3. Nominal and real convergence of the CR towards the European Economic and Monetary Union

The Czech Republic, according to the results for 2004 and the currently analysed period (April 2004 to March 2005), is the only country from among the CR, Hungary, Poland and Slovakia which meets three out of four criteria prescribed by the Maastricht Treaty for nominal economic convergence towards the Economic and Monetary Union in Europe. Besides the still fragile success in the fiscal area, the CR has a high level of price stability and relative stability of convergence according to the level of long-term interest rates. The meeting of the fourth criterion for nominal convergence, the monetary stability criterion, can be formally assessed only after the CR joins ERM II and after the central exchange rate parity CZK/EUR is set. At the moment, the volatility of the CZK/EUR exchange rate according to deviation from the average exchange rate is considerably lower than the standard band of participation in ERM II, but higher than the narrow band decisive for meeting this criterion.

The stress put on meeting the Maastricht criteria brought about better results for the CR in terms of nominal convergence in the long term than for the other central-European countries, but not in terms of real convergence. According to analysis contained in this chapter, economic development of the CR between 1997 and 2004 was slower than in Hungary, Poland and Slovakia. Moreover, the average annual rate of growth was lower than that in the EU15. GDP per capita related to the EU25 average was even falling in 1997-2000. Compared to the other central-European economies, the CR achieved a substantially weaker improvement in terms of hourly labour productivity and productivity per employee. Relatively faster is the convergence of price levels.

3.1. Nominal convergence

Price stability criterion

- ***Maastricht criteria for nominal convergence in the area of prices***

Article 121(1) of the Maastricht Treaty describes price stability as level of inflation rate that is close to inflation rate in three EU member states that have reached the best results in this respect[1]. For the purpose of this criterion, inflation rate is measured by the Harmonised Index of Consumer Prices (HICP) which compares the average price level in last 12 months with the average price level in 12 preceding months.

- ***The CR meets the price stability criterion in the long term – roughly half countries outside the EMU have difficulties meeting it***

According to the HICP, the Czech Republic reached in 2002-2005 price increases that were well below the reference value calculated according to the convergence criterion. In the reference period, for which latest data with regard to this analysis are available, inflation rate reached 2.4%, which was below the reference value calculated according to the Maastricht rules, i.e. 3.7% in April 2004 to March 2005 (non-weighted arithmetic mean of three states with the lowest inflation – Denmark, Finland and Sweden – raised by 1.5 percentage points).

The convergence criteria were not met by Hungary, Poland and Slovakia, further by Estonia and Latvia. The average was 2.2% for the EU25, 2% for the EU15 and 2.1 for the whole EU (however, this indicator is not relevant for meeting convergence criteria).

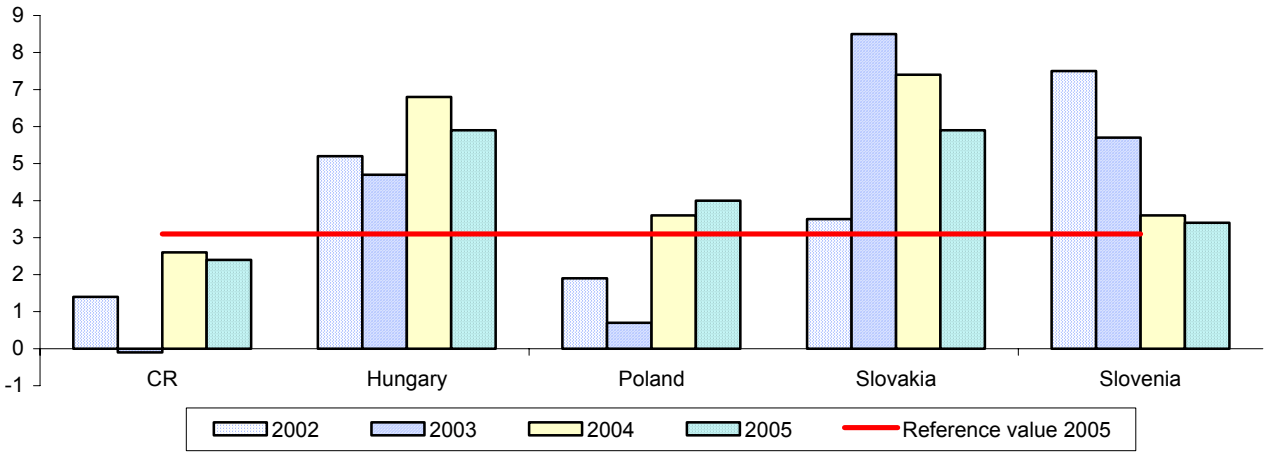
- ***At the end of 2004, price stability criterion was not met by 6 out of 11 European states which did not yet adopted the single currency***

Also calculations for the end of 2004 show that the CR reached inflation rate 2.6%, against the reference value of 3.1%. It means that the convergence criterion was met. However, all the other new central-European newcomers and Slovenia, further Latvia and Luxembourg, failed to meet the conditions of the Maastricht Treaty concerning price stability. Spain was on the margin of the reference value for price stability at the end of 2004. Slovakia (7.4%) and Hungary (6.8%) faced the biggest difficulties meeting this criterion. Most of the 11 EU member states that have not yet adopted the single currency had a problem meeting the price stability criterion at the end of the year. On the other hand, the CR, Cyprus, Lithuania, Malta and Sweden met this criterion. The average made up 2.1% for the EU25, 2% for the EU15 and 2% for the whole EU.

