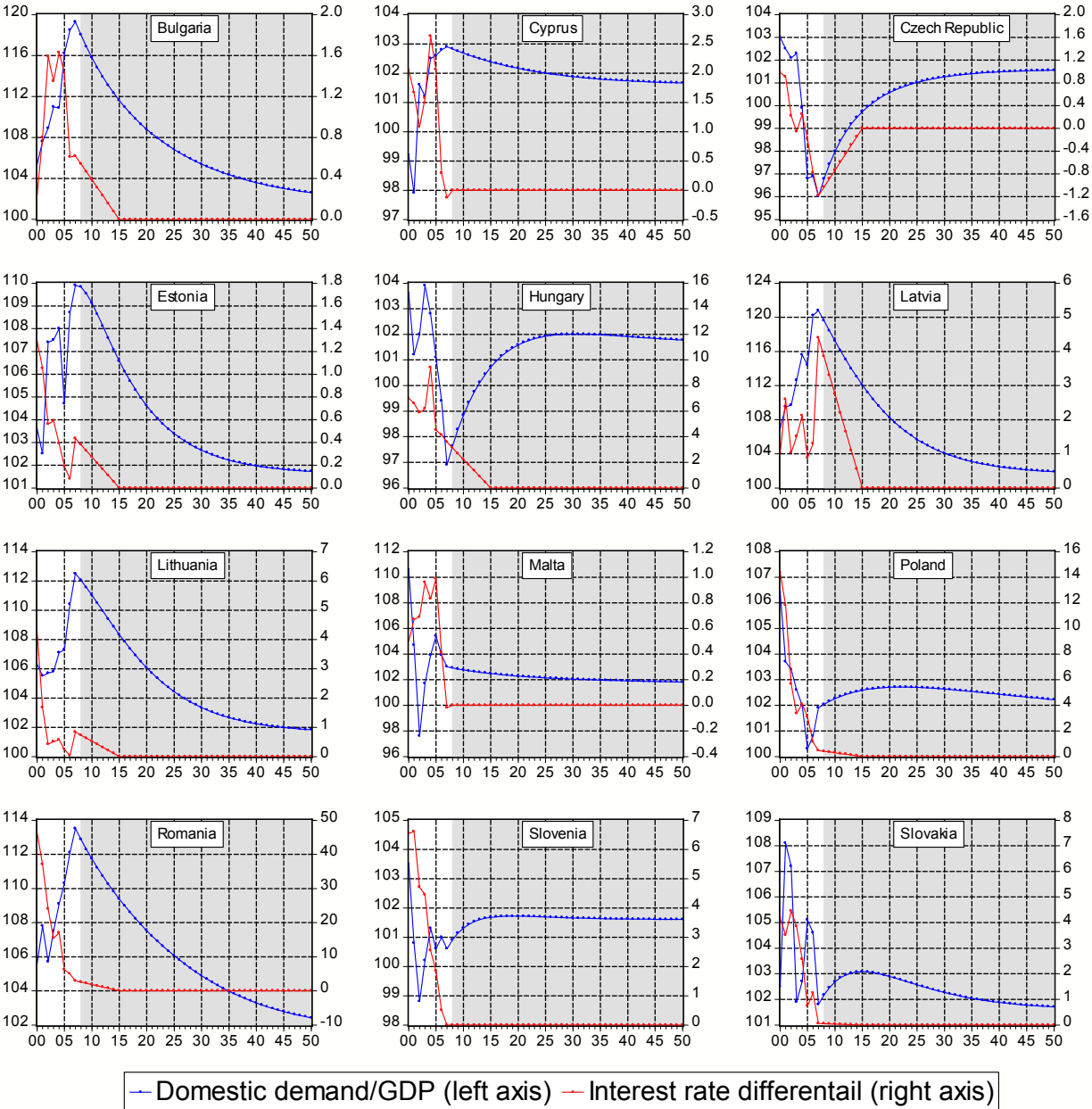
³⁹ Using actual data between 1999 and 2007, we looked at the difference between the speed of price level convergence, on the one hand, and the speed implied by domestic and EA12 inflation rates and the euro exchange rate, on the other hand. The differences between the two measures were generally tiny (i.e. in many cases between plus and minus half percent per year) and had mixed signs.

