

## Links between Real and Nominal Convergence in the New EU Member States: Implications for the Adoption of Euro<sup>1</sup>

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### Abstract

*This paper analyses the relationships between real and nominal convergence in the new post communist member states and on this basis evaluates the potential benefits and risks connected with joining the euro. The analysis observes both the common problems of catching-up economies and the dissimilarities and peculiarities influenced by the differences in the macroeconomic parameters in individual countries. The regression analysis shows interdependence between the comparative price and wage level and the income per capita level. The benefits connected with elimination of exchange rate risks and reduction of transaction costs are compared with the disadvantages associated with the loss of an independent monetary policy and an adjusting exchange rate mechanism. Attention is paid to a potential impact on real convergence of the observed countries.*

**Keywords:** *nominal and real convergence, currency area, comparative price and wage level, unit labour costs, exchange rate appreciation and depreciation*

**JEL Classification:** E31, F15, F43, J30, O11

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### Introduction

The new EU member states are preparing for entering the single currency area in Europe (the euro area) in accordance with respective accession treaties and convergence programmes to extend their economic integration. Determining

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the moment when the conditions are suitable for taking this step is vital in order to ensure that the stability of the single currency or continuous development of the accessing countries are not disturbed. The Maastricht criteria, which all accessing countries are required to meet prior to entering the euro area, safeguard stability of the euro. Governmental institutions in individual countries assess the conditions and determine suitable timing for adopting euro and following consultation with other euro area members also set the conversion rate to be applied to the local currency. This is a major economic decision with far-reaching consequences, which can be predicted to a certain extent based on theoretical assumptions and practical experience with functioning of the single currency (see Iša, 2005).

Analyses of governmental and EU institutions typically focus on the capacity of individual countries to meet the Maastricht convergence criteria. Many countries are forced to reconsider their original highly ambitious plans. Problems with meeting the criteria (in particular problems associated with high deficits of public budgets and higher inflation rates) lead to postponing the original deadlines set in individual convergence programs. However, the second aspect of this issue, i.e. assessing how the adoption of the single currency will influence the process of catching up with the economic level in the relevant countries and to what extent will benefit the competitiveness of these countries, also deserves attention.

Arguments frequently used in individual countries tend to be based on political reasons, as if adopting euro sooner than other new member states was a matter of prestige. When economic aspects are considered, attention is typically paid mainly to the relevant country's ability to meet the Maastricht criteria. Potential impact on real convergence of the countries involved in this process is not considered in great detail.<sup>2</sup> The assumption that the evident advantages, including especially the elimination of exchange rate risks and reduction of transaction costs, will outweigh any disadvantages associated with the loss of an independent monetary policy and an adjusting exchange rate mechanism is automatically applied. This paper aims to contribute to the ongoing discussion through examining the links between real and nominal convergence and anticipated benefits and risks. It focuses on post-communist countries in Central and Eastern Europe

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<sup>2</sup> The Czech Republic assesses its readiness for adopting the single currency once a year, in autumn, when the document *Evaluation of compliance with the Maastricht convergence criteria and the level of economic harmonization with the euro area* is produced by the government. Cyclical and structural harmonization and the functioning of other than exchange rate adjusting mechanisms (public budgets, labour market flexibility and the capacity of the financial system to absorb shocks) are evaluated. However, the evaluation does not provide an explicit answer as to whether the adoption of euro within the determined deadline will support or hinder the economic growth and thus influence the progress of catching up in the economic level.

(hereinafter only as EU-8) with a special emphasis on Central European countries excluding the Baltic States (EU-5).<sup>3</sup>

Section 1 discusses the initial income per capita level, current progress, real convergence factors and the consequent shared priorities of the monitored countries. Section 2 studies links between nominal and real convergence, assessing nominal convergence not only according to the compliance with the Maastricht criteria, but also according to the initial levels of nominal values. Section 3 analyses different conditions and specifics of individual countries influencing their individual approaches to the adoption of the single currency. The final section 4 summarizes the anticipated benefits and potential risks associated with the introduction of euro with regard to different conditions in individual countries.

## 1. Initial Level and Progress of Real Convergence

The new EU member states face certain common problems in the adoption of euro due to their status of catching-up economies. They are economically less developed countries with a robust economic growth as their priority. Economic differences between individual European Union countries after the latest waves of enlargement are greater than ever before. Gross domestic product per capita in purchasing power standard (PPS) in the lowest band of the newly accepted post-communist countries (the 6<sup>th</sup> round of EU enlargement took place in May 2004) is approximately a half of the average figure for EU-25 (specifically 51 to 55% in Poland, Latvia and Lithuania).<sup>4</sup> The level achieved in the middle band is approximately 60% (from 60 to 65% in Slovakia, Hungary and Estonia). Only two of the new member states fall into the highest band achieving more than three quarters, i.e. 76% in the Czech Republic and 84% in Slovenia. These two countries exceed the current level of the economically weakest member of the original EU-15 (Portugal) and Slovenia closely approaches the level achieved by Greece (data for 2006, see Graph 1).

Economic levels as low these did not occur in any of the previous waves of EU enlargement. Less developed economies of the former EU-15 currently classified under the so-called cohesion countries, such as Portugal, Greece and Spain had significantly higher levels at the time of their accession to the EU. In 1986,

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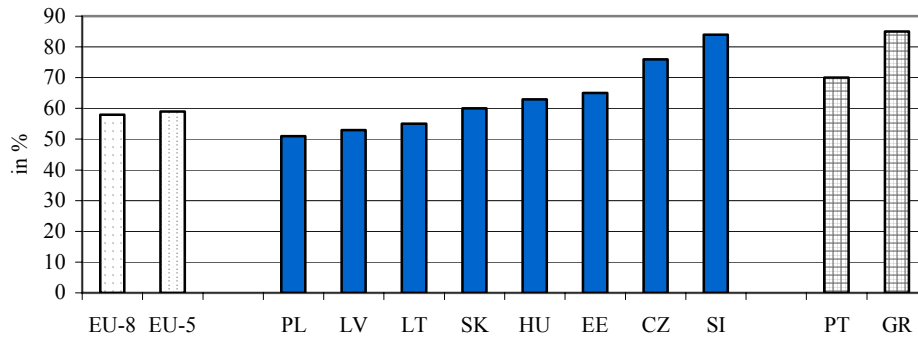
<sup>3</sup>As the new EU member states from Central and Eastern Europe have undergone transformation from economies with central planning to a market economy, they share many common characteristics with regard to the convergence process. Slovenia has certain specifics in this regard because it had stronger interconnections with western economies prior to the collapse of the former Yugoslavia and did not have very rigid central planning system.

