

Selected Issues Relating to Real and Nominal Convergence on New EU Member States

*Václav Ždárek, Jaromír Šindel**

Abstract

This paper analyses the process of nominal and real convergence of the New Member States of the European Union. It also discusses theoretical and methodological issues relating to this process. The importance of nominal and real convergence is underlined in connection with a successful catching-up. The EU-10 economies experienced in recent years robust economic growth, which had a positive impact on the convergence process. Although this favourable development of real convergence (GDP per capita measured at PPS) is accompanied by a simultaneous price (nominal) convergence (changes in relative prices and a convergence of price levels), the comparative price level is still biased towards lower level in comparison with the per capita income.

The disaggregated approach to comparative price level indexes revealed important consequences. The most often used regression in the real and nominal convergence process shows the slope of comparative prices level to GDP per capita in PPS near 0.8-0.9. If we do disaggregated approach, we get absolutely different results. The expected real convergence process will cause the increase in comparative prices level through the price increase in services, where the slope to GDP per capita is higher than in comparative price level for total goods.

The convergence process will require faster growth of prices in the economy than that achieved by the EU, which is to be underpinned, by productivity growth. Otherwise, it would undermine the competitiveness of firms. The relatively lower price level could be a serious macroeconomic problem in the process of euro adoption (*e. g.* in time of entering the ERM II, when the exchange rate channel will be phased out). That's why we thoroughly study the Balassa-Samuelson effect for the EU-10 states in third chapter (there are six subsection of every one of EU-10 economies for our analysis). Our discussion of other selected issues is in the third part.

Key words

nominal and real convergence, Balassa-Samuelson effect, relative price level, competitiveness, New Member States

JEL Classification: O11, E30, F15

* Václav Ždárek, Junior Researcher, Centre for Economic Studies, University of Economics and Management Prague (CES VŠEM), I. P. Pavlova 3, CZ-120 00 Prague 2, vaclav.zdarek@vsem.cz, +420 841 133 164; Jaromír Šindel, Junior Researcher, Czech Statistical Office, Na padesátém 81, CZ-108 00 Prague 10, jaromir.sindel@czso.cz, +420 274 054 364.

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1. Introduction

New EU member states are currently in a situation where in many cases a plan for introducing Euro is in place and a preliminary date for joining the Eurozone has been set. A decision on whether or not to join will need to be made in a few years time. The relevant countries will also be assessed by EU authorities as to whether they meet the determined criteria for entering the third stage of the economic and monetary union (EMU). An analysis of the development in nominal and real convergence of economies including comparison with other new member states (EU-10) is therefore highly relevant and necessary. Furthermore, experience with development before and after introducing Euro in selected old EU member states should not be ignored.

However, significant changes cannot be expected within just a few years. The economic standard will continue to grow at a slower pace over the next few years as the new member states approach the level of the European Union. On the other hand, price (wage) levels and labour productivity should grow faster compared to the current rate to ensure smooth progress of integration in the Eurozone. These changes should arise from adjustment that does not lead to a high price (and subsequently wage) rise without the corresponding growth of labour productivity. Potential price and wage spiral would only ultimately lead to a fall in the real living standard and halt the convergence process. This is why the new member states cannot be expected to reach the average European economic standard sooner than in a few decades. After all, even those less developed countries that joined the EU in the 80s have not reached the economic or price level of other developed EU countries to this day.¹

The paper focuses on selected issues relating to real and nominal convergence of economies of the new member states (EU-10). The first chapter addresses selected theoretical and methodological issues associated with international comparison and convergence of economies in time. The second chapter includes empirical verification using data for the new and selected old EU member states. Current problems (Balassa-Samuelson effect, real rate) of countries aiming to join the Eurozone are discussed in the third chapter and the final part presents a brief summary of potential issues and problems.

2. Convergence

Convergence is a process defined as approaching a certain level or decreasing a difference between two values over time (the difference between the two variables reduces over time towards a zero value). For example Greene (2003) presents rigorous theoretical definition. The meaning of the term nominal and real convergence according to individual authors is not without certain ambiguity. Real convergence is defined as approach of the economic standard towards the level of another developed country or a group of countries (within an integration group). It is usually measured by GDP per capita in the purchasing power parity², which

¹ The experience of united Germany illustrates the consequences of fast convergence (see Rother, Süppel, 2003).

² GDP p.c. in the purchasing power parity reflects the country's economic standard in international comparison. When spatial comparison is carried out, volume indexes are expressed in the purchasing power parity to exclude price level differences. This indicator expresses the real "physical volume" of goods and services available to the relevant economy for consumption and investment (including the balance of foreign trade). It is necessary to

excludes the impact of different price levels and documents the actual volume of goods and services produced by the relevant economy.³ (The so-called Copenhagen criteria for candidate countries striving for membership in the EU or the Eurozone are often referred to in this context. However these criteria have a broader scope.⁴)

In the case of real convergence (the so-called absolute convergence concept), the theoretical foundation lies in the neoclassical growth theory, which assumes convergence towards a steady status (identical for all economies) influenced by a variety of characteristics and parameters of the relevant economy (savings, population growth, degree of depreciation of the capital assets used, *etc.*). However, this theoretical concept did not provide satisfactory explanation to the tendencies observed in reality (catching up with developed countries by less developed countries). Empirical analyses carried out by individual studies produced a range of different and sometimes even contradictory results. In reality, in many cases less developed countries remain at their lower levels and no convergence is observed or the gap between developed and less developed countries broadens. On the other hand, rapid convergence contradicting the theoretical assumptions of the neoclassical growth theory is observed in some other countries. This has led on the whole to the persisting necessity to seek alternative concepts and explanations.

A number of new approaches explaining the phenomena observed in reality have been presented over the last two decades. Modern concepts of the endogenous growth theory have developed and reflect a range of additional up to now neglected factors, such as education of the population, institutional quality, *etc.* One permanent status for otherwise identical economies cannot exist due to these dissimilar qualities. These models can provide a theoretical description of empirically documented development of economies with a broader gap in the economic level that grow faster than others. Some countries grow faster than others in spite of the achieved higher economic standard, while others may continue to lag behind (conditional convergence models, for instance β -convergence, σ -convergence, see for example Barro, 2004).

Nominal convergence is a process defined either in the broader sense as the convergence of absolute values and growth rates in connection with the Maastricht criteria⁵, *i. e.* nominal values (interest rates, inflation rate, deficit and public debt, exchange rate criterion and criteria determined as a hypothetical standard for their fulfilment),⁶ or in the narrower sense as convergence of individual economies in their price (and economic) levels (see Frait, Komárek, 2004).

distinguish between the PPS unit and PPP of the currency (for example US dollar) published by OECD (the USA are the country of reference) or WB. PPS is an artificial unit created by EUROSTAT according to the average price level in the EU states and this is why its values vary even within individual EU countries. PPS is an artificial monetary unit created on the basis of Euro and calculated from the average price levels in member states (previously EU-15, currently EU-25) and thus practically fulfils the function of a double converter (prices and rate).

³ For instance, Slavík (2005) also understands real convergence as structural approaching between economies or technologies used.

⁴ The main issue being the existence of a functional market economy and the ability to cope with competition pressure in the EU (see Čech, Komárek, 2002a).

⁵ These criteria have been determined in order to assess development of economies striving to join the Eurozone, *i. e.* achieve “full and equal” position in respect of other EU member states.

⁶ Compare for example Vávra (1999).

The mutual relationship between real and nominal convergence, *i. e.* the relationship between the economic standard achieved (GDP per capita) and the price level is bilateral, mutually influencing and determining (see for example Dobrinsky, 2006). Countries at a lower economic level typically have lower price and wage levels. As the economic standard increases, the price level tends to rise (due to inflation differential, as well as rising exchange rate). These processes gradually lead to the elimination of the cost-based competitiveness of local companies. If the economy is to retain its dynamics, progress towards non-price (qualitative) forms of competitiveness is necessary.

2.1 Price level and economic standard

If the relatively strict assumptions of the PPP theory (Purchasing Power Parity, see for example Rogoff, 1996) were valid, prices of tradable assets in individual countries converted to one currency should be identical (international arbitrage should lead to their harmonisation in the long run). Differences in the price levels would then be due to differences in the prices of non-tradable assets in the economy and their significance (relative weight), depending on the economic level achieved (income per capita, wage levels). A higher economic standard would imply a higher price level. The relationship between the price level and the economic standard should theoretically display positive correlation and this is often the case in practice (see for example Vintrová et al., 2002).