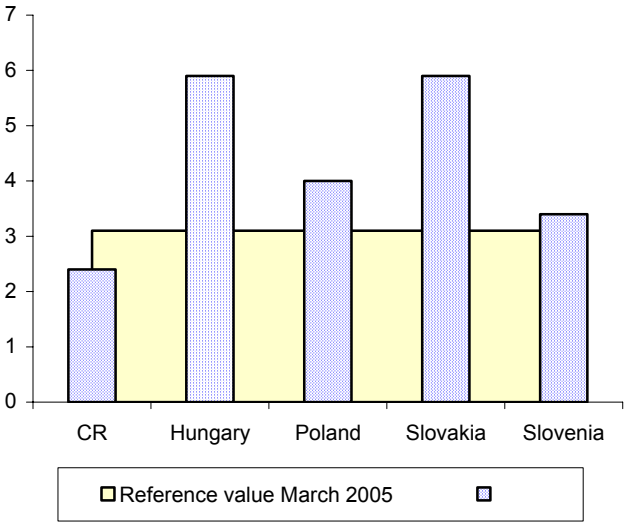
[1] The member state must maintain long-term price stability and average inflation rate measured during one year before the survey which does not exceed by more than 1.5 percentage points inflation rate in three member states with the best results.

Note: Eurostat databases and calculations by the CZSO are sources of all the data for graphs in this chapter.

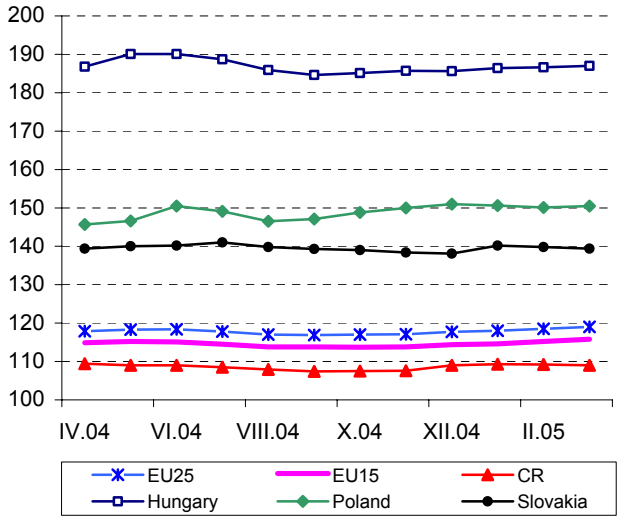
Graph 2 **Price stability according to the convergence criterion of the Maastricht Agreement: inflation rate** (HICP, percentage change – 12-month average, reference value 2005)



Graph 3 **Nominal convergence – inflation rate, selected countries** (HICP, March 2005, %)



Graph 4 **Inflation rate in the Food item** (HICP, 1996=100)

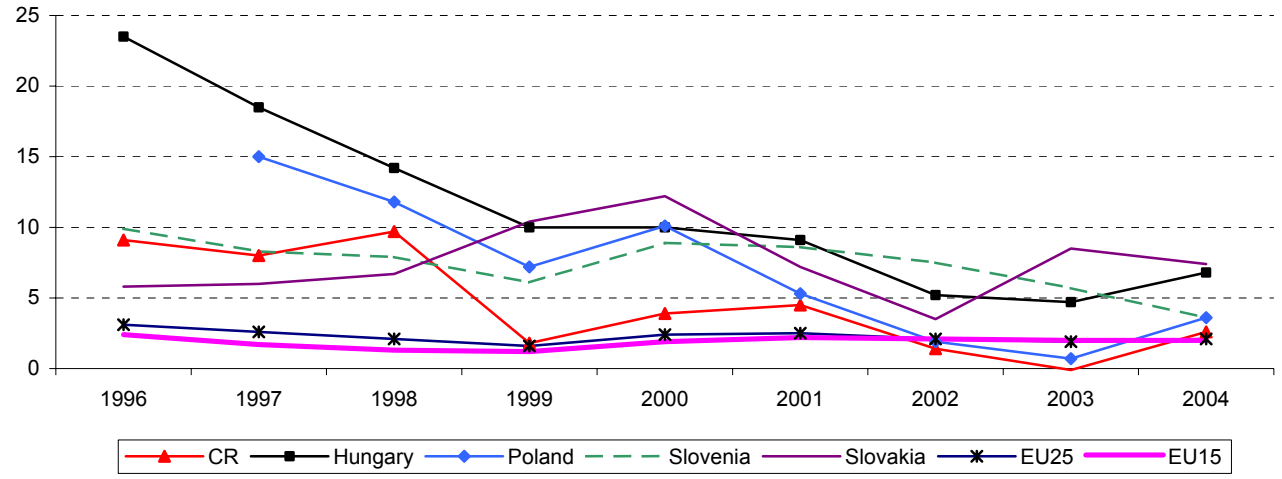


- ***Compared to 1996, prices in the CR according to HICP grew by 37.2%, i.e. less than in any other central-European country joining the EU***

The Czech Republic maintains a low inflation rate also in the long term. The Harmonised Index of Consumer Prices in March 2005 shows an increase of 37.2% on 1996, which was the lowest increase in comparison to all the other central European countries that joined the EU in May 2004. Compared to 1996, prices in Hungary grew by 115.4%, in Slovakia by 84.6%, in Slovenia by 76.1% and in Poland by 72.3%. Lower increases among the newcomers to the EU were observed only in Lithuania, Cyprus and Malta.

In spite of a better result in curbing inflation than in most new member states, the price increase in the Czech Republic was higher than in the European Union. The EU25 recorded a 20.5% increase since 1996 and the old EU member states 16.9%. Prices in the EU rose by 17% in total, which amounts to an average annual change in the Harmonised Index of 2.1%. The average annual change in the HICP in the CR stood at 4.4%. However, prices in Hungary grew by 14.4% a year on average.

