Economic Convergence of Central and Eastern European EU Member States over the Last Decade (2004-2014)

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Abstract

This paper takes stock of the progress achieved by the ten Central and Eastern European countries, which entered the EU in 2004 and 2007, in terms of their real and nominal economic convergence vis-à-vis the twelve EU Member States which were part of the euro area in 2004. It thus offers a longer-term perspective on the convergence process while providing a horizontal, cross-country comparison of convergence. Due to its different perspective and purpose, the paper does not assess the compliance with the formal criteria for euro adoption. The paper shows that between 2004 and 2014 most of these countries achieved significant real and nominal convergence vis-à-vis the initial twelve euro-area members.

EXECUTIVE SUMMARY

The paper takes stock of the progress achieved by the ten Central and Eastern European countries (CEE10), which entered the EU in 2004 and 2007, in terms of their real and nominal economic convergence vis-à-vis the twelve EU Member States which were part of the euro area in 2004 (EA12).

A majority of CEE10 countries achieved significant real convergence vis-à-vis the EA12 between 2004 and 2014. However, compared to the period preceding the 2008/09 global financial crisis, real GDP growth weakened considerably in the post-crisis period. Moreover, a substantial real convergence gap, in terms of average GDP per capita in purchasing power standards, remains between the CEE10 and the EA12. The rapid pace of economic convergence in the pre-crisis period partly reflected an investment boom which was not sustained in the post-crisis period. Nonetheless, the openness of the CEE10 economies to trade increased considerably between 2004 and 2014 and they appear in general well integrated with the EA12 through their exports.

Most CEE10 countries also recorded substantial progress in terms of nominal convergence. Over the last decade, five out of ten CEE countries fulfilled the accession criteria and subsequently joined the euro area. Inflationary pressures moderated in the post-crisis period, thanks to more favourable global commodity price developments as well as more subdued growth performance. Despite considerable convergence, there still remains a sizable price-level gap vis-à-vis the EA12, which is larger for non-traded goods. One of the key challenges for the CEE10 will thus be to preserve low inflation rates while succeeding in reinvigorating the pace of real convergence in the coming years.

After having largely deteriorated during the global financial crisis, general government balances of most CEE10 countries gradually improved in the post-crisis period. At the same time, their gross general government debt levels remained significantly below the EA12 average. Long-term interest rate convergence was quite advanced in some Member States already at the time of EU accession. Although the global financial crisis temporarily induced increased risk differentiation by financial markets, long-term spreads tightened again by the end of the reviewed period.

External imbalances of CEE10 economies, which in most cases widened in the pre-crisis period, corrected abruptly during the global financial crisis and then remained quite subdued in the post-crisis period. Nevertheless, despite the substantial adjustment in their balance of payments flows, large negative net international investment positions combined with significant gross external debt levels continue to represent a potential source of external vulnerability for the region.

All CEE10 countries entered the EU with relatively underdeveloped financial sectors, at least in terms of their relative size compared to the EA12. Bank-intermediated funding initially expanded at a rapid pace and thus supported domestic demand growth. Credit expansion slowed down considerably after the 2008/09 global financial crisis as external funding tightened and real convergence prospects were reassessed. The interaction between financial cycles and the process of real converge will remain a crucial factor affecting macro-financial stability of the CEE10 in the years ahead.

In general, the choice of exchange rate regime – i.e. fixed or floating – does not seem to have been the deciding factor for economic performance of CEE10 countries over the past decade. This conclusion is supported by the fact that both Hungary and Romania among floaters and Latvia as fixer had to seek official international financial assistance during the 2008/09 global financial crisis.

INTRODUCTION

Ten Central and Eastern European countries (CEE10) entered the EU in two waves following shortly after each other. In May 2004, eight CEE countries, namely the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovenia and Slovakia entered the EU, together with Malta and Cyprus. In 2007, two other CEE countries, Bulgaria and Romania also joined the EU. Upon their EU entry, all CEE10 countries committed to adopting the euro. They thus became so-called Member States with a derogation, i.e. EU Member States which have not yet fulfilled the necessary conditions for the adoption of the euro.