However, in reality this relationship is disrupted by a number of factors. Firstly, it is the existence of tradable and non-tradable assets (for definition see below), although differences between individual countries exist even within tradable assets. Despite this, empirical observations of the relationship between the price level and the economic standard often display certain interdependence of the two variables (see below) and confirm the theory mentioned above (see Balassa, 1964; Samuelson, 1964), which explains differences in the national price levels by different values of labour productivity in the tradable assets sector. For more detailed theoretical discussions and elaboration on the relationship referred to above, see for example Čihák, Holub (2001).

In reality, harmonising prices of assets in individual countries, *i. e.* enforcing the law of one price, or in the broader sense the theory of absolute purchasing power parity is obstructed by a variety of factors. These obstacles are associated with free trade, the existence of transport and transaction costs, *etc.*⁷ Differences not only between non-tradable, but also between tradable assets are therefore observed in practice. (Assets are hereinafter used as a general term for goods as well as services.)

Exact differentiation between tradable and non-tradable assets is not intuitive as it may seem at first. This differentiation is based on the fact that practically no asset in the current economy is purely (non)tradable as it contains a portion of tradable and a portion of non-tradable goods and services at its creation. The price differential of a particular asset between the relevant countries

⁷ Overview of potential arbitrage obstacles (see for example Skořepa, 2001) or EC (2002).

and the cost of arbitration are also important factors. Only after a certain level of the difference between prices in individual countries is achieved, the relevant asset may be considered tradable (however, this negotiability is eliminated by the arbitration process itself). This differentiation is therefore an arbitrary issue and using terms such as “more or less tradable asset” and “more or less non-tradable asset” would appear more appropriate (see Skořepa, 2001, comp. Obsfeld, Rogoff, 1998). This differentiation of assets will be applied in the following text (despite the abbreviated reference as (non)tradable assets being used).

However, not all economists see the problems in and discrepancies between the criteria of real and nominal convergence quite unambiguously (see Dědek, 2002). Frequently highlighted issue in the case of transitional economies with different economic structures and usually modified adjustment mechanisms, *etc.* is the fact that excessive effort to promptly meet the required criteria for nominal convergence may have a significant impact on economic growth.⁸ (The previous statement is documented by the impact of the Balassa-Samuelson effect, hereinafter only as B-S effect.⁹) The situation when the country is about to join the monetary union, as it is in the case of the new EU member states, is all the more significant.

Price structures of transforming economies are influenced to a great extent not only by the former regimes and pricing, but also by changes in prices associated with structural changes in the economy, changes in demand, *etc.* This naturally leads to adjustment of price relations depending on the flexibility of individual prices. If prices are inflexible downwards (and this is a phenomenon typical for most developed and transitional economies), this process results in an increase in the price level and a change in relative prices, which represent one of the reasons of price convergence of an economy.

Therefore economic growth generating pressure on the current account and inflation (B-S effect) associated with adjustment of relative prices and elimination of regulatory measures on one side occurs simultaneously with the reaction of stabilising policies supporting smooth progress or aiming to eliminate as many disrupting effects as possible on the other side.¹⁰ Values for the relevant criteria should therefore be used cautiously and the potential risks associated with their use should be highlighted during the progress of convergence.¹¹

In this context it is necessary to realise that an excessively low inflation rate (due to problems with its measuring) may lead in a transitional economy to “smothering” economic growth. On the other hand, “breaking” inflation expectations, which often include a very significant adapting element in their creation by economic entities, represents a serious problem for monetary authorities. Monetary authorities should therefore work with an estimated growth

⁸ A competitive relationship between economic growth and the rate of price increase within the relevant “corridor” is postulated. However, in view of new growth theories this assumption is no longer relevant.

⁹ Overview of literature on this topic and a more in-depth analysis of B-S effect (see for example Čihák, Holub, 2001; Holub, Čihák, 2003; Égert, 2003, 2006).

¹⁰ Flow of capital intended for financing the gap between savings and investments in the local economy may present a major problem. Naturally, this capital flow is a desirable phenomenon supporting the convergence process. Nonetheless, it is necessary to bear in mind that expansive monetary policy in connection with unsterilized inflow of capital may lead to problems with the Maastricht criteria.

¹¹ As highlighted for example by Sorsa (2006).

rate of productivity, expected distortion in the inflation rate calculation and the required criterion. Combining all of these aspects should lead to a compromise which will not influence the rate of real or nominal convergence.¹²

2.2 Problems with measuring and difficulties associated with international comparison

When evaluating and generalising in international comparisons, additional problems arising from differences between national procedures for constructing identically named indicators are encountered (even within unified methodological standards, such as the national account system ESA 1995). National statistical authorities within the EU respect certain rules (developed by EUROSTAT) allowing international comparison.¹³

International economic productivity is only comparable if it is defined identically from the methodological point of view and reported in the same units. In practice this means converting national prices (and currencies) to international prices (currencies). Comparisons are based on a reference country or a group of countries (integration group). PPS¹⁴ (*Purchasing Power Standard*) is used in the EU for the purposes of economic level.

The Comparative Price Level (CPL) uses an identically defined indicator referred to as PLI – Price Level Index. This non-dimensional indicator represents the price level of a particular asset compared to another country or a group of countries. CPL is calculated as a fraction of the price of the asset in PPP (or PPS) and the nominal rate of the compared countries.

The EU-8 states (alongside with other EU members) are undergoing significant structural changes in their economies. This development naturally results in rapidly outdated prices used in conversions to fixed prices and more frequent updating would therefore be required for obtaining a “truthful” reflection. If prices of assets subject to frequent innovation are fixed over an excessively long period of time, major distortion occurs.¹⁵ This can be currently solved by transition from reporting real growth rates in fixed prices to the so-called chaining method. In the case of product innovations this problem is addressed to a great extent by new

¹² In the case of the Czech Republic, the corridor determined in the past was relatively narrow. The current ČNB target (3 %) is closer to the lower border line (given that the interval for price increase of 0–2 % per year is considered price stability and additional 2 % account for the impact of the B-S effect, this combination with exchange rate appreciation by 0.5 % meets the potential ECB target of 2 % plus 1.5 %). Therefore, in combination with exchange rate changes the price growth appears consistent. Problems in the evaluated stage will occur if three economies report zero (or even negative) growth in prices. In this case the criterion limit could be 1.5 % or lower. However, according to official EU materials this outcome is not possible (see EC, 2005, p. 20). Similar conditions apply to the minimum period required for remaining in the ERM-II (exchange rate appreciation is allowed). For an alternative opinion see Janáček, Janáčková (2004).

¹³ The change in calculation of the GDP indicator in EU countries is associated with the so-called relocation of FISIM. The new method results in changes in the absolute value of GDP and the subsequent impact of the growth rate may be significant (see EUROSTAT, 2005b). Economies that have affected both of these changes can be used as an example (see WB, 2006, p. 8). While the change in the growth rate for Hungary is in tenths of p.p., the same change in the case of less developed countries (Estonia) may be in whole p.p.;

¹⁴ Besides the so-called current parity, OECD also constructs fixed parity, which differs from the current parity in fixed structure of the relevant aggregate (GDP) during a certain year and for the following period (during the following years the indicator is extrapolated with deflators or real growth rates). Fixed parities are used for monitoring the relative growth performance of a particular economy (the inaccuracy is greater with a longer timeframe as the structure of prices changes), while current parities are used for example for quantifying the current position of the economy in terms of the international aggregate (spatial comparison in the given time), etc. Again, deviations of both indicators may be a few percentage points, which is why countries are classified in groups with certain levels of income (see Spěváček, 2003; Schreyer, Koechlin, 2002).

¹⁵ As a number of studies points out (see for example Janáček, Janáčková, 2004; Janáčková, 1999).

chaining methods with annual updates of prices used for calculation of indicators (such as GDP in fixed prices). Average prices for the previous period are used in this case.¹⁶ Within the EU-8, statistical authorities in Poland, the Czech Republic and Lithuania have changed over to this method and other EU-8 states will do so before the end of 2007 as agreed.¹⁷

3. Results and discussion

The empirical part will focus in greater detail on the actual development of real and nominal convergence during the period 1995–2004 (2005), for which the relevant data is available usually in two individual sections (1995–2000) and (2001–2005). The choice of these intervals was more or less arbitrary in order to distinguish between different stages of the actual development. Dividing the relevant period into sections 1996–1998 and 1999–2004 arising from the accession of selected countries to the Eurozone (introducing a joint currency) may present an alternative view on the issue.