<sup>4</sup>In Bulgaria and Romania (new entrants to the EU from January 2007 – the 7<sup>th</sup> round of EU enlargement) only 35 and 36%, respectively, in 2006.

the least developed Portugal achieved around 60% of the EU average according to GDP per capita in PPS; its income per capita level increased to 73% of EU-15 (i. e. 80% of EU-25) when the euro area was established in 1999.

Graph 1

**GDP per capita in PPS in EU-8 and Cohesion Countries, 2006 (EU-25 = 100)**



Note: EU-5, EU-8 are weighted averages.

Source: Eurostat (2007b), downloaded 5. 6. 2007.

Priorities of economically less developed countries striving to catch up with the average level in the community and undergoing fundamental structural changes differ from those of stabilized developed countries that form the core of the euro area. Catching-up dynamically developing economies have “looser” macroeconomic parameters compared to stabilized and economically developed EU economies. As they need to supplement their own resources with higher volumes of foreign savings, they often record higher deficits in the balance of payment current account. Large public investments in neglected infrastructures (co-financed by the EU) lead to higher deficits of public budgets. Most importantly, these countries typically have higher inflation rates, which facilitate faster transfer of labour and capital flows in accordance with market criteria (the Czech Republic and Lithuania represent specific exceptions in this regard).

Excessively rigid macroeconomic policies under these conditions can prevent robust economic growth and fast progress of catching-up in the economic level. A low inflation rate enforced in a catching-up economy as required by the Maastricht criteria could “smoother” the economic growth. The rapid restructuring of production taking place in these countries complicates inflation measurement. There is increased probability that a part of qualitative changes is reflected in the statistics incorrectly as a price change rather than a volume change in the economic output. Although this phenomenon also occurs in stabilized economically developed countries, its extent is significantly smaller (it is estimated at

approximately 1% per year). The incidence of this phenomenon in catching-up countries with rapid structural changes is undoubtedly significantly higher.

On the other hand, the move from conditions with high inflation rate to an environment with stable and low inflation in catching-up economies is associated with another phenomenon referred to as breaking the inflation expectations. The creation of inflation expectations by economic entities includes often very significant adaptive component, which needs to be taken into account. This is why monetary authorities need to work with an estimated growth in labour productivity, anticipated distortion in the inflation rate calculation and the required criterion. These aspects combined should produce a compromise that does not influence the rate of real or nominal convergence.

Disregarding the first half of the 90s, when the monitored transition economies experienced a period of transformation crisis, we can note that their economic level approached the EU-25 average relatively fast during the eleven-year period from the second half of the 90s to 2006. The economic level of Slovenia approached the EU level the most significantly of all EU-5 countries during this period (by 16 p.p.). High growth in the Baltic States was caused by their very low initial levels and the fact that these countries taken together shortly before the EU-entry reached the economic level corresponding to that achieved within the former USSR. Slow convergence in the Czech Republic was caused by the recession in the second half of the 90s. During 2001 – 2006, the economies of EU-4 (excluding Poland) accelerated the process of convergence, approaching the EU level by 9 – 13 p.p. (see Table 1).

Table 1  
GDP per capita Rates of Growth and Level in PPS<sup>1</sup> in the NMS-8 (1995 – 2006)

	GDP p. c. Growth Rates (in %, annual average) <sup>2</sup>		GDP p. c. in PPS (EU-25 = 100)				
	1996 – 2006	2001 – 2006	1995	2000	2006 <sup>3</sup>	Difference in p. p.	
						1995 – 2006	2000 – 2006
Czech Republic	2.9	4.1	69	65	76	7	11
Hungary	4.4	4.5	49	54	63	14	9
Poland	4.4	3.5	41	47	51	10	4
Slovakia	4.2	4.9	45	47	60	15	13
Slovenia	3.9	3.5	68	73	84	16	11
Estonia	8.2	9.1	34	42	65	31	23
Latvia	7.9	9.2	30	35	53	22	18
Lithuania	6.9	8.2	34	38	55	21	17

Notes: <sup>1</sup> PPS – purchasing power standard is an artificial currency unit on the basis of euro, which expresses the average price level in EU-25 countries. <sup>2</sup> In constant (domestic) prices. <sup>3</sup> Preliminary.

Source: Eurostat (2007a, 2007b), downloaded 4. 6. 2007; author's calculations.

However, a range of factors needs to be considered when assessing the progress of real convergence. The rate of approaching the economic level of more

developed countries does not correspond completely with the GDP growth rate differential, which does not reflect certain qualitative elements, especially the changes in terms of trade (T/T). This aspect plays an important role in small open economies. For example, T/T in the Czech Republic improved by 11% in 2005 compared to 1995, while in Slovakia and Poland deteriorated by 3 and 6% respectively (for detailed information see Vintrová, 2005).

## 2. Links between Real and Nominal Convergence

Most authors see nominal convergence simply as another term for compliance with the Maastricht criteria, which define conditions for accepting individual EU member states in the euro area.<sup>5</sup> These criteria include inflation rate, long-term interest rate, public budgets stability (determined according to an acceptable annual general government budget balance and to a level of accrued general government debt in relation to GDP), and finally exchange rate stability. These rules were originally defined for application among economies with more or less equal economic levels and almost equal growth rates. The issue of potential inconsistency with real convergence was irrelevant under the given circumstances. However, the situation in the new, less developed EU member states is different.

The Maastricht convergence criteria are based on “incremental” variables. They consider development of prices characterized by the inflation rate but not the initial comparative price level. Theoretically, harmonization of the relative price levels can never occur in the case of different initial comparative price levels and more or less equal price increase. This is in contrast to the functioning of market forces in a single market.