Graph 5 **Harmonized index of consumer prices – average y-o-y change** (%)



- ***Low inflation rate in the CR is reported particularly for the item of Food***

Prices of food are beyond the reach of monetary policy. The CR recorded only a 9.1% increase in the price level of food (according to the Harmonised Index) between 1996 and March 2005. This was the lowest rise among the countries observed and lower than the averages for the EU25 (+19%) and for the old EU member states (+15.8%). A huge growth of food prices is reported for Hungary where the price level grew by 87% compared to 1996, which was a nearly ten times higher increase than in the Czech Republic. Considerably higher were also price increases in Poland and Slovakia (50.5% and 39.4%, respectively). Over the same period, the price level of food in Slovenia went up by 60.6%. Among the EU member states, lower increases in food prices in last roughly eight years were recorded only in Germany (6.6%) and Lithuania (4.4%). Food prices in Great Britain saw about the same increase as in the CR.

Fiscal stability criterion

Public budget deficit

- ***The Czech Republic surprisingly met the limit of fiscal stability criterion for 2004…***

The Czech Republic markedly reduced its public budget deficit in 2004. By doing so, the CR thus actually met the last of the Maastricht criteria of nominal convergence for 2004, which lays down the duty of the EU member states to observe the prescribed limit. According to the Growth and Stability Pact, the public budget deficit[2] of a given country must not exceed the level of 3% of GDP considered as the public budget stability line.

Not only the CR, but also the Euro-zone, recorded a slight improvement of their budgetary deficits in 2004, compared to economic performance. The Czech Republic achieved the biggest improvement. As shown in Graph 6, deficits in Slovakia, Hungary and Poland stood at 3.3%, 4.5% and 4.8%, respectively. Deficit in Slovenia in 2004 was only 1.9% of GDP.

- ***… thanks to a lower recorded deficit of the state budget, transfer of unspent resources to reserves and reclassification of guarantees***

According to Eurostat, public budget deficit in the CR was as high as 11.7% of GDP in 2003. A considerably better result for 2004 was due to several factors – in the first place, however, a lower deficit of central government, i.e. of the state budget and extra budgetary funds:

- lower deficit calculated according to ESA 95 methodology resulted from the fact that the recorded deficit of the state budget reached CZK 93.5 billion, which was by CZK 21.4 billion less than the annual budgeted level;

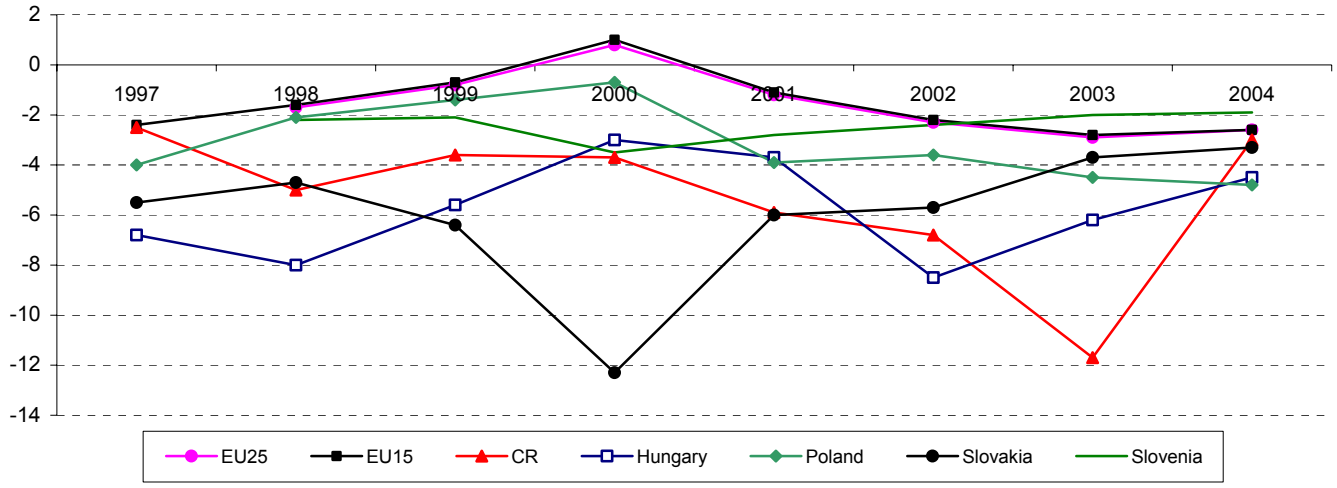
- of some effect were new budgetary rules that made possible the transfer of unspent

[2] According to the Maastricht Treaty (Protocol on the Excessive Deficit Procedure), budgetary deficit (surplus) is net loan of the whole government sector (central government, state government, local government and the social security system). Primary surplus is budgetary deficit/surplus excl. interest charges (consolidated).

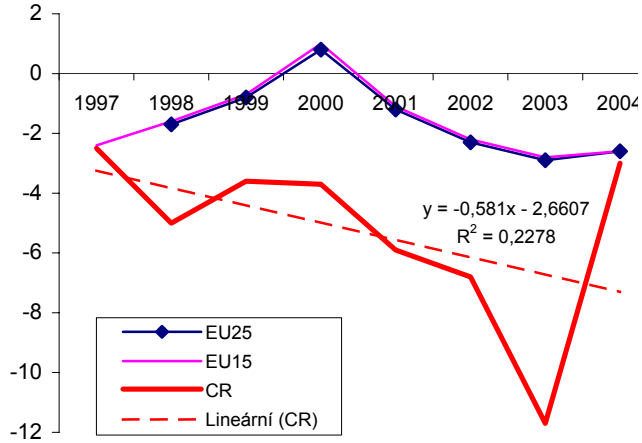
resources to reserve funds (CZK 25.8 billion), which improved government deficit. At the same time, uncollectible claims against highly indebted foreign countries were written off (remitted claims amounting to CZK 18.7 billion deteriorated the balance of the government sector by the same amount);

- based on a recommendation by Eurostat and in contrast to the updated Convergence Programme, a guarantee of CZK 22.5 billion was reclassified in favour of the Czech National Bank. This guarantee was previously recorded in form of a capital transfer with the full impact on government deficit and government debt in 2004 – in contrast to the Convergence Programme, this amount was subtracted from government deficit in 2004 because this guarantee was subsequently reclassified in the year 1997 when it came into being.