3.1 Real convergence

The Czech economy did not display a significant rate of real convergence (change only 4.6 p.p.) throughout the entire monitored period (see table 1) and the rate achieved by the Czech economy is therefore slower by one half compared to that achieved by Poland (however, the higher growth rate achieved by this economy is based on the growth from a lower basis) or one third of the rate reported by the comparable Slovenia (given that the specific development in Cyprus, Malta and Baltic states is disregarded). Examination of the development in two individual periods reveals that this generally very weak result is influenced by the development during the first stage (1995–1999), in particular by the 2nd recession during 1997–1999.

A positive turnaround occurred in the second period (during 2000–2005), when the CR reported the greatest real convergence dynamics of the EU-5 states, followed by Hungary and Slovenia. Poland reported very slight growth at the beginning of the new century due to certain macroeconomic problems. The high increase of GDP in Slovakia over the last few years was not reflected in real convergence for a number of reasons, which included the effect of fixed prices used in GDP calculation (for more details on the issue of reported and actual convergence rates for economies see the section dedicated to convergence in the study Spěváček et al., 2005).

¹⁶ Statistical calculations as such present a relatively complex task and a variety of procedures for the chaining method providing quite varied data on the growth rate of the relevant aggregate with identical input details exist (see Landefeld, Moulton, Vojtech, 2003).

¹⁷ Furthermore, it is necessary to bear in mind that modern economies strongly involved in international connections report domestic productivity indicators (of a production type, such as GDP) that do not take into account primary income of production actors flowing to and from abroad. The amount of dividends paid out abroad by affiliated companies from the relevant country is a typical example of this issue. According to the new national accounts, in 2004 this flow in the CR accounted for almost 5 % of GDP (4.87 %), while the same percentage for Ireland was more than 15 % (15.4 %), author's calculation from (OECD, 2006a).

Table 1: GDP per capita in the NMS, 1995-2004 (the EU-25 average = 100)

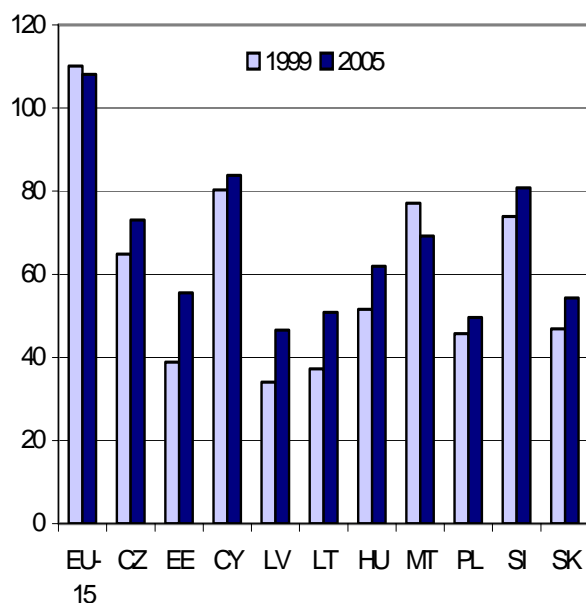
	1995 ¹⁾	2000	2004	2005 ²⁾	Change (p.p.)	
					1995–2005	2000–2005
Czech Republic	68,4	63,7	70,0	73,1	4,7	9,4
Hungary ³⁾	48,4	52,7	60,0	62,0	13,6	9,2
Poland	40,6	46,8	48,9	49,6	8,9	2,8
Slovakia	43,9	47,3	51,5	54,3	10,4	7,0
Slovenia	67,7	72,6	78,9	80,8	13,0	8,1
Estonia	33,5	40,8	51,1	55,6	22,0	14,8
Lithuania	33,5	38,3	47,6	50,9	17,3	12,5
Latvia	29,0	35,3	42,7	46,6	17,5	11,3
Cyprus	80,6	81,1	82,4	83,8	3,1	2,7
Malta	..	77,6	69,2	69,2	..	-8,4
Portugal	74,8	80,6	72,2	70,9	-3,9	-9,7
Greece	70,3	72,6	81,9	83,8	13,4	11,1

Note: ¹⁾ EUROSTAT estimate, ²⁾ EUROSTAT forecast, ³⁾ Hungary changed the methodology for measuring of GDP since 2002 (allocation of FISIM to user sector/industries), thus its figure aren't compatible with other states of the EU-25.

Source: EUROSTAT, Structural Indicators (18th of April, 2006), own calculation.

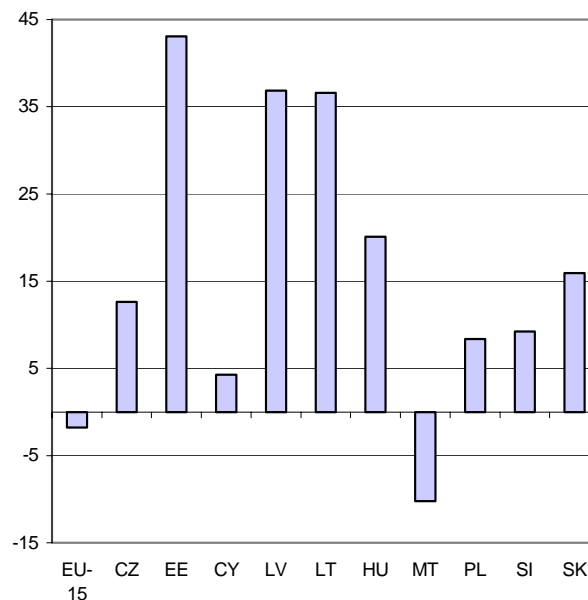
The following figure nos. 1 and 2 show the economic levels of individual EU-10 countries during the period 1999–2005. Figure no. 1 presents an overview of changes in the economic levels of individual countries, while figure no. 2 illustrates the same development in relation to the EU-25. Development in the EU-15 is included in both figures for comprehensive outlook.

Figure 1: Economic level in the NMS and the EU-15 (the EU-25 average = 100)



Note: Data for 2005 are forecast of EUROSTAT.
Source: EUROSTAT, Structural Indicators, National Accounts (18th of April, 2006), own calculation.

Figure 2: Changes in economic level in the NMS and in the EU-15 in comparison with the EU-25, 1999–2005

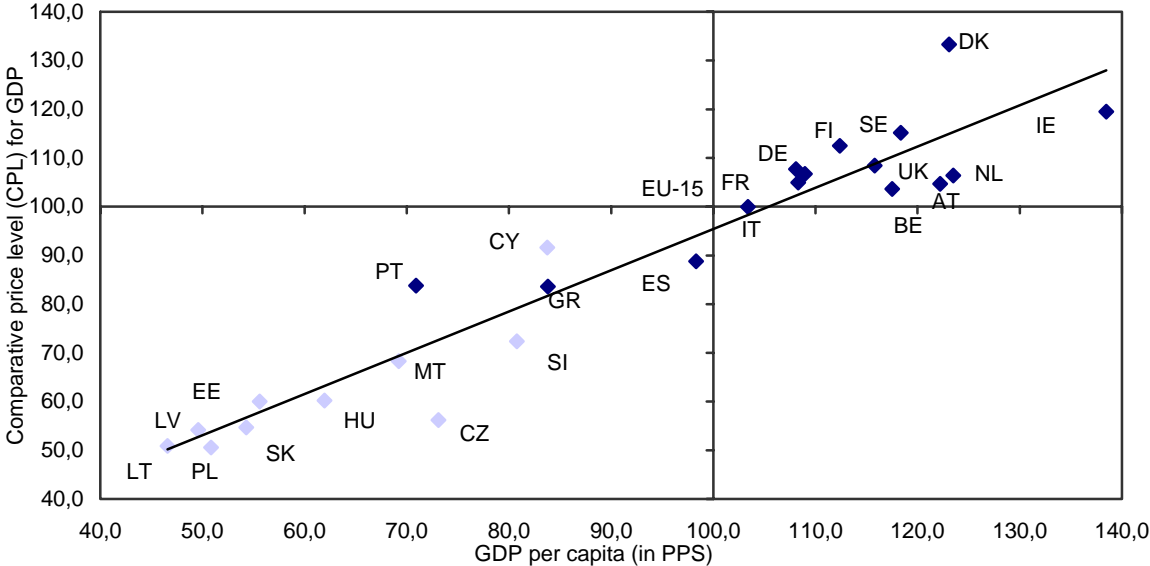


Note: Data for 2005 are forecast of EUROSTAT.
Source: EUROSTAT, Structural Indicators, National Accounts (18th of April, 2006), own calculation.