However, the rule “one market, one price” is primarily enforced in tradable sectors of economies involved in foreign trade. It is reflected in non-tradable sectors, especially in public services, with a certain delay through the so-called “wage infection” (the so-called Balassa-Samuelson’s effect, see e.g. Vintrová and Žďárek, 2006).

Harmonization of price levels in the countries with a flexible exchange rate occurred through two channels – the positive inflation differential and appreciation of the exchange rate. The exchange rate channel is no longer available after adopting euro. Strong inflation pressure is to be logically expected in countries with originally low inflation rates where price convergence occurred mainly through the exchange rate channel in the past. Experiences of dynamically developing

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<sup>5</sup> This definition is stated explicitly for example in Dědek (2006). Other authors define this term in a similar manner, see Dobrinsky (2006).

economies that have entered the euro area (Ireland, Portugal, Spain) confirm increased inflation rates following the foundation of the euro area in 1999 to levels between 3 and 4% during the following approximately 5 years.<sup>6</sup> Coordination policies of the EU strived to reduce the inflation pressures in these countries. Inflation was afterwards slowed down at the cost of a reduced economic growth (see Table 2).

**Table 2**  
**GDP Rate of Growth and Rate of Inflation in Ireland and Cohesion Countries before and after Adoption of Euro**

	Ireland	Portugal	Greece <sup>1</sup>	Spain
<b>GDP growth rates in constant prices</b>				
1997 – 1998 annual average	11.0	4.5	3.5	4.2
1999 – 2003 annual average	7.6	1.9	4.3	3.8
2004	4.3	1.3	4.7	3.2
2005	5.5	0.5	3.7	3.5
2006	6.0	1.3	4.3	3.9
<b>Consumer price inflation (HICP)<sup>2</sup></b>				
1997 – 1998 annual average	1.7	2.0	4.9	1.9
1999 – 2003 annual average	4.1	3.3	3.2	3.0
2004	2.3	2.5	3.0	3.1
2005	2.2	2.1	3.5	3.4
2006	2.7	3.0	3.3	3.6

Notes: <sup>1</sup>Greece entered the Eurozone 2 years later, in 2001. <sup>2</sup>Due to methodological change from January 2006, the data are available 1997 onwards. The HICP index levels were rescaled, the base is year 2005 (2005 = 100), see News Release 146/2005; own calculations.

Source: Eurostat, downloaded 5. 6. 2007.

Economic results in individual “catching-up” EU-15 countries developed differently. Ireland significantly reduced its economic growth compared to the previous period but it remains high above the EU average. Greece complied with the Maastricht criteria employing certain tricks, especially with regard to budget deficits; however, the previously lower economic growth rates improved significantly. Portugal suffered the worst consequences by reverting to divergence. While the economic level of this country measured by GDP per capita in PPS increased in relation to EU-15 from 66% in 1991 to 73% in 1999 and 2000 (i. e. to 80% in relation to EU-25), this increase was reversed during the last years. In the years 2002 – 2006 the average annual rate of growth of GDP was only around 1% (in 2003 was even negative) and the economic level in relation to EU-25 was falling. In 2006, GDP per capita in PPS reached approximately 70% of EU-25 average.<sup>7</sup>

<sup>6</sup> The inflation rate in Ireland was even up to 5% during 2000 – 2002.

<sup>7</sup> There was a break in time series in 2003, therefore the figures are not comparable with the earlier years; however, from 2003 to 2006 another decrease of 3 p.p. took place.

Although divergence of the economic level in Portugal – originally the poorest EU country – coincided with joining the euro area, the main causes of this development can be seen in the country's insufficient capacity to adjust to changes that occurred after the last EU enlargement. The competitiveness of Portugal in EU-15 was based on cheap labour.

However, labour from the new EU-8 member states is even cheaper and better qualified.<sup>8</sup> While labour costs per employee in EU-4 (excluding Slovenia) range from 26% in Slovakia to 37% in Hungary (data for 2006 in euros) of the average level in EU-27, labour costs in Portugal are higher by 2/3 compared to Hungary and the Czech Republic and nearly twice as high as in Poland or Slovakia.

What's more, the Central European countries have a better geographic position in close proximity to the centers of economically developed EU countries. Lesson we can learn from Portuguese problems is the fact that relying on cheap and low qualified labour is not advisable and should not be a decisive factor in the new EU member states, as they are under threat by the competition of even cheaper countries both, inside (Bulgaria and Romania) and outside the European Union (Ukraine, China).

The evaluation of "maturity" for adopting the single currency in catching-up economies should not be based solely on "incremental" Maastricht criteria. Nominal convergence should be interpreted as convergence in the *levels* of nominal values, i.e. especially price and wage levels. Real and nominal convergence influences each other. Countries with low economic levels have low price levels compared to more economically developed countries and their comparative wage levels are even lower. As their economic levels improve, comparative price levels increase and real appreciation of their currencies occurs together with a growth of relative wage levels compared to more advanced countries. Continuation in the economic level catching-up (based on a higher growth of labour productivity) and convergence of price and wage level is vital for smooth progress of the integration process. Less developed countries base their competitiveness on low wages and low overall production cost. While these "low cost economies" mainly make use of cost/price-based competitiveness, economically developed countries have better conditions for non-price/qualitative competitiveness.

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<sup>8</sup> Approximately three quarters of the working age population in Portugal have basic education only (according to the ISCED classification 0 – 2). On the other hand, only 11% of the population in the Czech Republic (and 13% of the population in Slovakia) falls into this lowest group. The share of population with secondary education (ISCED 3 – 4) is lower than 13% in Portugal, while the same figure is 77% in the Czech Republic and 74% in Slovakia. Shares of the population with completed tertiary education do not differ significantly and range between 12% and 13% in all countries listed above; see Kadeřábková (2005).