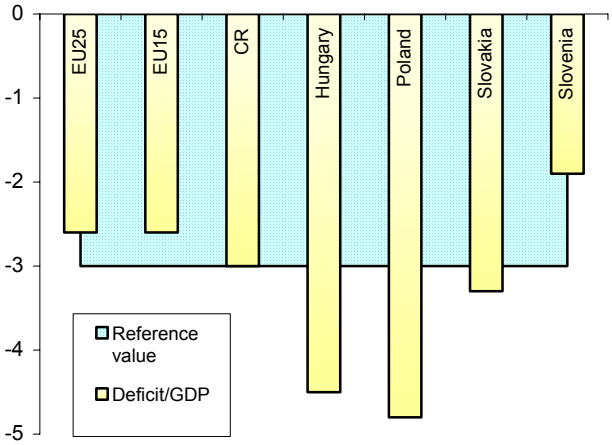
Graph 6 **Development of public budget deficits in relation to GDP for selected countries and the EU** (1997-2004, %)



Graph 7 **Development of the CR's public budget deficits in relation to GDP** (%)



Graph 8 **Public budget deficits in relation to GDP** (selected countries in 2004, %)



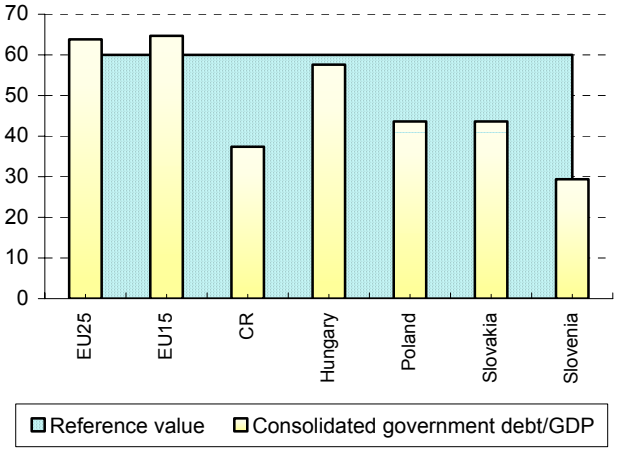
Government debt

- ***A low base of government debt***

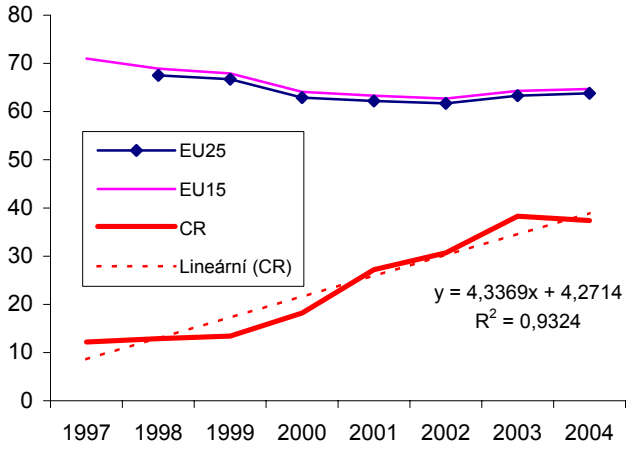
Consolidated government debt[3] related to GDP in the Czech Republic is at a level which represents no problem in terms of meeting the convergence criterion. Its sharp increase in 1999-2003 should be replaced by a stabilisation after budgets have been consolidated. A slight decrease in the share of government debt in GDP occurred already in 2004.

[3] Total gross debt of the general government sector according to ESA 95 in nominal value at the end of the year after consolidation, i.e. except liabilities corresponding to financial assets held by other government subsectors. It contains securities other than shares (e.g. treasury bills, state bonds) and loans (e.g. credits, repayable financial assistance).

Graph 9 **Consolidated government debt in relation to GDP in 2004** (selected countries, %)



Graph 10 **Development of the consolidated government debt to GDP ratio for the CR and the EU** (%)



- ***After five years of strong growth, government debt of the CR related to GDP stagnating for the first time in 2004***

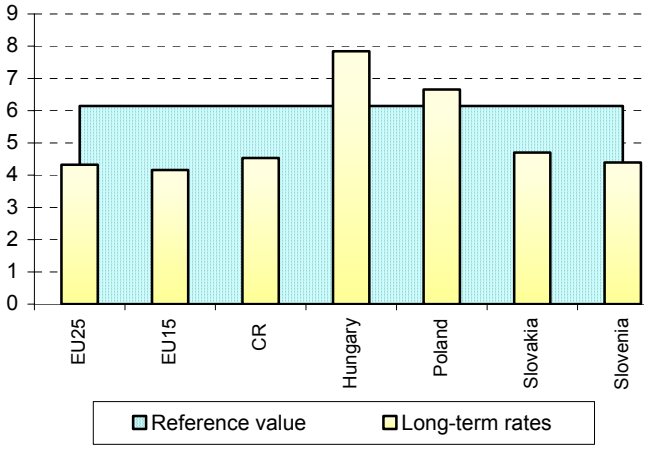
The member states of both EU25 and EU15 have substantially higher relative consolidated government debt than the central-European newcomers. The development of government debt in Hungary is in principal the same as in the EU, although at a lower level than the average for the Union. However, it is closely below the limit set by the Maastricht Treaty and Hungary is thus most endangered among the countries observed in this comparison. The lowest relative government debt is in Slovenia, while until 2001 it was the Czech Republic. The CR recorded the steepest growth of this relation up to 2003 which was followed by stagnation in 2004 due to the development of public budget deficit. Slovakia has been succeeding in reducing its relative government debt since 2000.