Figure no. 3 illustrates the frequently used relationship between the economic standard and price level of all EU countries. The correlation between the economic standard (expressed by GDP per capita in PPS) and the price level of the overall GDP in the EU-25 group is very

close. The slope of the regression line (0.85) is relatively close to one and as previously theoretically shown by (Čihák, Holub, 2001, p. 335), a unit slope of the line is not a condition because its value is influenced by the portion of non-tradable assets in GDP and the share of the capital used for producing non-tradable assets. The explanatory capacity of this simple regression is relatively high (91%).

Figure 3: Relationship between price and economic level of a country (the EU-25 average = 100, 2005)



Note: Luxemburg is omitted from the analysis. Linear regression: $CPL = 0,107 + 0,8475 \cdot GDP$, $R^2 = 0,91$.
 Source: EUROSTAT, Structural Indicators, National Accounts (18th of April, 2006), own calculation.

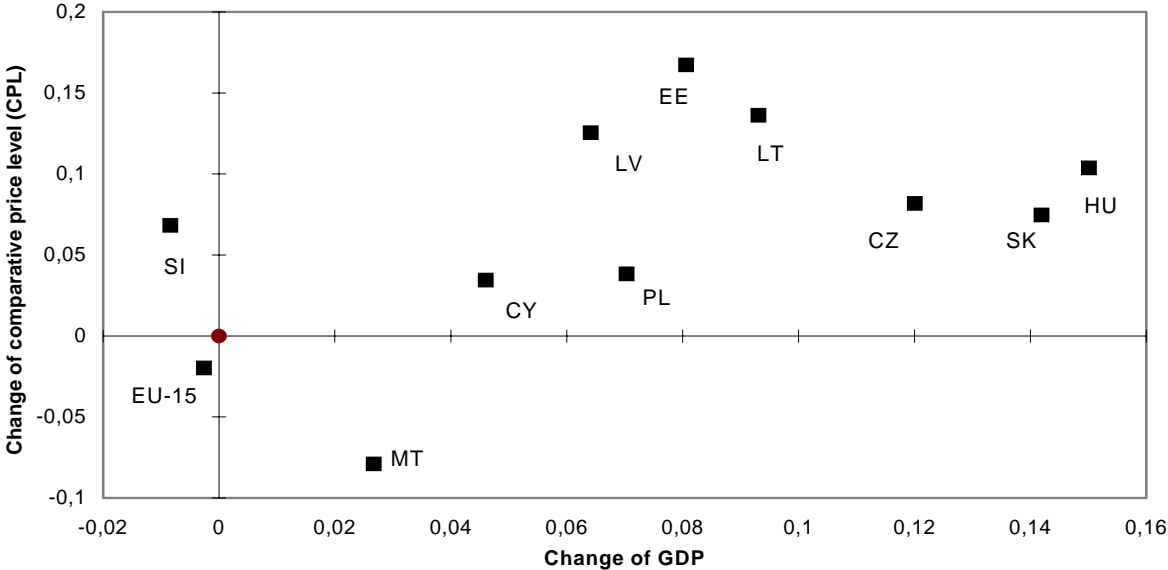
Figure 3 shows that the price level of the Czech economy is apart from the price level of the European Union downwards far more than a distance corresponding with the difference in the economic standard would be. The Czech economy (and Slovenia) differs from economies of other new member states in this regard as their distance from the EU-25 price level in most cases matches their economic standard. The price levels of other economies are directly on the regression line, suggesting correlation between the economic standard and the price level, or very near the line (for discussion of possible causes see below). Northern European countries, France and Germany stand out from the group of the most developed EU countries – their price level displays upward divergence, while Belgium, Ireland, Netherlands and Austria depart from the overall EU level downwards.

The change in the economic and price level in the EU-10 countries recorded in the following figure 4 is also interesting for our purposes. The figure clearly shows a group of countries displaying growth in their economic standards, as well as the price levels (the first quadrant). Applying an imaginary diagonal (45° line) to the quadrant reveals differentiated development between Baltic countries (real convergence is faster than nominal convergence) and the CR, Hungary a Slovakia (nominal convergence is faster than real convergence). Only Malta (price

increase and economic divergence) and Slovenia (stagnation of the price level and real convergence) display significantly different development.

Table 2 summarises a different outlook of the changes in the price levels in EU member states. It shows that during the period 1995–2004 only one economy displayed a decrease in the price level (Slovenia by 1.3 p.p.), very slight growth was recorded in Poland (4.2 p.p.) and Cyprus (4.0 p.p.). The Czech Republic recorded growth by 14.8 p.p., which is nearly equal to the price level growth observed in Hungary (15.1 p.p.). While the growth in the CR was distributed more evenly, significant growth in Hungary occurred over the last five years (2000–2004).

Figure 4: Changes in GDP (PPS) per capita and comparative price level (CPL) in the NMS, 1999–2005



Source: EUROSTAT, Structural Indicators, National Accounts (18th of April, 2006), own calculation.

When the price level of the Czech economy is used as the basis, its expression in relation to the other EU-5 countries generates interesting results. The standard of the Czech economy is somewhat higher than that of Poland and Slovakia and this is consistent with the achieved higher economic level. On the other hand, the price level in the CR compared to Hungary and Slovenia is lower although the CR’s economic level is higher (than that of Hungary) and lower than in the case of Slovenia. The very fast growth in the price level in Hungary would be worth analysing in detail in order to find caused that led to this development.¹⁸ The growth in Poland (up to 2000) followed by a significant fall in the price level (according to preliminary data available the price level for 2005 is once again above the 50 % margin) is also very interesting. Development in two less developed EU countries (Portugal and Greece) was included for comparison.

¹⁸ The fact that many Austrian residents have commuted to Hungary over many years in order to make use of the local cheaper services may be one of the possible explanations. This may have pushed the local prices up to an extent reflecting in the overall price level. Data on the price level development would be required for confirming these conclusions.

The implications for nominal convergence are more than obvious. While real convergence in the selected EU-10 countries during the current period has developed significantly better than in the previous period and the Czech economy is progressing towards a leading position among these catching-up economies, nominal convergence lags behind. Figure 4 illustrates this discrepancy and shows a clear downward divergence in the CPL in the case of the Czech economy, which is a situation worthy more detailed discussion.¹⁹

Table 2: Comparative price level (CPL) for GDP in the NMS

	EU – 25 = 100				Change in CPL (p.p.)			Czech republic = 100 (year 2005)
	1995	2000	2004	2005 ¹⁾	1995–2000	2000–2005	1995–2005	
Czech republic	38,6	45,9	53,4	56,2	7,3	10,3	17,5	100,0
Hungary ²⁾	43,8	47,0	58,9	60,2	3,1	13,2	16,4	107,2
Poland	44,0	51,6	48,2	54,2	7,6	2,6	10,2	96,5
Slovakia	40,8	42,9	52,4	54,7	2,0	11,8	13,9	97,4
Slovenia	74,4	71,4	73,0	72,4	-2,9	0,9	-2,0	128,8
Estonia	38,4	52,5	57,5	60,0	14,1	7,5	21,6	106,8
Lithuania	25,9	46,2	48,6	50,6	20,3	4,4	24,6	90,0
Latvia	33,2	50,3	49,7	50,9	17,7	0,5	17,2	90,6
Cyprus	85,9	87,7	89,9	91,6	1,8	3,9	5,7	163,1
Malta	..	68,8	68,0	68,3	..	-0,5	..	121,6
Portugal	74,5	74,1	83,0	83,8	-0,6	9,9	9,3	149,2
Greece	77,5	81,3	82,0	83,6	12,5	4,8	6,1	148,8

Note: ¹⁾ values for year 2005 are forecast of EUROSTAT, ²⁾ Hungary changed the methodology for measuring of GDP since 2002 (allocation of FISIM to user sector/industries), thus its figure aren't compatible with other states of the EU-25.

Source: EUROSTAT, National Accounts (18th of April, 2006), own calculation.

3.2 Selected circumstances of nominal and real convergence

Unlike in the case of other new EU members (Hungary, Poland or Slovakia), a significant characteristic of the Czech economy has been a long-term downward deviation in the price level from the expected (theoretical) value.²⁰ As there are a few types of consequences associated with this phenomenon,²¹ the following text mentions selected consequences only.

The relationship between the real and nominal convergence process has been often matter of the analysis (see figure 3). We used also the disaggregated approach and analysed the relationship between real convergence process derived from GDP per capita in PPS and the

¹⁹ Improvement in terms of trade (T/T), when prices of exported goods and services grow faster than import prices, is another issue this paper chooses not to address. The CR has the most positive development of T/T within the EU-25 (except for Lithuania); T/T for the CR increased by 12% between 1995 and 2004. Slovenia was also among the EU-5 countries with positive long-term development of T/T. By contrast, Poland and Slovakia experienced strongly negative development of T/T, in particular during the period before 2000 or 2001, see for example Vintrová (2006).