As a result, the European Commission has regularly assessed the progress they achieved in fulfilling the necessary conditions for euro adoption (i.e. the so called convergence criteria). The Treaty on the Functioning of the European Union (TFEU) requires the European Commission and the European Central Bank (ECB) to report to the Council, at least once every two years, or at the request of a Member State with a derogation, on the progress made by these Member States in fulfilling their obligations regarding the achievement of economic and monetary union. Following their EU entry, five CEE10 countries have so far adopted the euro, with Slovenia joining the euro area in 2007, Slovakia in 2009, Estonia in 2011, Latvia in 2014 and finally Lithuania in 2015.

Given that in May 2014 ten years had passed since the first eight CEE countries joined the EU, this paper takes stock of the progress all CEE10 countries achieved between 2004 and 2014 in terms of their (real and nominal) economic convergence vis-à-vis the average level of the twelve Member States which were part of the euro area in 2004 (EA12). It thus offers a more long-term perspective on the CEE10 convergence compared to the regular bi-annual reports prepared by the Commission and the ECB. In addition, contrary to regular reports which only consider Member States with a derogation on a country by country basis, it provides a more horizontal, cross-country comparison of convergence achieved by all CEE10 countries while analysing convergence both in real and nominal terms. As a result of its different perspective and purpose, the paper does not assess the compliance with the convergence criteria.

The paper is structured in the following way. It first describes prevalent policy frameworks for the implementation of monetary policy in the CEE10. It then looks at real convergence in terms of economic output and trade integration achieved between 2004 and 2014. It thereafter discusses nominal convergence in terms of consumer prices, public sector balances, exchange-rate stability and interest rate developments. It concludes by analysing balance of payments as well as financial sector developments in the CEE10 over the last decade. The report shows that while all CEE10 countries made substantial progress in terms of their real and nominal convergence, this progress was quite uneven across countries and has also not always been smooth/gradual.

1. MONETARY POLICY FRAMEWORKS AND IMPLEMENTATION

The monetary policy frameworks of CEE10 countries are usually distinguished based on their exchange rate regimes (if the period prior to their eventual euro adoption is considered in the relevant cases). While the Czech Republic, Hungary, Poland, Romania and Slovakia (aka "floaters") operate/operated[1] under managed floating exchange rate regimes, Bulgaria, Slovenia and the three Baltic countries (aka "fixers") relies/relied[2] on fixed exchange rate systems. As countries operating under more flexible exchange rate arrangements preserved a higher degree of autonomy, their monetary policy operations could more directly focus on steering domestic price developments. The Czech, Hungarian, Polish and Romanian central banks are thus officially pursuing direct inflation targeting (IT) as did the Slovak central bank prior to the entry into the euro area (see Box 1 for more details on recent history of monetary policy frameworks in the CEE10).

Due to differences in relative price levels, monetary policy credibility as well as prospects for nominal convergence, inflation targets initially varied considerably across IT CEE10 central banks. However, reflecting a successful build-up of policy credibility as well as broader progress in nominal convergence they gradually converged close to the ECB definition of price stability (i.e. inflation close to, but below, 2%). Currently, inflation targets are set at 2% in the Czech Republic, 2.5% in Poland and Romania and 3% in Hungary.

The evolution of policy rates set by IT CEE10 central banks has broadly reflected the overall course of domestic economic and financial cycles. Policy rates reached their troughs in 2005 and in early 2006 in view of the disinflation process which was particularly pronounced in Romania, Hungary and Slovakia. They were subsequently raised between 2006 and 2008 by all IT central banks in view of heightened inflationary pressures reflecting the rapid pace of economic expansion, buoyant credit growth as well as the global commodity price boom. Between late 2008 and early 2010 policy rates were gradually decreased again (apart from a 300 basis point hike by the Hungarian central bank in October 2008 in the midst of a balance-of-payments crisis) as the global financial crisis temporarily hampered economic activity, led to a credit freeze and suppressed global commodity prices, thus driving down domestic inflation rates (as discussed in Subsection 3.1).