Interest rates convergence criterion

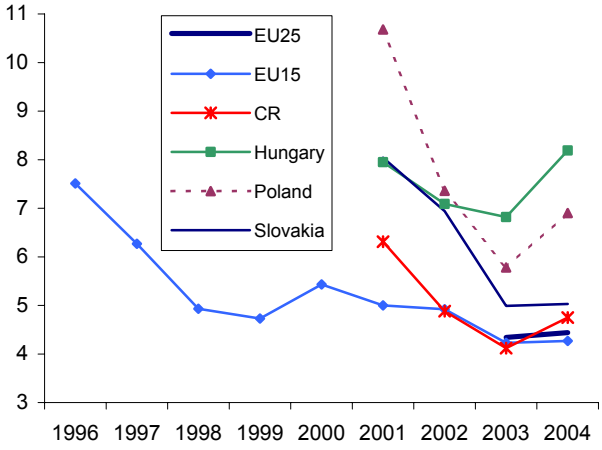
- ***Level of long-term interest rates is reflective of the convergence stability***

Article 121(1), the fourth indent of the Maastricht Treaty, says on the interest rates criterion that the stability of convergence reached by a member state and its participation in the mechanism of the European Monetary System is also reflected in the levels of long-term interest rates. It means that, during one year before the survey, the average long-term nominal interest rate in the country cannot exceed by more than 2 percentage points interest rate in at most three member states which achieved the best results in the area of price stability. As the reference value serve interest rates of long-term state bonds or comparable securities, taking into account different definitions of terms valid in individual member states.

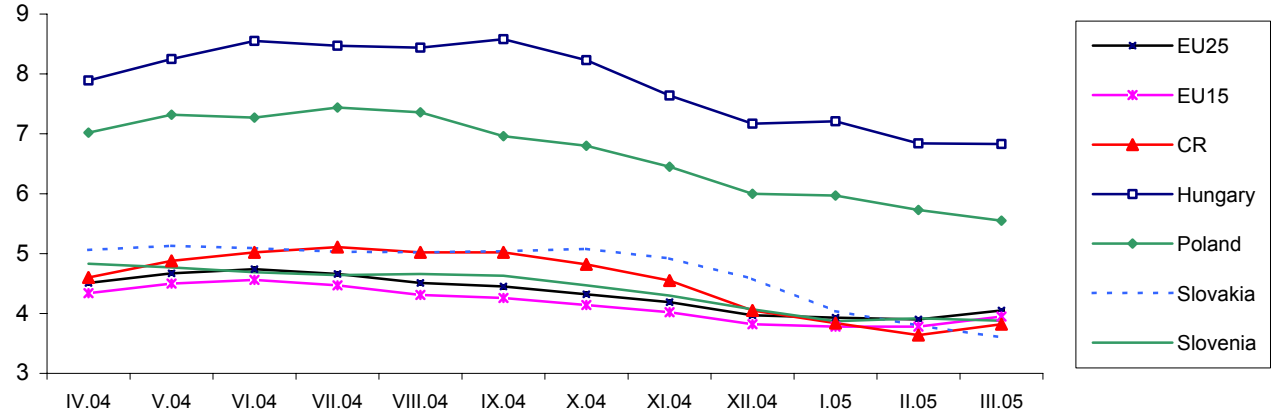
Graph 11 **Convergence criterion of long-term interest rates** (reference value 4/04-3/05, %)



Graph 12 **Development of long-term rates – yields of government bonds** (annual data, %)



Graph 13 **Convergence criterion of long-term interest rates – development of government bond yields** (monthly data, %)



- ***The Czech Republic has no problem of interest rates convergence also thanks to price stability***

The average long-term nominal interest rate in the Czech Republic amounting to 4.5% did not exceed the calculated reference value according to the Maastricht Treaty in the period observed in this chapter (April 2004 to March 2005). The Czech economy meets this convergence criterion sufficiently – the level of these annual interest rates in the CR was only slightly above the average for the EU25 and the EU15. While the Czech Republic had no problem meeting the convergence criterion in the period observed, calculations for Poland and particularly Hungary show difficulties. Average nominal interest rates in both countries were higher than the reference value in the period observed.

A stable decrease in long-term interest rates is apparent in the region (with stagnating tendency since the end of 2004). The fastest decreases were recorded for Poland and Hungary. Nevertheless, yields of long-term bonds are starting to grow in some countries with not a very good shape of budgets combined with inflationary pressures. However, long-term interest rates in the Czech Republic have been decreasing since the third quarter of 2004, so that the differential against yields of bonds in the EU was even negative.

Exchange rates stability criterion

- ***As central parity of the ERM II mechanism does not exist, deviation from average exchange rate against the euro illustrates exchange rate stability in the CR***

The exchange rates convergence criterion is one of the criteria for the introduction of the single currency (euro). Meeting the exchange rates stability criterion requires involvement in ERM II and maintenance of exchange rates stability. The standard fluctuation band is +/-15% against the central parity. The country must be in the ERM II system at least two years before the single currency adoption. However, the requirement of meeting the exchange rate criterion is stricter than mere sustaining in the standard fluctuation band – the country must keep its exchange rate in interval +/-2,25 % around the ERM II central parity „without a considerable strain". In other words, if the central bank of such a country maintains the exchange rate in this range with the help of excessive interventions or non-market measures, the exchange rate stability criterion is not met.

The CR is not yet in ERM II, is not subject to its mechanism and cannot maintain the fluctuation interval. Deviation from the average exchange rate against the *euro* is illustratively used for assessment of volatility of exchange rate of the *koruna* (however, it is impossible to be used for assessment of the appropriate level of exchange rate).