Graph 42, The benchmark catching-up scenario: GDP per capita at PPS, 2000-2050



Note: Catching-up to 90% of EA12 for all countries except Cyprus and Slovenia, for which 100% catching-up is assumed. Actual values for 2000-2007; projections for 2008-2050 are indicated with shade. One plus excess growth is shown on the right axis (i.e. a 4% growth is indicated as 1.04)

Graph 43, The benchmark catching-up scenario: domestic demand/GDP and interest rate differential, 2000-2050



Note: Actual values for 2000-2007; projections for 2008-2050 are indicated with shade.

The low value of excess inflation for Bulgaria needs some explanation. *Graph 41* shows that Bulgaria had the largest residual when regressing domestic demand/GDP on excess GDP growth, namely, the 4.6% excess growth was accompanied with a demand/GDP value of 111.5% instead of the fitted 106.5%. Since the model assumed that demand/GDP will revert to the regression line (although with a lag due to our partial adjustment assumption), the implied fall in domestic demand/GDP has a moderating effect on inflation. Without this effect (i.e. if our assumption will not hold) excess inflation in Bulgaria would be around 4.5% per annum over euro area inflation in 2008-2013.

The four floaters, the Czech Republic, Poland, Romania and Slovakia are projected to have excess inflation over euro area inflation and/or nominal exchange rate appreciation of between 1.8% and 3.6% per annum if the GDP per capita catching-up rate is 90%. A full 100% catching-up has only a tiny further effect.

The three Baltic States are projected to face an excess inflation over euro area inflation of around 3% per year during 2008-2012, though the extra inflation is projected to diminish by 2013-2017 due to the moderating effect of the slowdown in their GDP growth and consequently to the fall in the domestic demand/GDP ratios.⁴⁰

Table 12, Benchmark specification: projected annual average price level convergence

	Catching-up to 90% of EA12			Catching-up to 100% of EA12		
	2008-2012	2013-2017	2018-2022	2008-2012	2013-2017	2018-2022
Bulgaria	1.2	1.8	1.8	1.2	2.0	2.0
Cyprus	n.a.	n.a.	n.a.	0.4	0.3	0.2
Czech Republic	2.5	0.9	0.3	3.0	1.6	0.8
Estonia	3.3	0.0	-0.3	4.3	0.9	0.0
Hungary	3.2	1.9	1.3	3.3	2.2	1.6
Latvia	2.3	0.5	-0.1	2.6	1.3	0.5
Lithuania	3.4	1.2	0.3	3.8	1.9	0.9
Malta	0.4	0.4	0.3	0.4	0.4	0.4
Poland	1.8	1.5	1.3	1.9	1.6	1.4
Romania	2.7	2.6	2.2	2.8	2.8	2.5
Slovenia	n.a.	n.a.	n.a.	1.6	0.4	0.1
Slovakia	3.6	1.6	0.7	3.8	2.2	1.2

Note: The interpretation of the values shown is the following: either inflation will exceed the EA12 inflation rate by the magnitudes shown, or the nominal exchange rate should appreciate by these magnitudes, or a combination of these two factors should occur.

Various other alternative scenarios could be looked at, but our two benchmark scenarios illustrate well the price level convergence-real convergence nexus in the new member states during the years ahead. The speed of price level convergence depends critically on the assumed rate of growth of GDP and the moderation in domestic demand per GDP. The higher is the rate of growth, the faster is the price level convergence; the faster is the speed of decline in domestic demand per GDP, the lower is the price level convergence. Under fixed exchange rate conditions, this will translate into inflation differentials relative to the euro area average inflation. Under floating exchange rates, the price level convergence can be accommodated by a nominal appreciation of the exchange rate or a combination of nominal appreciation and higher inflation.

⁴⁰ Using a different framework for the analysis of the real and nominal convergence nexus, Lewis (2007) also found that inflation is likely to exceed the Maastricht reference value in the CEEs with fixed exchange rate.