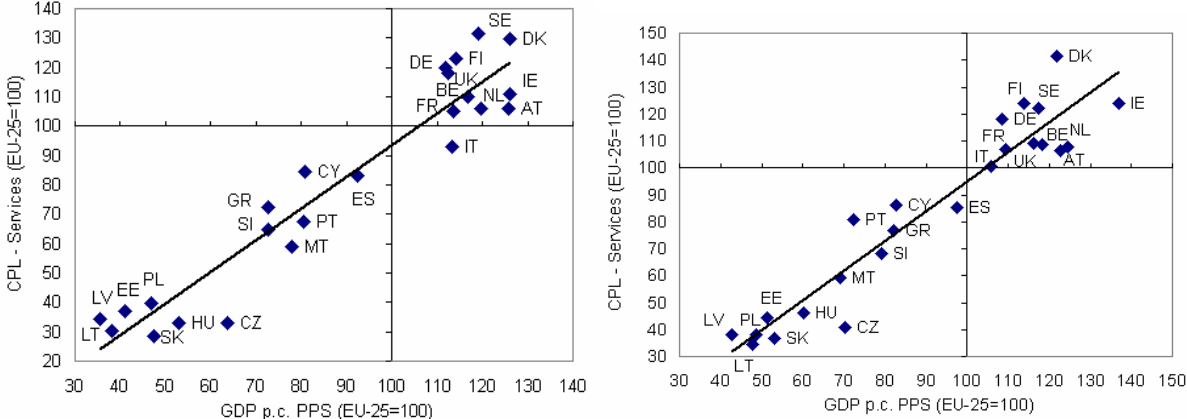
Improvement in T/T is not reflected in the growth of GDP in fixed prices because it is considered a price change. However, the benefit of improved T/T is available to the relevant economy and increases its real income above the level determined by the growth in the overall product. This phenomenon is reflected in the alternative indicator of real gross domestic income (RGDI) introduced by the national account statistics in the ESA 1995 methodology.

²⁰ However, for example Croatia recorded a completely opposite status – the price level was higher than the economic standard, see Nestić (2005). Turkey, Switzerland and Norway or outside Europe New Zealand and Mexico present some more different examples.

²¹ Some are mentioned for example in an article by Janáčková (1999).

disaggregated nominal convergence process quantified by comparative price levels for total services and total goods.

Figure 5: Comparative Price Level for Total Services in 2000 (left) and 2004 (right)

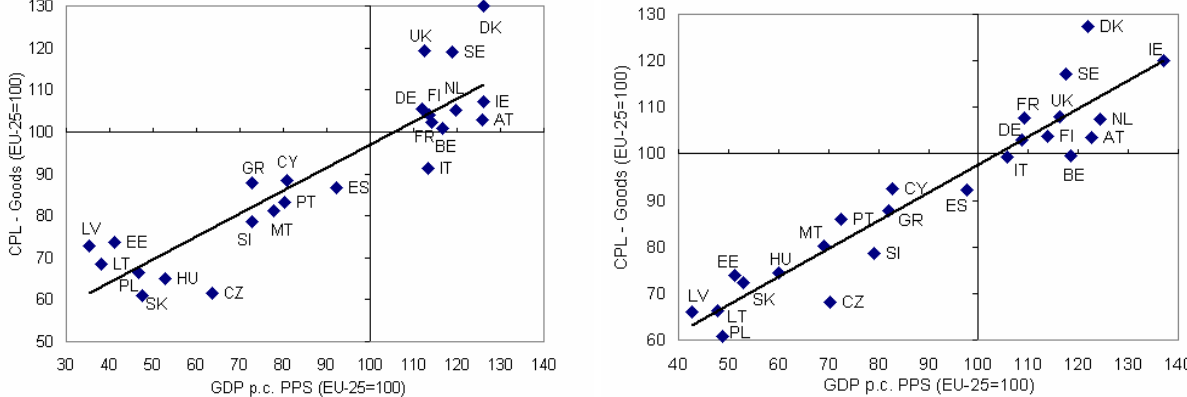


Note: Luxembourg is omitted. Linear regression: $CPL = -14,2 + 1,08 \cdot GDP$, $R^2 = 0,91$ in 2000 and $CPL = -15,0 + 1,10 \cdot GDP$, $R^2 = 0,91$ in 2004.

Source: EUROSTAT, Economy and Finance, Prices (28th of April, 2006), own calculation.

From simple linear regression we got absolutely different results. The slope of CPL for total services is more than 1 and the slope for total goods is between 0,5 and 0,6 (the slope of CPL for GDP is below 1). It can be roughly explained by the tradability of goods and services, but we can also perceive differences among new Member States from the change of CPL.

Figure 6: Comparative Price Level for Total Goods in 2000 (left) and 2004 (right)

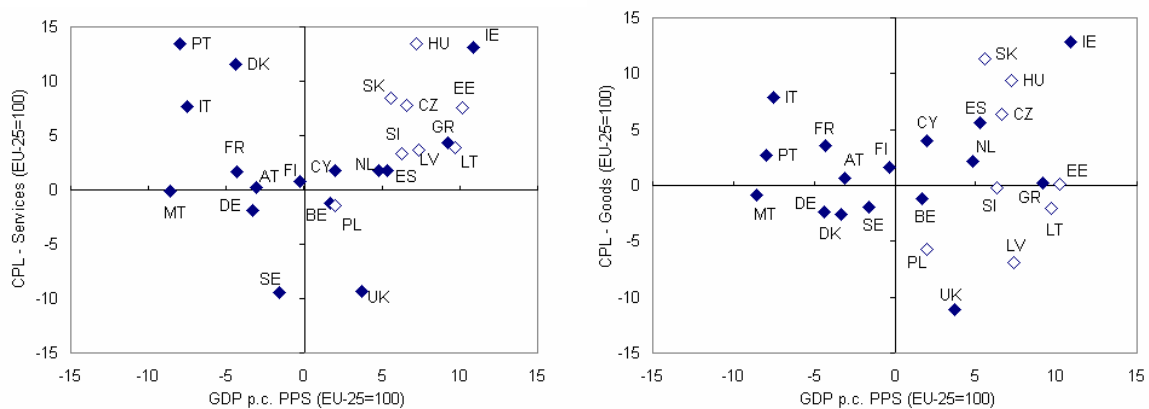


Note: Luxembourg is omitted. Linear regression: $CPL = 42,0 + 0,55 \cdot GDP$, $R^2 = 0,81$ in 2000 and $CPL = 37,5 + 0,60 \cdot GDP$, $R^2 = 0,89$ in 2004.

Source: EUROSTAT, Economy and Finance, Prices (28th of April, 2006), own calculation.

The CPL for total services in new member states is joined with the continuing real convergence process. As comparative price level for total goods is not connected with the real convergence process (see figure 6 and 7), we cannot expect the substantial increase in CPL for total goods during the progress in real convergence process. This is supported for new member states by figure 7, where the change of the real convergence process is joined with the change of the CPL for total services. But it does not hold for the change of the CPL for total goods.

Figure 7: Change of GDP (per capita in PPS) and Comparative Price Level for Total Services (left) and for Total Goods (right) between 2000 and 2004.



Note: Luxembourg is omitted.

Source: EUROSTAT, Economy and Finance, Prices (28th of April, 2006), own calculation.

By analysing the nominal convergence process we do not want to focus only on the levels of new member states, but also explore the comparative price level index for disaggregated levels and different group of countries. The continuing real and nominal convergence process among the EU-25 Member States is visible from table 3. The standard deviation of the CPL index²² for GDP declines from 27,5 in 2000 to 25,8 in 2004 in the EU-25 and is much higher than in the EU-15 (13,3) or in the Eurozone Member States (11,3). These differences are mainly caused by the CPL for total services (compare 33,5 for total services with 18,5 for total goods), by the CPL for government final consumption expenditure (compare 36,0 with 25,2 for households final consumption expenditure or with 19,9 for gross fixed capital formation). Origins of the different CPL result from the role of non-tradable in the service sector and the role of a government (regulated prices and non-tradability in government sector).

By analysing the standard deviations for disaggregated levels, we can also notice its increase for the gross fixed capital formation, durable and capital goods, however their CPL have the lowest standard deviation among the EU-25 Member States (19,9; 14,3 and 19,9 respectively). For the new Member States and especially for the post-transition countries (NMS-4) the increase in the standard deviation, which is visible in almost all spheres of CPL, is interesting. The highest differences between standard deviations are in CPL for gross fixed capital formation, capital goods and total goods in 2000 and 2004 (CPL decreased in Poland in comparison with increase in the Czech Republic, Hungary and Slovakia). Such a different development confirms very low increase of CPL for Poland from the table 2. As was noted the standard deviation of CPL is much higher among EU-25 than among the Eurozone Member States, but we can also observe two stable groups from table 3 – the Eurozone (EU-12) and new Member States (NMS-10) with the similar standard deviation levels.