- ***The largest deviations from the CZK/EUR average exchange rate were +4,47% and -4,51% in 2004***

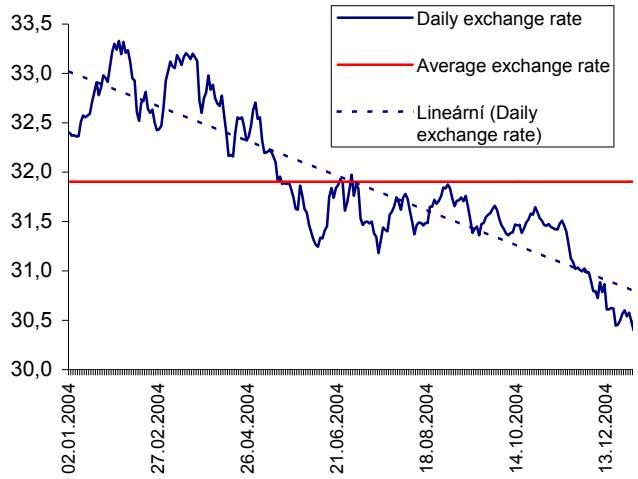
Development of the CZK/EUR exchange rate in 2004 was characterised by an appreciating trend. The *koruna* strengthened from 32.4 CZK/EUR at the beginning of the year to 30.465 on 31 December. The appreciation continued up to about the 10 March 2005 when the *koruna,* like other currencies, was affected by the quick withdrawal of investors from the region of central Europe (the Czech stock market, the Polish *zloty* and the Hungarian bond market underwent even deeper corrections).

The lowest value of the *koruna* against the *euro* in 2004 was recorded at the beginning of February (33.33 CZK/EUR), the highest at the end of December (30.465). These values deviate from the average exchange rate in 2004 by +4,47% and -4,51%.

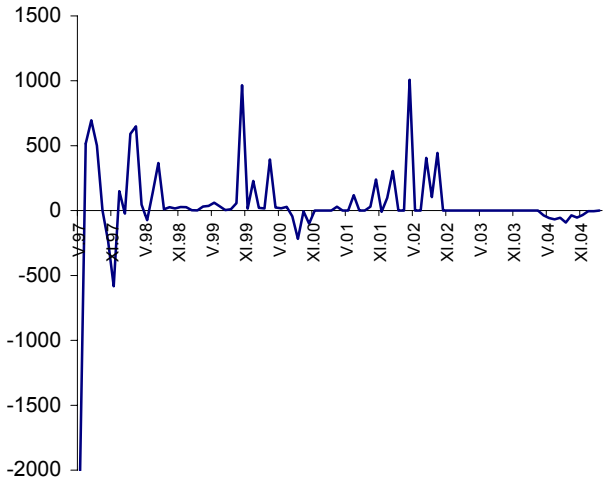
- ***Minimal interventions by CNB in 2004***

Meeting the exchange rate criterion with the requirement of maintaining exchange rate within a narrower interval against the ERM II central parity „without a considerable strain" is connected with interventions of the central bank. As Graph 15 shows, the CNB's foreign currency commerce according to spot transactions in *euros* was zero in 2003. There were several purchases of *korunas* in 2004, but their volumes were minimal. For illustration is mentioned the development of interventions in favour and against the *koruna* since 1997 with the dramatic development in the period of the "monetary crisis".

Graph 14 **Development of daily CZK/EUR exchange rates to average foreign currency exchange rate** (2004)



Graph 15 **Foreign currency commerce of the CNB – implemented spot transactions** (05/97-02/05, EUR mil.)



3.2. Real convergence

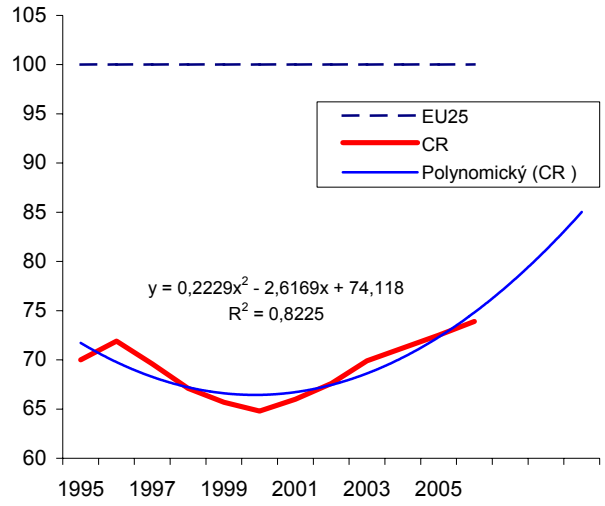
According to a Eurostat estimate, GDP per capita in the CR in 2004 was at 71.2% of the EU25 average

The results of convergence of the CR towards the EU level in terms of GDP per capita in 1995-2004 are not very convincing. According to an estimate by Eurostat, this indicator stood at 70% of the EU25 average in 1995 and 71.2% in 2004 – GDP per capita was 69.9% of the EU25 average in 2003, which was even less than in 1995. Just in 1995, the CR's GDP per capita was the highest among all the newcomers to the EU from central and eastern Europe. Two years later (in 1997), the Czech Republic was left behind by Slovenia. Although the rate of convergence in both countries has been roughly the same since 2001, GDP per capita in Slovenia related to the EU25 is still higher than that in the CR, which paid for the falling trend between 1996 and 2000.