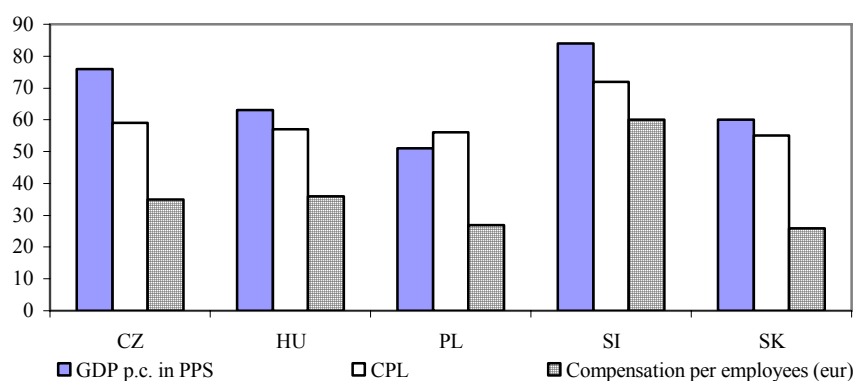


### 3. Differences in Individual Countries

#### 3.1. The Income per capita, Price and Wage Level Gaps

The gap in relation to the developed EU member states differs in individual characteristics of real and nominal convergence. Nominal convergence indicators do not always reflect differences in income per capita levels (see Graph 2).

Graph 2  
GDP per capita in PPS, Comparative Price Level (CPL)<sup>1</sup> and Wage Level<sup>2</sup> in the EU-5, 2006 (EU-25 = 100)



Notes: <sup>1</sup>CPL – comparative price level, whole economy. <sup>2</sup>Compensation per employee – gross wages plus indirect labour costs, whole economy, national account concept.

Source: Eurostat (2007a, 2007b), downloaded 5. 6. 2007; Gligorov and Podkaminer et al.(2007); own calculations.

The price levels in Hungary, Poland and Slovakia in relation to EU-25 were very close to the relation in the income per capita levels. Although a minor downward deviation of the price level from the monitored relation was detected in Slovenia, this applied with a significantly higher income per capita and price level (84% and 72% in relation to EU-25 in 2006 respectively). Any discrepancies between real and nominal convergence after adopting euro will therefore be far less significant in Slovenia than, for example, in the Czech Republic.

Economies of EU-5 countries are characterized by a high level of cost/price-based competitiveness arising from relatively low labour cost and low comparative price level (see Table 3). The average gross nominal wage in the Czech Republic was EUR 713 in 2006, i.e. just above one quarter of wages in the neighboring Austria. This level was a little above the levels in Hungary and Poland but significantly higher than in Slovakia.

Unit labour costs (ULC) measured as overall labour cost per employee<sup>9</sup> in EUR divided by GDP in PPS per employed person in the Czech Republic is around

a half of the EU-27 level and only around 40% of the level in the neighboring Austria. Among the EU-5 countries, ULC in the Czech Republic is more or less equal to that in Hungary and Poland, while ULC in Slovenia was substantially higher and ULC in Slovakia was markedly lower (see Table 4). An indicator defined in this manner demonstrates the price-based competitiveness at the national level.

**Table 3**  
**Average Gross Monthly Wages and ULC in EU-5 in Comparison with Austria, 2006**

	Average Wages (exchange rate adjusted)		Average Wages (PPS adjusted)	
	EUR	Austria = 100	Austria = 100	PPS
Czech Republic	713	26	47	1 210
Hungary	646	24	44	1 135
Poland	637	24	44	1 138
Slovakia	505	19	35	903
Slovenia	1 210	45	66	1 691
Austria	2 695	100	100	2 574

Source: Gligorov and Podkaminer et al. (2007), pp. 119 – 129; own calculations.

**Table 4**  
**Labour Productivity, Labour Costs and ULC in EU-5, 2006 (EU-27 = 100)**

	GDP per Employed Person in PPS <sup>1</sup>	Labour Costs per Employee in EUR <sup>2</sup>	Aggregate ULC <sup>3</sup>
Czech Republic	70	35	50
Hungary	75	37	49
Poland	62	28	45
Slovakia	70	26	38
Slovenia	83	61	73

Source: <sup>1</sup>Eurostat (2007b); <sup>2</sup>Eurostat (2007a), downloaded 3. 6. 2007; <sup>3</sup>own calculations.

The Czech economy is characterized by large differences between income per capita level and price and wage levels due to historical reasons arising from different initial exchange rate arrangement and a stricter monetary policy applied during the transformation period. The greatest part of this divergence can be attributed to the beginning of the transformation process, when the economy moved from eastern to western markets and exchange rate was significantly undervalued in relation to the purchasing power parity in order to maintain the country's price-based competitiveness. The exchange rate deviation index (ERDI), which measures a deviation of the exchange rate from the purchasing power parity, was 3.5 on average in 1990 in the former Czechoslovakia, while the same figure in Hungary was only 2.6 (in comparison with Austria).<sup>10</sup>

<sup>9</sup> Including social insurance contributions and other indirect cost according to compensation per employee from the national accounts statistics, exchange rate adjusted.

<sup>10</sup> The last depreciation of CSK took place in December 1990 and therefore could not be reflected fully in the average figures; over the following years ERDI reached values ranging from 4 to 4.5.

The gradual increase in the comparative price level occurred through different channels. Until 1997, the nominal CZK exchange rate was fixed and the price level converged due to faster inflation compared to EU member states.<sup>11</sup> Following the monetary crisis in 1997 the exchange rate regime in the Czech Republic changed to the “managed float” and appreciation of the CZK nominal exchange rate became the main channel for convergence of the CPL. Nominal and real appreciation arose from long-term improvement in qualitative parameters, reflected also in terms of trade. In 2006, the CPL was 59% in the Czech Republic, 56% in Poland, 55% in Slovakia, 57% in Hungary and 72% in Slovenia (in relation to the average for EU-25, see Table 5).