²² Eurostat publishes the Price convergence indicator, what is the coefficient of variation of comparative price level index for final household consumption in %.

Table 3: Progress in convergence process

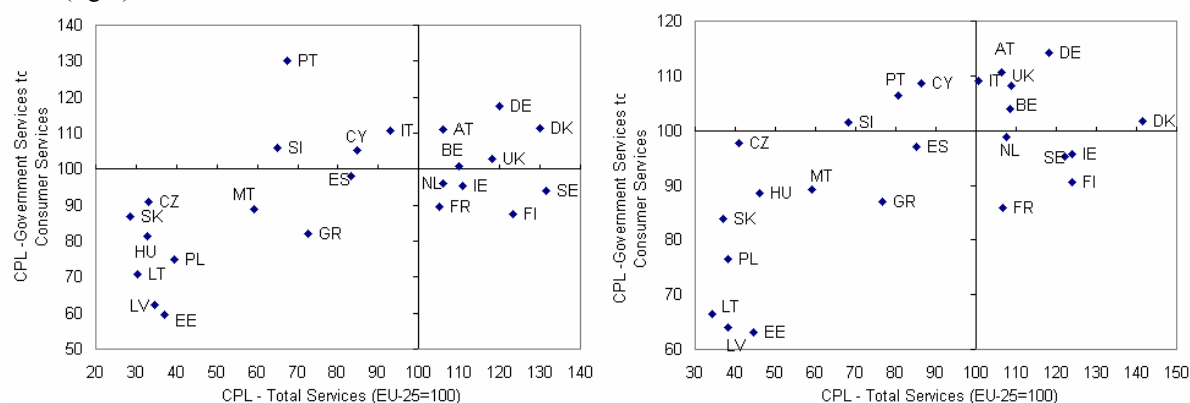
	EU-25		EU-12		NMS-10		NMS-4	
	2000	2004	2000	2004	2000	2004	2000	2004
GDP p.c. (PPS)	31,4	29,0	17,1	<i>17,9</i>	16,0	13,3	6,8	<i>8,1</i>
CPL - GDP	27,5	25,8	12,8	11,3	13,9	12,7	3,2	<i>3,8</i>
Actual individual consumption	29,3	27,9	13,6	13,1	15,8	14,3	3,8	3,4
Actual collective consumption	36,1	33,6	17,6	15,2	18,9	17,5	4,2	<i>5,0</i>
Gross fixed capital formation	19,7	<i>19,9</i>	12,3	<i>13,5</i>	6,2	6,2	2,7	<i>6,6</i>
Final consumption expenditure	30,2	28,6	14,0	13,2	16,3	14,7	3,9	3,6
Household final consumption expenditure	26,7	25,2	13,6	12,5	14,2	12,5	4,5	3,5
Government final consumption expenditure	38,1	36,0	18,3	16,8	20,7	19,5	2,8	<i>4,5</i>
Total goods	19,2	18,5	8,4	<i>9,3</i>	8,5	<i>8,6</i>	2,3	<i>5,2</i>
Consumer goods	19,8	18,8	7,9	<i>9,1</i>	11,9	11,7	3,1	<i>4,5</i>
Non-durable goods	23,4	22,6	10,4	<i>12,5</i>	11,8	<i>12,9</i>	3,3	<i>4,3</i>
Semi-durable goods	15,0	11,4	7,8	6,0	10,1	7,4	4,3	7,2
Durable goods	13,9	<i>14,3</i>	7,4	6,1	14,3	11,3	2,7	3,6
Capital goods	19,7	<i>19,9</i>	12,3	<i>13,5</i>	6,2	6,2	2,7	<i>6,6</i>
Total services	35,4	33,5	17,6	15,7	17,7	16,0	4,0	3,6
Consumer services	33,8	31,5	19,3	16,3	16,1	13,7	5,5	3,5
Government services	38,1	36,0	18,3	16,8	20,7	19,5	2,8	<i>4,5</i>
Collective services	36,1	33,6	17,6	15,2	18,9	17,5	4,2	<i>5,0</i>
Individual services	39,6	37,7	19,3	18,6	22,6	21,5	1,8	<i>4,3</i>

Note: The standard deviation of levels (EU-25=100%). NMS-10 = New Member States. NMS-4 = the Czech Republic, Hungary, Poland and Slovakia. The number in 2004 is in italics, if the standard deviation is higher than in 2000.

Source: EUROSTAT, Economy and Finance, Prices (28th of April, 2006), own calculation.

The analysis on disaggregated level is concluded by the role of government services. Figure 8 offers surprising view on the role of government services in the CPL analysis. The CPL for government is the highest relatively to consumer services in the Czech Republic, Hungary and Slovakia in 2000 and 2004. These three countries have also the lowest CPL for GDP and actual individual consumption in comparison with GDP per capita in PPS. The solution of this paradox is beyond the scope of this analysis, but we offer the possible explanation through the regulated prices in next section.

Figure 8: Relative CPL of Government and Consumer Services with Total Services CPL in 2000 (left) and 2004 (right)



Note: Luxembourg is omitted.

Source: EUROSTAT, Economy and Finance, Prices (28th of April, 2006), own calculation.

3.3 Why are the differences in the case of the CR so significant?

Price adjustment in an open economy is determined to a significant extent by autonomous factors whose strength arises from the share of administered prices in the relevant economy. Development of the price level therefore needs to be considered in the context of price differences between tradable and non-tradable assets and in the context of regulated items.

Prices of tradable assets are regulated in principle by international competition and the influence of domestic conditions is relatively insignificant. Prices of some of these commodities may be at an international level, while other prices may be above or below this level.²³ Therefore, their development may be influenced by many other factors and these prices may not change much although different movement arising from price divergence will be observed in other prices. It is important that the price convergence displays differentiated development in principle reflecting different development in tradable and non-tradable groups (or subgroups) of assets, inputs and outputs because only then the competitiveness of domestic producers can be sustained on a long-term basis.

Non-tradable assets have a price low level arising from the past conditions and this level grows very slowly as the economic standard and the wage level increases. This growth should not be irrespective of development in the labour productivity as this could lead to consequences identical to those experienced currently by the states of the former East Germany. Long-term adjustment process can be expected and it is impossible to reasonably predict that the CR will successfully reach a level similar to that of other EU countries. After all, even other EU countries display significant deviations in this area many years after their accession.

Different shares of regulated prices in EU-8 countries may also be partially responsible for the observed situation. The CR and Slovakia are currently the two countries with the highest share of regulated prices in the consumer basket for inflation calculation (see table 4). Although this consumer basket is different from values of these items in the national accounts, it can be seen as certain approximation of the actual values, given that the distortion will not be very significant (considering the consumer basket structure based on selective identification of household consumption).

Table 4: The composition of consumer basket in the HICP

Total index = 1000	CZ	EE	HU	LT	LV	PL	SI	SK
Regulated prices	250,5	178,0	200,6	171,3	205,9	206,0	166,9	258,2
Other prices	749,5	822,0	799,4	828,7	794,1	794,0	833,1	741,8

Source: WB, 2006, s. 12, own adaptation.

²³ In the CR this is the case for example in the prices of clothes in 2003 (CPL index = 105), 8th place above the EU level shared with Cyprus; while other EU-10 countries are below the EU level (see EUROSTAT, 2005a). On the other hand, the local prices of passenger cars for 2004 were below the EU level (CPL index = 90), Hungary recorded a somewhat higher level (97); while lower levels were observed in Slovakia (88) and Poland (82) (see EUROSTAT, 2006a).

The shares of administered items in national consumer baskets for CPI calculation differ significantly among individual new member states – for example in 2004 from a few percent (Poland) to tens of percent (Estonia) see table 5.

Table 5: The share of administered prices in the CPI (in %)

	CZ	EE	HU	LT	LV	PL	SI	SK
1998	13,3	25,6	17,0	16,9	20,4	10,6	17,0	17,8
1999	13,3	25,6	18,2	22,0	16,2	9,0	14,3	17,8
2000	13,3	25,6	18,3	22,3	18,1	2,6	13,7	17,8
2001	12,4	28,9	18,5	22,0	20,4	1,2	13,2	17,8
2002	12,4	28,5	18,9	20,7	21,5	1,0	14,0	21,1
2003	10,9	24,9	19,4	16,3	23,5	1,0	15,4	20,7
2004	10,9	26,9	17,9	16,0	19,8	1,0	16,1	19,9
2005	10,9	26,7	17,0	14,3	<i>na</i>	1,2	16,7	<i>na</i>

Note: EE – the high share is due to including of gasoline into basket.