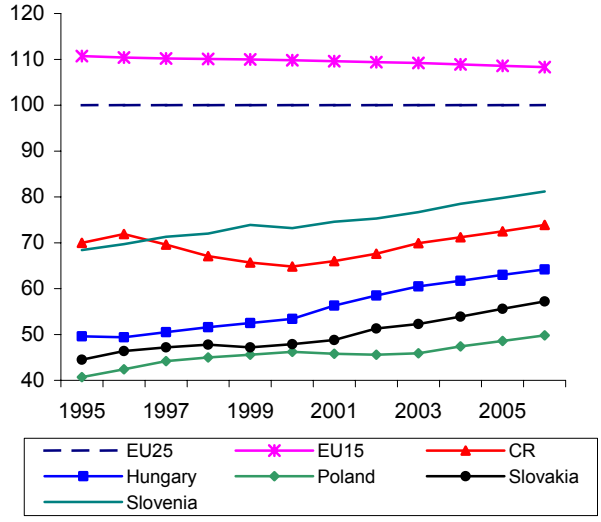
- ***The fastest convergence was in Hungary, the slowest in the CR***

In 2004, against 1995, GDP per capita in Hungary and Slovakia grew by 24.4 and 21.1 percentage points, respectively, in relation to the EU25 average. It means that the convergence in these two countries was fastest. However, their starting points were low – 49.9% of the EU25 average in Hungary and 44.5% in Slovakia. A lower relative GDP per capita in 1995 was reported only for Poland (40.7%) and this figure grew by 16.5 percentage points in 2004. Over the same period, Slovenia raised this indicator by 14.8 percentage points. The lowest rate of real convergence measured by the ratio of GDP per capita to the European average between 1995 and 2004 was in the Czech Republic (1.2 percentage points).

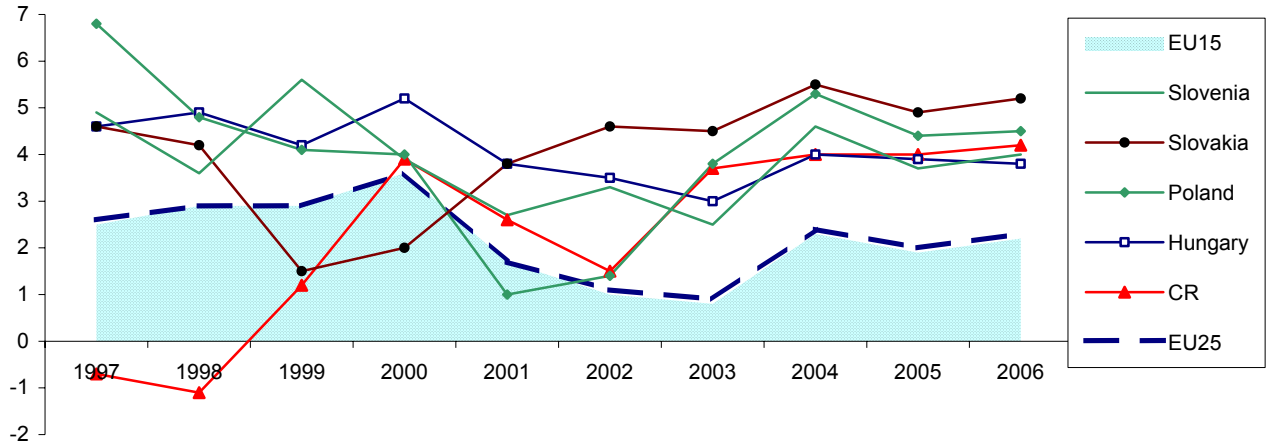
Graph 16 **GDP per capita in the CR according to PPS (**EU25=100; 2005 and 2006 – estimate by Eurostat; further regression analysis)



Graph 17 **GDP per capita in PPS** (EU25=100; selected countries; 2005 and 2006 – estimate by Eurostat)



Graph 18 **Y-o-y changes in GDP of selected countries at constant prices** (2005 and 2006 estimated by Eurostat, %)



Comparative price level

- ***Price level in the CR in 2003 was at 55.2% of the EU15 average***

A comparison of price levels[4] shows that the Czech Republic reached only 55.2% of the EU25 average in 2003. Nevertheless, according to an estimate by Eurostat, this level stood at 41.2% in 1995. These figures indicate a relatively high rate of convergence of price levels, in comparison to Slovenia, for example. Measured by this indicator, Slovenia is more expensive than the Czech Republic, but actually no convergence takes place there, if we compare price levels in 2003 (77.1% of the EU25 average) and in 1995 (77.1%). Although the price level in Slovenia related to the EU25 average did not change in the first and the last year of the given period, prices were decreasing on average throughout the period (i.e. convergence was negative).

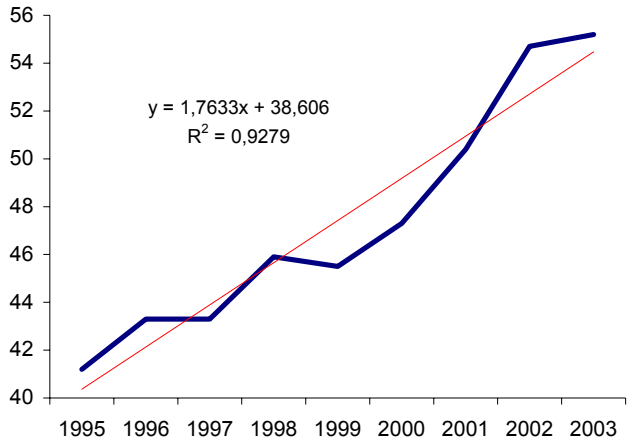
- ***Compared to the CR, higher relative price level is in Hungary and considerably higher in Slovenia where actually no convergence takes place***

A comparison of development of price levels in the Czech Republic shows that, according to a regression analysis, convergence has been faster since 2002 (the relative price level in last two years rose by nearly 5 percentage points); convergence was slower in 1998-2001 (the relative price level grew by less than 5 percentage points in the course of four years).