Table 5  
Comparative Price Levels 1995 – 2006 (EU-25 = 100)

	EU-25 = 100			Difference in p. p.		
	1995	2000	2006	1995 – 2006	1995 – 2000	2000 – 2006
Czech Republic	38	46	59	21	7	13
Hungary	43	47	57	14	4	10
Poland	44	52	56	12	8	4
Slovakia	41	43	55	14	2	12
Slovenia	74	72	72	-1	-3	2
Estonia	38	53	61	23	14	8
Latvia	33	50	54	21	17	4
Lithuania	26	46	52	26	20	6
Portugal	74	74	85	11	-0	11
Greece	77	79	84	7	2	5
Spain	85	84	92	7	-1	8

Source: Eurostat (2007a), downloaded 3. 6. 2007; own calculations.

Despite the significant convergence compared to the first stages of transformation, the price level in the Czech Republic remains low in view of the country’s income per capita level. In other words, the difference between the purchasing power parity of CZK, i.e. its purchasing power on the domestic market, and the market exchange rate remains excessively large. The average annual exchange rate in 2006 was 28.34 CZK/EUR, while the purchasing power parity was 16.75 CZK/PPS. The real exchange rate appreciated in comparison with Germany by 46% between 1998 and 2006, which meant annual appreciation by 4.8% (on the basis of GDP deflators). Unlike in other transforming countries, the real appreciation was less influenced by the difference between inflation rates compared to EU economically advanced countries. Over the last seven years, annual appreciation of the CZK nominal exchange rate was approximately 3.8% compared to euro.

<sup>11</sup> The average annual inflation rate between 1993 and 2000 was 9.1% in the Czech Republic, 18.1% in Hungary and 19.5% in Poland.

The trend of appreciating nominal exchange rate in the Czech Republic is long-term and more significant than in the other new member states (exchange rates in Slovenia and Latvia depreciated over the last five years). In real terms (i.e. nominal exchange rate growth deflated by the unit labour cost index), the fastest appreciation occurred in Hungary and the Czech Republic, while real depreciation took place in Latvia and Poland (see Table 6).

Table 6

**Nominal and Real Exchange Rate Compared to EUR in EU-8**

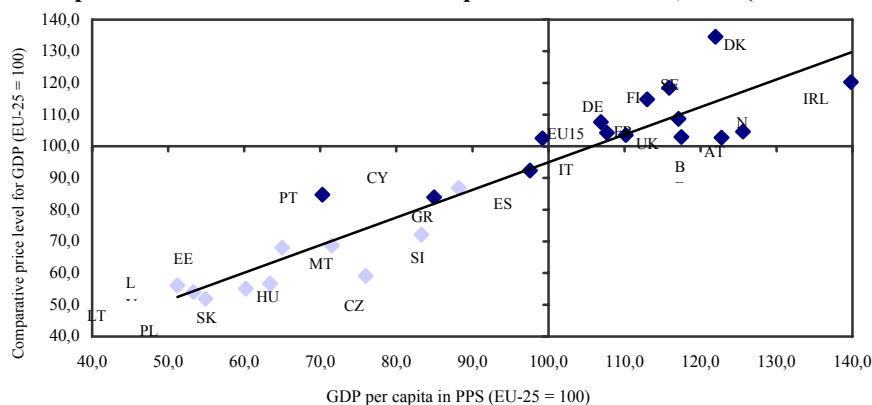
	Nominal Exchange Rate		REER <sup>1</sup>
	Average annual appreciation (+), depreciation (-) in%, 2001 – 2006	2006 (%)	Average annual appreciation (+), depreciation (-) in%, 2001 – 2006
Czech Republic	3.9	5.1	6.0
Hungary	-0.3	-6.1	5.0
Poland	0.5	3.3	0.2
Slovakia	2.3	3.7	3.9
Slovenia	-2.4	-0.0	0.9
Estonia <sup>2</sup>	0.0	0.0	2.7
Latvia	-3.6	0.0	-1.0
Lithuania <sup>2</sup>	1.1	0.0	1.4

Notes: <sup>1</sup>Real effective exchange rate, deflated by ULC in the whole economy, weights of 34 advanced countries. <sup>2</sup>Currency board.

Source: ECFIN (2007); Eurostat (2007b); own calculations.

The Czech economy needs more time to bridge the gap in the price level and the level of nominal wages, which is inconsistent with the country's income per capita level. Regression analysis of the relationship between the price level and the level of nominal wages on the one hand and the income per capita level on the other hand shows significant downward deviations.

Graph 3

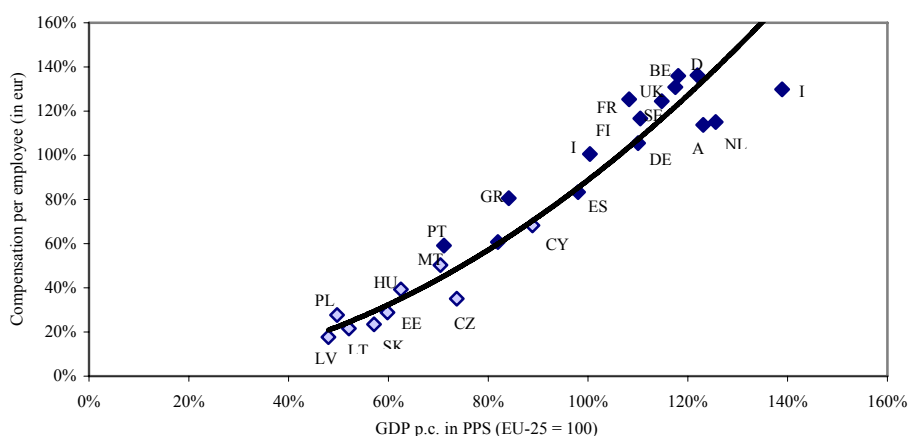
**Relationship between Economic Level and Comparative Price Level, 2006 (EU-25 = 100)**

Source: Eurostat (2007a, 2007b), downloaded 3. 6. 2007; own calculations.

The other new member states are either directly on or in close proximity to the regression curve, which means that their lower price and wage levels are more or less consistent with their lower income per capita levels (see Graphs 3 and 4).

Graph 4

**Relationship between Economic Level and Labour Costs Level,<sup>1</sup> 2005 (EU-25 = 100)**



Notes: <sup>1</sup>Average annual labour costs (including social contributions and other indirect costs) per employee in EUR in relation to EU-25. Data for Luxembourg are excluded. The regression equation is  $LC \text{ p.e.} = 0.8878 (\text{GDP p.c.})^{1.9739}$ .