Source: EBRD, 2004, 2005.

However, other reasons for the significant divergence of the price level in the CR are suggested (see Skořepa, 2001; Čihák, Holub, 2001):

- a) Statistical deception (associated with international comparisons where completely identical items may not exist in the compared countries, in particular clothing can be used as a good example of this phenomenon);
- b) Tax burden (indirect taxes, whether general or selective, influence potential commodity arbitration);
- c) Arbitration rate (not a temporary price difference);
- d) Arbitration cost (relate to obstacles to arbitration between countries);
- e) Monopolist competition on markets with tradable assets (sophisticated products with emphasis on their quality rather than price);²⁴
- f) Impact of the population's economic activity (this value for the CR is higher than in other new member states and most of the old EU members);²⁵
- g) Prices of food have not been influenced by the EU agricultural policy (minimum prices, volume regulation, *etc.*) but instead were influenced by a strong pressure of retail chains over the last few years.

Pointing out some other related circumstances is appropriate in this context. The price growth in the CR will clearly need to increase its dynamics because the current very significant (although decreasing over time, see Čihák, Holub, 2001) negative divergence is not sustainable on a long-term basis in the case of “regular” development of the economy. Since the growth rate of prices in the tradable sector is lower than that in the non-tradable sector (B-S effect), the price growth will be influenced in particular by the following factors (comp. Janáčková, 1999):

²⁴ Lower quality of products would lead to compensatory pressure on export prices depending on demand elasticity.

²⁵ Productivity of the negotiable assets sector is reflected in GDP per worker rather than GDP per capita. Distorted results are generated in the case of different levels of activity in the use of GDP per capita. Relative productivity of the non-negotiable assets sector represents the second factor. Relatively higher productivity decreases unit costs in the negotiable sector and the overall price level.

- a) Growth in the labour productivity for tradable and non-tradable assets (the so-called dynamic B-S effect, see Skořepa, 2001);
- b) Difference between the growth rates of productivity in both sectors of the Czech economy;
- c) Opportunities and especially the strength of wage adjusting factors in both sectors of the economy. (The strength of pressures in the non-tradable sector so far seems to produce an increase in wages exceeding the labour productivity and this ensures the theoretically expected catching up in wages. However, it is impossible to predict how long this process will last.)

Growth of the economic level in the relevant country leading to changes in the consumer demand structure towards a higher share of non-tradable assets has a very different impact.²⁶ The price elasticity in the case of these assets tends to be higher and this ultimately leads to a faster growth in prices.

Another possible explanation is linked to the specific situation within the EU (see Canzoneri at al., 1996), where the process of creating a joint market resulted in increased competition in the tradable assets sector. In many cases labour has shifted to the non-tradable assets sector (especially state sector and services), which provides greater protection and barriers against competitive pressures. The growth of this part of the economy has led to higher wage and price growth in countries with higher economic levels.²⁷

The price development (nominal convergence) in the CR is estimated as a long-term process similarly to real convergence. However, if the rate remains stable, the sector producing non-tradable assets will create positive inflation differential and its extent will depend greatly on development in the prices of tradable assets. Moving from the macroeconomic level to a more detailed structure of asset groups (individual items) and assessing the structure of their relative prices and their changes in time would be necessary for a more in-depth analysis. This was the case in the results of the international comparison for the period from 1996 to 1999 (see for example Čihák, Holub, 2001); no study has so far published similar results for 2002.

3.4 Open issues

Groups of countries with inflation differentials higher than the Eurozone average (not only countries at a lower economic level – Mediterranean countries – but also Ireland or the Netherlands), as well as countries with inflation rates below this level exist within the EU. States with higher inflation rates also recorded higher growth rates. Their low price levels are therefore associated with the risk of increased inflation (as was the case for example in Mediterranean countries which compensated price differentials with a fixed rate arising from different growth rates of productivity in this manner). If this development was to continue on a long-term basis,

²⁶ This fact arises from the microeconomic theory of the well-known Engel curve.

²⁷ The planned change in the conditions for conducting business in the services sector within the EU (the so-called Bolkenstein's directive) should ensure a higher level of competition in this sector. However, the proposed changes have significantly weakened the original intentions and no significant increase in competition in the services sector (or a higher level of negotiability) can therefore be expected.

ECB or ECOFIN can be expected to request that the limit determined by the Maastricht criteria be observed. Experience of certain countries suggests potential danger of holding back the economic growth associated with anti-inflation stabilising policies applied in these countries.²⁸

EU countries with lower economic levels (or significant structural changes) listed in table 6 can be used as an example. Except for Greece, which did not join the Eurozone in 1999 with the other 11 countries and strived to meet the Maastricht criteria, all other countries displayed a higher price growth during 1999–2001 than during the previous stage (1996–1998) with a decreased GDP growth rate (except for the above-mentioned Greece and Spain). This higher growth of prices persisted even in the following period (2002–2004), although the lower growth dynamics during this period were influenced by a number of adverse external factors.

Table 6: Differences in HICP and GDP before and after entry into the Euro area (annual percentage changes)

	Before entering the euro area		euro area					
	1996–1998		1999–2001		2002–2004		2005	
	HICP	HDP	HICP	HDP	HICP	HDP	HICP	HDP ¹⁾
Ireland	1,8	9,5	3,9	8,7	3,7	5,0	2,2	4,5
Netherlands	1,7	3,7	3,1	8,0	2,5	0,6	1,5	1,7
Portugal	2,3	4,2	3,1	3,2	3,2	0,2	2,1	1,2
Greece	5,9	3,1	2,9	4,2	3,4	4,4	3,5	4,7
Spain	2,4	3,6	2,8	4,4	3,3	2,9	3,4	3,1

Note:¹⁾ Estimate of EUROSTAT.

Source: Structural Indicators, EUROSTAT, 2006b, own calculations.

Experience of countries that became EU members during the 1980s and 1990s may prove very practical in this case. This applies especially to the Mediterranean countries (Portugal, Greece and Spain), which had comparable real (and nominal) levels upon their accession to the EU to that of the CR. These countries experienced dynamic development before and after their accession. Experience of countries that became members of the Community in the 1980s is very useful to the current new member states from a number of aspects (the course, progress, reactions of entities, *etc.*). Ireland could also be considered as a country at an identical level upon accession to the Community. However, this country does not match the selected examples due to its specific characteristics (language, location, *etc.*) and therefore will be excluded from this consideration; states involved in the previous wave of extension in 1995 will also be excluded.

Even other countries differ from the current new EU-8 states, to be more specific Portugal due to its history of an industrially and agriculturally backward country, Greece influenced by the prolonged unrest in the country (and once again a large share of agriculture in the national economy) and Spain as a country coming out of a prolonged period of an authoritarian regime. However, Spain's economic level and structure is significantly closer to the current one and therefore the most significant for our purposes.

The overall price level (GDP) of Portugal at the time of its accession to the EC was around 55% (1986) of the average level at the time (EC-10) and in 1996 approximately 70% (goods

²⁸ The disinflation process is connected with loss of product (although the growth rates may be positive) in respect of the potential product. It is therefore possible to conclude a static and dynamic sacrifice ratio of this disinflation process for the relevant economy.

and services for individual consumption increased from 60% to 74% in the same period). During the same period, Spain recorded a lower rate of growth from 76.9% to 85% of the average level, while Greece practically stagnated from 83.3 % (1981) to 80%.²⁹ Nominal convergence of these countries gradually adjusted and has been at a level equal to the economic level on a long-term basis (no significant divergences are observed). However, a more detailed structure of price relations and the adjustment process as such has not been and will not be completed for quite some time.³⁰

Real exchange rate

Low level of inflation accompanied by a significant rate of the exchange rate appreciation is currently typical for the economy in the Czech Republic (and Poland). The most comprehensive illustration of the impact of the inflation and exchange rate differential on competitiveness of the relevant economy is reflected in the so-called real effective exchange rate (REER).³¹ This issue is addressed in more detail for example in Frait, Komárek (2004). While inflation can be transferred to most entities in the economy, exchange rate appreciation has a significant impact on exporters and importers. This situation is positive for importers as it allows them to compete with local companies. However, exchange rate appreciation presents a major problem for entities exporting to markets abroad without imported assets for the relevant commodity. However, the currency issue and the share of commodities with imported inputs in the overall produced assets are vital also for companies using imported inputs. Čech, Komárek (2005) in this context describe a serious phenomenon referred to as exchange-rate hysteresis, which means that significant currency appreciation can result in failure of certain companies (changes in the industry) but potential subsequent currency depreciation to the original level may not guarantee renewal of the original activities.