Graph 1.1: Policy rates
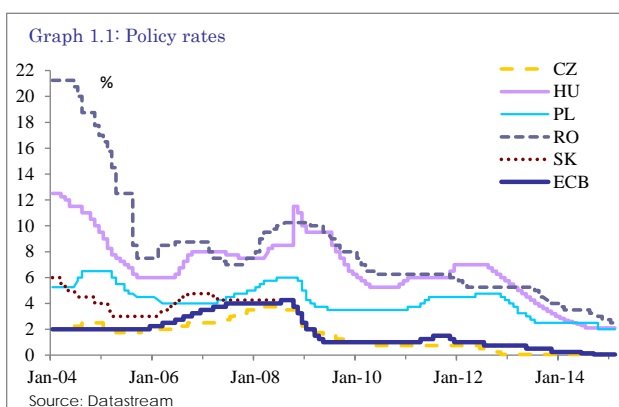
Another wave of policy rate cuts by IT CEE10 central banks was launched around mid-2012. The Hungarian, Polish and Romanian central banks reduced their policy rates by 490, 275 and 250 basis points respectively between mid-2012 and end-2014 as domestic inflationary pressures throughout the region eased further. The scope for rate cuts was more limited in the Czech Republic (cumulatively amounting to "just" 70 basis points during this period) since the ČNB reached its lower bound on the main policy rate of 0,05% already in November 2012.

In November 2013 the ČNB therefore decided to start using the exchange rate as an additional instrument for easing monetary conditions in view of projected price developments indicating an undershooting of the inflation target for a protracted period of time. The ČNB announced that it would intervene on the foreign exchange market to weaken the koruna, so that its exchange rate against the euro was close to 27, and clarified that it regarded this commitment as one-sided, allowing the exchange rate to float freely on the weaker side of this level.

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[1] Slovakia joined the euro area in 2009.
[2] Slovenia joined the euro area in 2007, Estonia in 2011, Latvia in 2014 and Lithuania in 2015.

Bulgaria has operated under a currency-board arrangement (CBA) since 1997, while Estonia and Lithuania also had CBAs since 1990s up to their respective entries into the euro area in 2011 and 2015. Under the currency-board arrangement, monetary liabilities of the central bank (both currency in circulation and its deposit liabilities) have to be fully covered by its gold and foreign exchange reserves. Moreover, the central bank is obliged to exchange its monetary liabilities against the reference currency at the official exchange rate without any limit. **In parallel, Slovenia and Latvia also pegged their currencies tightly to the euro prior to their respective entries into the euro area in 2007 and 2014.** Due to their exchange rate arrangements, these five CEE countries (fixers), could not conduct their own independent monetary policy as conditions at their domestic money markets mainly reflected the policy stance of the reference-currency-issuing central bank.

Box 1: **Recent history of monetary policy frameworks in the CEE10**

Inflation targeting

The Czech National Bank (ČNB) switched to IT under a managed exchange rate float in 1998. The targeted inflation range/band was gradually decreased in following years. In March 2004, a CPI inflation target of 3% was announced for the period starting in January 2006 and in March 2007, a new target of 2% was set with effect from January 2010. The ČNB strives to ensure that actual inflation does not differ from the target by more than one percentage point on either side.

The Hungarian National Bank (MNB) operated under an IT framework combined with an exchange rate peg to the euro (with a ±15% fluctuation band) from 2001 until early 2008 when the peg was abandoned for a managed float. After having been reduced gradually, the inflation target was in 2005 set at 3%, with a tolerance band of ±1 percentage point, for the period starting in 2007 and has remained unchanged thereafter.

The National Banks of Poland (NBP) introduced IT in 1998, still under a crawling peg exchange rate arrangement against a currency basket. In April 2000, Poland switched to a floating exchange rate regime, with the NBP preserving the right to intervene in the foreign exchange market, if it deems this necessary, in order to achieve its inflation target. Starting from January 2004, the NPB has pursued a continuous inflation target of 2.5%, with a permissible fluctuation band of ±1 percentage point.

The National Bank of Romania (NBR) shifted to IT in August 2005 under a managed floating exchange rate regime which has been in place since 1991. The NBR gradually lowered its year-end inflation targets and from 2013 it has pursued a flat multi-annual inflation target of 2.5% ±1 percentage point.

The National Bank of Slovakia (NBS) operated under an implicit IT regime combined with a managed floating exchange rate from 1998 until 2005 when an explicit IT framework was adopted. It continued to pursue IT following the Slovak koruna's ERMII entry in late 2005 until joining the Eurosystem in 2009. The inflation target was gradually lowered to below 2% by end-2007.