Source: Eurostat (2007a, 2007b), downloaded 1. 3. 2007; own calculations.

### 3.2. Inflation Rate, Public Budget Deficits and Balance of Current Account

The development in EU-8 countries has so far been characterized by dynamic real convergence associated with relatively high inflation rates, which significantly exceeded the average figure for the EU throughout the transformation period. The Czech Republic and the Lithuania have been an exception in this regard, as their inflation rates were even lower than the euro area average during 2001 – 2006. Continuously high inflation rates persisted in Hungary, Slovakia and Slovenia, and no significant decrease in the inflation rate occurred in Latvia (see Table 7). Poland, which was characterized by a high inflation rate at the beginning of the transformation period, experienced rapid disinflation during the current decade. In 2005 the inflation rate decreased to the average level for the euro area and in 2006 even below this level. There is a discussion as to how much the policy of the Polish central bank that persevered to maintain relatively high interest rates in order to decrease the inflation rate contributed to the slowdown of the economic growth in 2003 – 2005.<sup>12</sup> Slovakia had equally high interest rates as Poland, although with a significantly higher inflation rate. The highest inflation rates over the last six years in EU-5 were recorded in countries with

the most dynamic economic growth, i.e. Slovakia and Hungary. The Czech Republic is somewhat exceptional in this respect as it accelerated its economic growth, while keeping a low inflation rate.

Table 7

**Consumer Price Inflation in the EU-8 and Euro Area in 1997 – 2006**

	Rate of Inflation (annually average in %) <sup>1,2</sup>		
	1997 – 2006	1997 – 2000	2001 – 2006
Czech Republic	3.4	5.8	2.0
Hungary	8.5	13.1	5.5
Poland	5.8	11.0	2.5
Slovakia	6.9	8.8	5.6
Slovenia	6.1	7.8	5.1
Estonia	4.7	6.2	3.7
Latvia	4.4	4.2	4.5
Lithuania	2.6	4.5	1.4
Euro area	1.9	1.5	2.2

Notes: <sup>1</sup>HICP (Harmonized index of consumer prices). <sup>2</sup>Due to methodological change from January 2006, the data are available 1997 onwards. The HICP index levels were rescaled, the base is year 2005 (2005 = 100), see News Release 146/2005; own calculations.

Source: Eurostat (2007b), 5. 6. 2007.

Public budget deficits were relatively high in the past and in many countries continue to represent one of the main obstacles in meeting the Maastricht criteria. This is the case especially in Hungary (see Table 8). However, the Czech Republic may also encounter some future problems, as the original Convergence Programme is not fulfilled.

Table 8

**Balance of Public Budget and Current Account in the NMS-8 (1996 – 2006)**

	General Government Budget Balance (in % of GDP) <sup>1</sup>			Current Account Balance (in % of GDP)		
	1997 – 2000 <sup>2</sup>	2001 – 2006	2006 <sup>3</sup>	1996 – 2000	2001 – 2006	2006 <sup>3</sup>
Czech Republic	-4.1	-4.7	-2.9	-4.4	-5.2	-4.1
Hungary	-5.6	-7.1	-9.2	-8.2	-7.0	-5.9
Poland	-3.1	-4.5	-3.9	-3.8	-2.6	-2.2
Slovakia	-7.4	-4.3	-3.4	-6.8	-5.8	-7.7
Slovenia	-3.8	-2.4	-1.4	-1.2	-1.1	-2.7
Estonia	-0.2	1.8	3.8	-7.7	-10.7	-14.0
Latvia	-1.8	-1.1	0.4	-6.8	-11.5	-21.0
Lithuania	-5.3	-1.2	-0.3	-9.4	-7.0	-11.0

Notes: <sup>1</sup>EU definition: net lending (+) or net borrowing (-) according to the ESA '95, excessive deficit procedure, annual average. <sup>2</sup>Latvia and Slovenia data for year 2000. <sup>3</sup>Preliminary.

Source: Eurostat (2006a, 2007a), downloaded 15. 5. 2007.

<sup>12</sup> See for example Gligorov and Podkaminer et al. (2006).

Deficits on the current account of the balance of payment are high in the Baltic States, Hungary and Slovakia (this deficit in the Czech Republic decreased significantly in 2005). These countries may experience problems with maintaining the macroeconomic stability. Their external vulnerability relates to possible rapid fluctuations in the exchange rate. The “twin” deficit, i.e. the public budget deficit and the balance of payment current account deficit, was considerably high in Hungary in 2006 (15% of GDP). The high current account deficit in Hungary in combination with increasing foreign debt and the public budget deficit seems to be one of the main reasons behind the depreciation of forint seen over the recent years.

High deficits of the balance of payment current accounts in a part of the new member states do not represent any significant danger for the euro area, while the current account in the euro area as a whole is balanced without any problems (in the past with a slight surplus and currently with a negligible deficit). A balanced current account is therefore not included in the Maastricht criteria. However, this criterion relates significantly to the macroeconomic stability of individual countries. This means that fast adoption of the common currency may protect domestic economies of countries with high deficits against rapid depreciation of the exchange rate.

#### **4. Implications for the Adoption of Euro in Individual Countries**

The overview of the development of fundamental economic variables in EU-8 countries suggests potential problems in adjusting to the requirements necessary for adopting the common currency. Elimination of exchange rate risks and reduction of transaction costs are the main benefits of adopting euro. The significance of these benefits varies under different conditions. Reduced exchange rate risks are especially important for countries with high deficits of the balance of payment current account.

These include especially the Baltic States and Hungary. The “euro umbrella” (or euro greenhouse) for these countries means protection against a monetary crisis, which could occur in the case of independent currencies as a result of financial speculations. Ensuring stability of the exchange rate may in particular cases outweigh all disadvantages? However, this does not apply to the Czech Republic, as it is a country with a positive balance of trade and its deficit of the balance of payment current account decreased to a sustainable level. The current account deficit in Slovakia is placed between these two positions and seems to be sustainable with some caution, as a great part of incomes of foreign companies is reinvested in the country.