In the case of accession to a monetary union (or in the case of a fixed exchange rate, the so-called central parity within ERM II) the exchange rate channel is virtually unusable for exchange rate depreciation (currency appreciation is in principle possible and due to the exchange rate criterion asymmetry is not as binding).³² Incorrectly or unsuitably set conversion ratio of the domestic currency to Euro could lead to problems that can be observed currently for example in Germany (overrated exchange rate and the resulting shock) or on the other hand to a

²⁹ Numbers vary depending on the method of constructing the average for all countries during the relevant period (EC-10 or EC-12). This is why these values must be considered only approximate price level indicators. See for example Janáčková (1999, 2000), EC (2003), Nestić (2005).

³⁰ In order to examine this issue in greater detail, development of individual items in the main consumption groups would need to be monitored and tested.

³¹ According to EUROSTAT data, the real effective exchange rate for the CR for 2005 (index 1999 = 100) is 137.3 (year-on-year change of + 7.9 %), which is the second highest value after Hungary (144.9, change of + 0.5) and before Slovakia with a value of 134.6 (change of + 6.6, see EUROSTAT, 2006b).

³² Interpretation of the exchange rate criterion is very complex and it is not clear as yet which rules apply – whether the original range ± 2.25 % or $+ 15$ % / $- 2.25$ %, or the broadest version applied by many countries after the black autumn in ERM in September 1992, i.e. ± 15 %. This level was used by Dědek (2002), currently the concept of a narrow range of ± 2.25 % prevails with the assumption that exchange rate appreciation or exchange rate adjustment in this direction practically is not a problem, while short-term depreciation below the 2.25 % level is considered and assessment is not clear (see Čech, Komárek, 2002a; Čech, Komárek, 2002b), comp. Dobrinsky (2006).

“positive” cyclical fluctuation. Neither of the options is desirable and this is why the issue of determining parity is perhaps the most important problem to be solved.

Balassa-Samuelson effect

The impact of B-S effect needs to be considered for closer explanation of the difference between price levels of individual countries. The aggregate price and economic level needs to be decomposed (*i. e.* sectors need to be considered) in order to facilitate assessment of the B-S effect. As Balassa (1964) and Samuelson (1964) have previously shown, different levels of labour productivity between sectors in individual countries are reflected in their price levels. A higher level of productivity in a tradable sector compared to a non-tradable sector reflects in a higher price level of the economy as a whole. If the law of one price holds for tradable sector, formal expression on this relationship produces the following equation³³

$$CPL = \left(\frac{A_T}{A_{NT}} \right)^{1-\delta} \bigg/ \left(\frac{A_T^*}{A_{NT}^*} \right)^{1-\delta^*}, \quad (1)$$

where CPL is comparative price level, A_T (A_{NT}) is productivity level in tradable (nontradable) sector, asterisk denotes foreign country and parameter δ is estimate of the share of tradable goods in consumption.

After rearranging of equation (1) into growth rates and taking into account that the change in CPL is the inversed change in real exchange rate, it's possible to obtain the following equation in logarithm form

$$\Delta cpl = \Delta p - \Delta p^* - \Delta e = (1 - \delta)(\Delta a_T - \Delta a_{NT}) - (1 - \delta^*)(\Delta a_T^* - \Delta a_{NT}^*) - \Delta e, \quad (2)$$

where Δ denotes first differences and e is nominal exchange rate. B-S effect on the CPL development is clear from equation (2). The higher will be the differences of labour productivity in the tradable sectors in new member states without the differences in the non-tradable sectors, the higher inflation differentials will be in these countries.

The assumed level of the B-S effect for the new EU countries is estimated at 2% (stated in Frait, Komárek, 2004 quoting Kovács), for current estimates (depending on the calculation method) see Égert (2003, 2006). On the other hand, Mihaljek, Klau (2003) estimated the impact of the B-S effect at 0.1-2.0% per year for the EU-10 countries (growth in productivity is a small factor for the price differentials of the EU-10 countries in respect of the Eurozone).

The B-S effect is a tool for explaining the differences in price levels but its prediction capacity is lower compared to real income (which, however, is influenced by a range of factors influencing the price level). Also the B-S effect can be diminished by the changes in the employment and the mark-up at the sectoral level, what can be also obscured by the structural changes in the new Member States.

³³ This relationship is frequently tested for the case of growth rates of the price level and the productivity differential (a higher differential leads to a higher inflation rate); see for example ECB (1999).

Path to the Eurozone

The following few years will be marked especially by the effort to gradually meet the Maastricht convergence criteria. This will be very demanding for stabilising policies. Both, real and nominal convergence of the economy should continue. An acceptable solution that will not jeopardize competitiveness of the corporate sector, while supporting real convergence needs to be sought in respect of nominal convergence.

A number of options exist, considering development of the exchange rate and the price level. The influence of the exchange rate channel will weaken during the stage when the currency exchange rate is fixed as part of the ERM II mechanism. Meeting the Maastricht criteria with regard to inflation will have a different impact on countries with a fixed exchange rate (for whom this will de facto mean free movement within the zone) from countries with a flexible exchange rate (for whom the exchange rate will be fixed in ERM II zones).³⁴

In the case of the Czech economy the exchange rate channel appears to be very significant. However, we need to consider that the exchange rate is influenced on a short and medium-term basis by a range of factors (arrival of investment, expectations, *etc.*). In a liberalised environment, these capital flows are to a certain extent independent of the actually occurring real economic processes.

Positive consequences will be associated with a reduction of interest rates in countries with levels higher than the level in the Eurozone (Slovakia, Baltic States) for the corporate and public sectors (Spain can be used as an example). On the other hand, countries with a stable price development such as the CR will gain no advantage from this aspect.

The EU-10 will face great challenges in the fiscal area. Relatively strict criteria for the level of deficit and public debt are in place on one side, while on the other side the convergence process forces these countries to make significant investments financed from public resources. Overcoming this conflict is not easy and potential use of private resources (PPP type) cannot solve a potential lack of resources.

4. Conclusion

After the fall at the beginning of the 1990s, economies of the EU-8 countries gained significant dynamics, which allowed them to renew the real convergence process. Some of the countries did not manage to avoid certain deceleration in the mid 1990s or at the turn of the century. The Czech Republic holds one of the leading positions (after Slovenia) regarding GDP per capita in the purchasing power parity and the first place among the EU-8 countries in the real convergence rate during 2000–2005.

Securing relatively smooth progress of the convergence process requires harmonised progress of convergence of real and nominal values. However, a number of unsolved issues remain in

³⁴ One of the options is modifying the convergence criteria for countries with a fixed exchange rate regime (a higher inflation rate limit) and for countries with a flexible exchange rate regime, as suggested by Dobrinsky (2006). In the case of the inflation criterion differentiation between benign inflation arising from growth of productivity and malign inflation caused by policies should be introduced.

the area of nominal convergence and these issues will need to be solved in a satisfactory manner sooner or later (the impact of B-S effect, *etc.*). Their significance will increase with the approaching date of accession to the Eurozone.

The significant divergence of the price level in the economy from the value expected in respect of the achieved economic level in the CR represents a major potential problem for the Czech economy. A number of factors that may influence this status have been mentioned in this paper as the frequently discussed issue of price regulation is not sufficient. This fact is a relatively serious economic problem not only for the present times but especially for future development of the economy as a whole. The price level of the Czech economy will continue to grow over the next few years not only owing to the inflation differential and the exchange rate, but also due to spontaneous processes. The price level growth will result from growing labour productivity and real income, and the convergence tendency in consumer habits.

The disaggregated approach to comparative price level indexes revealed important consequences. The most often used regression in the real and nominal convergence process shows the slope of comparative prices level to GDP per capita in PPS near 0.8-0.9. If we do disaggregated approach, we get absolutely different results. The expected real convergence process will cause the increase in comparative prices level through the price increase in services, where the slope to GDP per capita is higher than in comparative price level for total goods.

If the nominal convergence process continues to occur through changes in the exchange rate rather than changes in the price level, significant changes in the exchange rate reflecting improved competitiveness of some companies in our economy can be expected to pose threat to other export companies (industries). This would lead to problems with the current account of the payment balance and the subsequent exchange rate turbulence with potential opposite effect – price level divergence.

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