Exchange rate targeting

Bulgaria introduced its CBA in 1997, pegging the Bulgarian lev to the German mark and subsequently to the euro. As a consequence of the CBA, there has been no fluctuation in the lev's exchange rate against the euro.

Estonia operated under a CBA from 1992 until its euro-area entry in 2011. The Estonian kroon was initially pegged to the German mark with the peg switched to the euro in 1999. The kroon joined ERMII in 2004 with the Estonian authorities unilaterally committing to maintain the currency board within the mechanism. As a result, there was no deviation from the central rate during the kroon's participation in ERMII.

Latvia tightly pegged its exchange rate from 1994 until its euro-area entry in 2014. The Latvian lats was pegged to the SDR basket of currencies until 2005 when the peg was changed to the euro at the prevailing market rate. The lats entered ERMII later in 2005 with the Latvian authorities unilaterally committing to maintain a tighter fluctuation margin of ±1 percent around the central parity rate. Consequently, the lats only fluctuated in this narrow band during its participation in ERMII, though it was subject to severe tensions at the height of the financial crisis.

Lithuania operated under a CBA from 1994 until its euro-area entry in 2015. The Lithuanian litas was initially pegged to the US dollar before switching to the euro in 2002. The litas joined ERMII in 2004 with the Lithuanian authorities unilaterally committing to maintain the currency board within the mechanism. As a result, there was no deviation from the central rate during the litas' participation in ERMII.

> **The Bank of Slovenia conducted monetary policy through a combination of interest rate policy and exchange rate management before joining ERMII in 2004.** The Slovenian tolar traded close to its central rate during its participation in ERMII until the euro-area entry in 2007.

2. REAL CONVERGENCE[3]

In this section the process of real convergence is assessed by looking at real GDP growth rates and relative levels of GDP per capita in purchasing power standards. In addition, the role of investment, which should theoretically (due to higher rates of return in lower income countries) be a natural driver of real convergence, is analysed. Finally, the degree of trade openness and in particular goods exports to the euro area are also considered.

2.1. GDP GROWTH AND PER CAPITA LEVELS IN PURCHASING POWER STANDRARDS

CEE10 economies expanded at a strong pace prior to the 2008/09 global financial crisis. Average[4] real GDP growth in the CEE10 picked up from about 6% in 2004-05 to above 7% in 2006-07 before cooling down to 2.5% in 2008. As a result, it averaged almost 6% in the period 2004-08, compared to about 2.5% achieved on average by EA12 countries. Rapid real convergence was supported by a benign global environment and foreign capital inflows to the region, combined with optimistic expectations about growth prospects within the enlarged EU.

However, the composition of GDP growth differed considerably across CEE10 economies in the pre-crisis period. In the Baltics, as well as in Poland, Romania and Bulgaria, GDP growth was driven by increases in domestic demand, as credit booms (discussed in Section 5) fuelled domestic consumption and investment. On the other hand, growth was more balanced in the Czech Republic, Hungary, Slovakia and Slovenia, where net exports (albeit in some case only marginally) also contributed to GDP growth. Due to rapid and in some cases overly unbalanced growth, most CEE10 countries accumulated considerable internal and external imbalances, reflected in elevated inflation rates and high current account deficits (discussed in Section 4). This made them vulnerable to a reversal in foreign capital inflows, especially if accompanied by a significant deterioration in their overall external environment.