Entering an environment with low inflation and low interest rates, which supports investment and growth, represents another major advantage for the economic growth in EU-8 countries. Interest rates in most EU-8 countries are higher than those in the euro area. Lower interest rates may function as a factor accelerating real convergence. However, this is associated with the danger of overheating the economy and subsequently slowing down the economic growth if the catching-up countries do not ensure sufficient priority in the growth of labour productivity compared to more advanced countries and the domestic demand is covered by unreasonable growth of import with excessive usage of foreign savings (the case of Portugal). However, once again this advantage does not apply to the Czech Republic, as the interest rates here are lower than those in the euro area, to be specific – by 1.25 percentage points in the middle of March 2007. In contrast, the interest rates would increase after joining euro and this would reduce motivation for investors.

Unlike benefits that do not apply to all countries to the same extent, reduced transaction costs associated with conversion of domestic currencies to euro is an undisputable benefit for all parties involved. This benefit is especially significant for exporters. The balance of benefits and costs differs from one community of interest to another. While appreciation of exchange rate helps to decrease import prices, reduces inflation pressure and explicitly benefits importers, excessively rapid appreciation of exchange rate has a negative impact on exporters and may inhibit the economic growth. Balancing price levels through the inflation channel is more advantageous for exporters as the impact is distributed throughout the economy, while the exchange rate channel influences solely their profits.

Direct participation in defining the common monetary policy of the euro area also ought to be mentioned as one of the benefits, although this policy primarily serves the interests of stability of the single currency. The disciplining influence of the Stability and Growth Pact, which should improve financial discipline, may also be of significance for some countries with jeopardized macroeconomic stability. (However, as the experience of Greece shows, the pressure of the Pact was not significant enough and various tricks were employed to avoid the required discipline.) The adoption of the common currency also brings greater transparency in quoting prices and wages in euros. This represents a certain “demonstration effect”, which may contribute to convergence of price and wage levels, in particular in geographically close countries and regions.

An assessment of benefits and costs for individual EU-8 countries differs greatly. The adoption of the single currency in Slovenia has been the easiest as the country has achieved a relatively high income per capita level and its comparative price level, too. Compliance with the Maastricht criteria was not a problem in



this case – the inflation rate decreased to 2.5% in 2005 and the public budget deficit was reduced to less than 2%. This is also reflected in the interest rates and in the level of public debt. The nominal exchange rate of tolar ceased to depreciate significantly in 2005. Slovenia therefore logically became the first candidate among the EU-8 prepared for joining the euro area and adopted euro from the 1<sup>st</sup> January 2007.

The Baltic States are on the opposite end of the scale with regard to the achieved income per capita level. However, this does not mean that these states should be among the last to join the euro. The Baltic States in general do not have problems with balancing the public budgets. Although the comparative price levels in these countries are low, this situation is more or less in accordance with their low income per capita levels. In addition, they are countries with small economies, countries that have practically never enforced independent monetary policies throughout their history. (Estonia and Lithuania apply the “currency board” exchange rate regime.) They also share high deficits of balance of payment current accounts, which may be problematic in the existence of an independent currency. Early entry in the ERM II exchange rate mechanism is justified by specific position of these countries.

Slovakia entered the ERM II mechanism at the end of 2005 and preparations for euro adoption are being made very intensively. Slovak koruna appreciated in last few years with acceleration in 2006 (year to year change 3,5%). The exchange rate could even break the upper limit of the fluctuation band (+15%). Some problems may occur with the inflation criterion in connection with incomplete price deregulations. The situation in the largest Polish economy is far more complicated and requires an in-depth analysis.

The Czech Republic maintains an excessively large difference between the purchasing power parity and the market exchange rate of CZK. According to the regression analysis, the comparative price level consistent with the country’s income per capita level should currently be around three quarters. This would mean the ERDI coefficient between 1.3 and 1.4, yet this coefficient was 1.7 in 2006. If the current rate of price level convergence of approximately 4% per year is maintained, three quarters of the EU-25 price level could be achieved in 7 or 8 years, i.e. during 2012 – 2013. Even then the CPL would be well below the regression curve that measures the relationship between the price level and the GDP per capita level due to the simultaneous progress of real convergence (the increase in GDP per capita in relation to EU-25 during 2012 – 2013 can be estimated approximately to 85%). Early adoption of the single currency associated with establishing a conversion rate of CZK against EUR equal to current market value would lead to unreasonably low evaluation of domestic financial assets

(corporate and private savings). A weak exchange rate means impoverishment of the country in relation to the other countries. Assuming that the current extent of the CZK nominal exchange rate appreciation is maintained (by 3.9% annually), postponing joining the euro by 3 years would mean an increase of the financial assets nominal values in euros by 12%. If the inflation rate were virtually equal to or only slightly higher than the inflation rate in the euro area, this would also mean increasing the real value of financial assets in relation to the other countries by approximately one tenth.

The problem of actually “weak” exchange rate cannot be solved by faster one-off appreciation at conversion of the domestic currency to euro because this would hinder export and the economic growth (in addition to the fact that the partners may not agree with an exchange rate determined in this manner). Market forces need certain additional time to naturally balance the CZK exchange rate with the purchasing power parity and the country’s income per capita level. The Czech economy therefore has more reasons for observing the “don’t hurry policy” in adopting the common currency. As Hungary and Poland do not aim for the euro area as quickly as it previously seemed, too, the Czech Republic would not be left alone, which decreases the risk of potential speculative attacks on the currency.