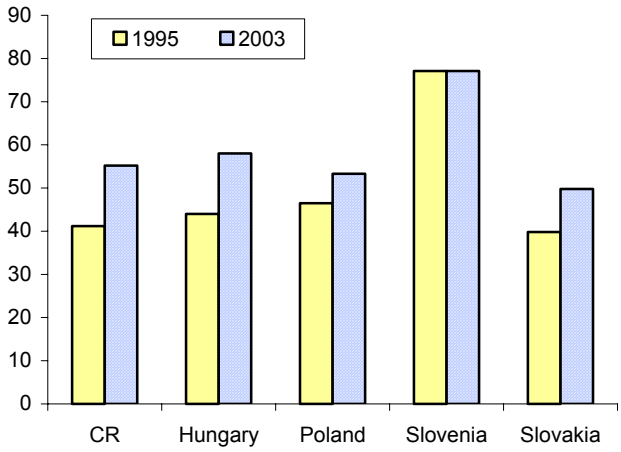
According to a comparison of development in central-European countries, the fastest convergence of price levels takes place in the Czech Republic and Hungary. Both countries raised their relative price levels against the EU25 average by 14 percentage points between 1995 and 2003. The relative price level in Slovakia grew by 10 percentage points. While the relative price level in Poland in 2001 was still higher than in the CR and Hungary, it has been decreasing since and convergence is negative. Slovenia, the most expensive country among those observed in the long term, made no progress in the convergence of price levels over the given period.

[4] Comparable price level of final consumption expenditure of households is the relation between purchasing power parity and market exchange rate for each country. Purchasing power parities are conversion rates used for conversion of economic indicators from the national currencies to a "currency" called Purchasing Power Standard (PPS), which eliminates differences in purchasing power of various national currencies and allows a meaningful comparison. The comparative price level index, compared to the EU average (EU25 = 100), which is higher than 100, indicates that the country is more expensive than the EU average, index below 100 shows that the country is less expensive. Eurostat gives the price level of final consumption expenditure of households incl. indirect taxes.

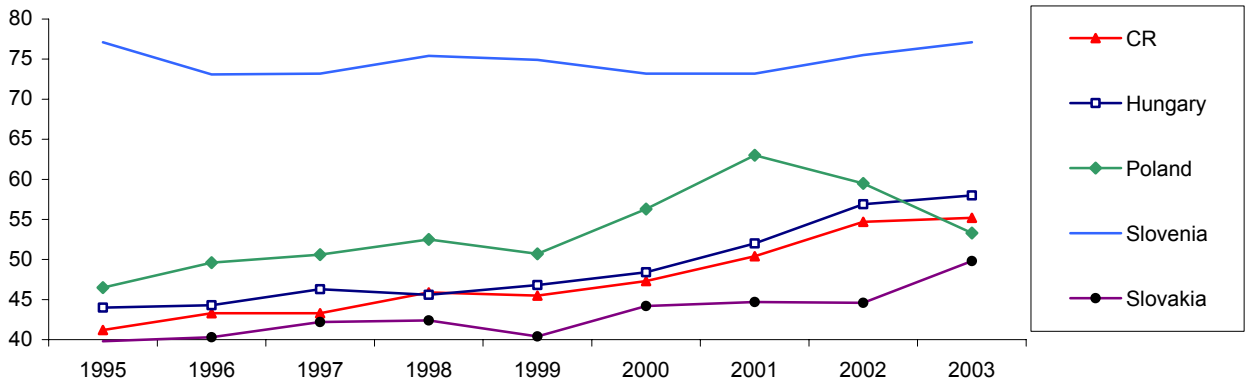
Graph 19 **Comparative price level in the CR** (EU25=100, 1995-2003)



Graph 20 **Convergence of price levels** (1995 and 2003, EU25=100)



Graph 21 **Speed of the convergence of relative price levels** – selected countries (EU25=100)



Productivity

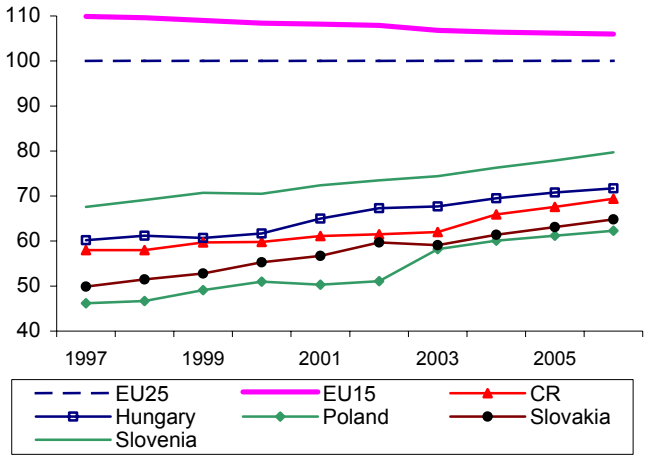
- ***Relative productivity per employee in the CR grew slower than in any other country compared***

Labour productivity per employee[5] in the CR reached roughly 58% of the EU25 average in 1997. This figure increased by 7.9 percentage points up to 2004, which was the weakest relative increase among the new central-European EU member states because Poland recorded growth by 13.9 percentage points in 1997-2004, Slovakia by 11.5 percentage points and Hungary by 9.3 percentage points. Growth in Slovenia was 8.7 percentage points. Over the same period, relative productivity per employee related to the EU25 average in the old EU member states gradually decreased, by 3.5 percentage points in total.

In spite of the weakest dynamics of convergence, the CR's position in relative productivity per employee and productivity per hour is roughly at the average level of the above-mentioned countries. The underlying reason for the considerable difference in productivity levels in these countries compared to the EU15 is still predominantly the structure of their economies. Further changes in this structure seem to be the biggest potential of real convergence in this area.

[5] Measured as GDP in purchasing power parity per employed person.

Graph 22 **Productivity per worker** – GDP in PPS per employed person related to EU25 (EU25=100)



Graph 23 **Labour productivity per hour** – GDP in PPS per hour worked related to EU15 (EU15=100)