## **Conclusions**

All the EU-8 countries are the catching-up economies. A fast economic growth, enabling real convergence to the advanced countries, is therefore their highest priority. There are some risks for these countries connected with the common monetary policy, which is adjusted more to the conditions of stabilized advanced economies, forming the core of the euro area. These risks can be overcome on the basis of a fast labour productivity growth, accompanied by an adequate policy, ensuring the macroeconomic stability (see Spěváček, Hájek and Žďárek, 2006; Spěváček, 2006). The rapid productivity growth is raising the relative price level. The „Maastricht dilemma“, i.e. the simultaneous fulfilment of two objectives during the stay in ERM II – the price stability and the limited exchange rate volatility – enforces a rigorous monetary and fiscal policy. However, such strict policies may slow the economic growth. Another possible measure for keeping the price stability is a relaxation of the fluctuation band (its full exploitation to the upper and bottom limits), or a change of the central parity (revaluation).<sup>13</sup>

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<sup>13</sup> Such measures were used by the fast growing economies of Ireland and Greece during their stay in ERM II.

Assessing the benefits and costs associated with joining the euro is a challenging task because the benefits (comprising mainly elimination of undesirable rapid changes in the exchange rate and reduced transaction costs) need to be weighed against all disadvantages, in particular the loss of an independent monetary policy and the adaptation exchange rate mechanism. Exact calculation is practically impossible due to a range of future uncertainties. The opinions of some central bankers, according to whom the assessment of benefits and costs associated with adopting euro is a matter of faith rather than science, seem understandable in this context (see Frait, 2006).

Nonetheless, the issue of suitable timing and conversion rate cannot be resolved without even attempting to forecast a potential impact in the conditions of a particular country. A range of important circumstances should be considered. Potential inflation pressures that will occur when the exchange rate channel is no longer available in countries with previously low inflation should be taken into account. The intensity of these pressures can be estimated according to the current trends in appreciation of the nominal exchange rate, while respecting factors that may alter these trends in future. Losses in financial assets arising from potential underestimation of the exchange rate and on the other hand loss of competitiveness of the export and production arising from its potential overestimation are also very important. The current rate of appreciation or depreciation of the nominal exchange rate provides certain guidance for estimating these potential gains or losses.

While the new member states share many common characteristics, they also have some significant differences in relationship between nominal and real convergence. Suitable timing of adopting euro in each of the countries is therefore a very individual issue with no universal solution. Governmental institutions of the new member states are faced with the challenge of selecting a suitable date for joining the euro and negotiate an appropriate exchange rate that will not hinder competitiveness and growth of the economy but at the same time will not cause unreasonable “impoverishment” in relation to other countries.

## References

- [1] ČIHÁK, M. – HOLUB, T. (2001): Cenová konvergence k EU – pár nezodpovězených otázek. *Finance a úvěr*, 51, No. 6, pp. 331 – 349.
- [2] DĚDEK, O. (2006): Rizika a výzvy měnové strategie k převzetí eura. *Politická ekonomie*, LIV, No. 1, pp. 1 – 21.
- [3] DOBRINSKY, R. (2006): Nominal versus Real Convergence: The Balancing Act for New EU Entrants. [WIIW Workshop: Wider Europe: Opportunities and Future Challenges. (Mimeo).] Vienna: WIIW, 31. 3. 2006.
- [4] EUROSTAT (2006a): *Statistics in Focus*, 2006, No. 19. Luxembourg: EUROSTAT.

- [5] EUROSTAT (2006b): Sustainable Development Indicators. Economic Development, Competitiveness. Luxembourg: EUROSTAT.
- [6] EUROSTAT (2007a): National Accounts. Luxembourg: EUROSTAT.
- [7] EUROSTAT (2007b): Structural Indicators. Luxembourg: EUROSTAT.
- [8] ECFIN (2007): Statistical Annex of European Economy. Brussels: DG ECFIN, Spring.
- [9] FRAIT, J. (2006): Vyhodnocení nákladů a přínosů eura je spíše otázkou víry než vědy. *Bankovníctví*, No. 5, pp. 10 – 11.
- [10] GLIGOROV, V. – PODKAMINER, L. et al. (2006): Broader-based Growth Resilient to Global Uncertainties. [Research Report, No. 328.] Vienna: WIIW, July.
- [11] GLIGOROV, V. – PODKAMINER, L. et al. (2007): Private Consumption and Flourishing Exports Keep the Region on High Growth Track. [Research Report, No. 335.] Vienna: WIIW, February.
- [12] IŠA, J. (2005): Riziká európskej menovej únie. *Ekonomický časopis/Journal of Economics*, 53, No. 6, pp. 559 – 575.
- [13] KADEŘÁBKOVÁ, A. a kol. (2005): Ročenka konkurenceschopnosti české ekonomiky 2005. Praha: Linde.
- [14] KADEŘÁBKOVÁ, A. a kol. (2006): Ročenka konkurenceschopnosti české ekonomiky 2005 (Analýza). Praha: Linde.
- [15] MINISTRY OF FINANCE OF THE CR (2007): Macroeconomic Prediction of the Czech Republic. Prague: Ministry of Finance of CR, April.
- [16] SPĚVÁČEK, V. – HÁJEK, M. – ŽĎÁREK, V. (2006): Nabídka, poptávka, stabilita. In: Kadeřábková, A. a kol.: Ročenka konkurenceschopnosti České republiky 2005 (Analýza). Praha: Linde, pp. 72 – 89.
- [17] SPĚVÁČEK, V. (2006): Makroekonomická rovnováha české ekonomiky v letech 1995 až 2005. *Politická ekonomie, LIV*, No. 6, pp. 742 – 761.
- [18] VINTROVÁ, R. (2005): What GDP Indicators do not Tell You: Alternative Indicators of Economic Growth and Real Convergence. *Finance a úvěr*, 55, No. 11 – 12, pp. 579 – 595.
- [19] VINTROVÁ, R. – ŽĎÁREK, V. (2006): Konvergence České republiky a Slovenské republiky – současný stav a vybrané problémy. *Ekonomický časopis/Journal of Economics*, 54, No. 5, pp. 468 – 489.
- [20] VLÁDA ČR (2005): Strategie hospodářského růstu. Praha: Vláda ČR <[www.hospodarskastrategie.org](http://www.hospodarskastrategie.org)>.
- [21] VLÁDA ČR (2006): Vyhodnocení plnění maastrichtských konvergenčních kritérií a stupně ekonomické sladění s eurozónou. Praha: Vláda ČR <[www.mfcr.cz](http://www.mfcr.cz)>.