Their economic performance was thus seriously affected by the 2008/09 global financial crisis, with all CEE10 countries apart from Poland posting negative growth rates in 2009. The three Baltic countries experienced the most severe recessions, with real GDP levels dropping by some 14-15% in 2009 (after Estonia and Latvia had already recorded annual GDP contractions of about 5% and 3% respectively in 2008). On the other hand, whereas only the Polish economy continued to expand in 2009, other CEE10 countries experienced output losses in the range of around 5-8%.
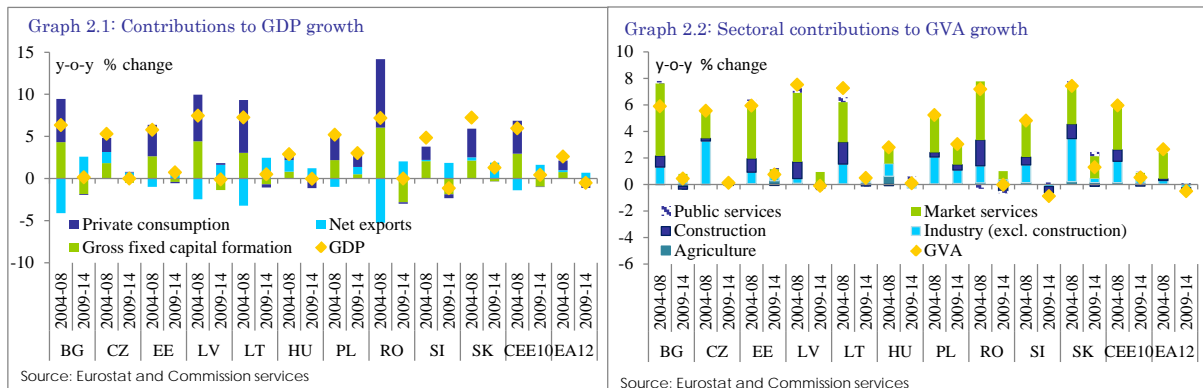
Most CEE10 economies, except for Latvia and Romania which suffered a more protracted recession, already exhibited positive annual growth for 2010. However, compared to their pre-crisis levels, growth rates remained significantly lower in the post-crisis period (the slow-down was extensively discussed e.g. in the EBRD Transition Report 2013). Real GDP growth in the CEE10 averaged just about 2% between 2010 and 2014 (though still well above the EA12 average of 0.3%) and was in general driven solely by net exports. Moreover, three CEE10 countries, namely the Czech Republic, Slovenia and Hungary, slipped back into recession in 2012, with the former two recording negative annual growth rates also in 2013. Economic performance of the CEE10 improved again in 2014, benefiting from a more favourable external environment and highly accommodative monetary policy of major global as well as domestic central banks.

From the sectoral perspective, economic expansion in the CEE10 was in the pre-crisis period to a large extent driven by market services, while the growth contributions of industry and
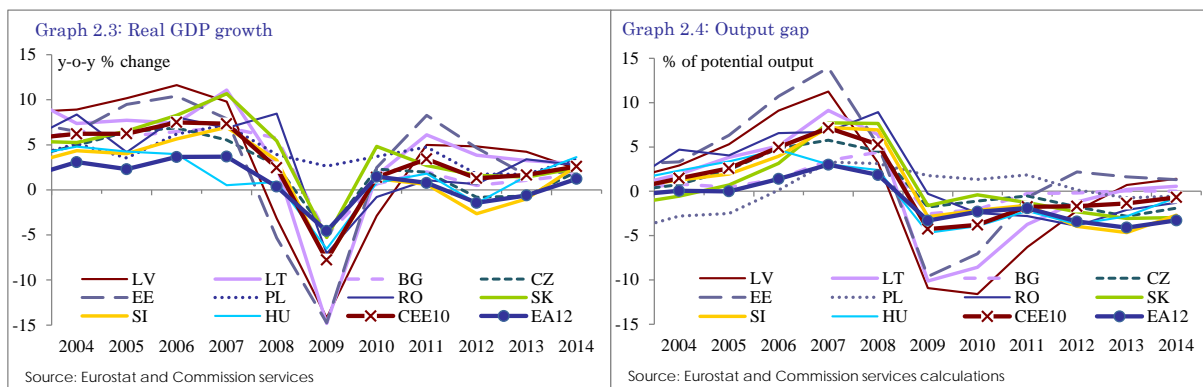
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[3] This section benefited from analytical input provided by Julda Kielytė.
[4] Un-weighted averages are used throughout the study unless specified otherwise.

construction were on average also significant. The growth contributions of all main sectors declined considerably in the post-crisis period. Although the contribution of market services remained on average positive, industry only contributed marginally and the growth contribution of the construction sector was overall negative, thus temporarily hampering the convergence process.

Graph 2.1: Contributions to GDP growth

Source: Eurostat and Commission services

Graph 2.2: Sectoral contributions to GVA growth

Source: Eurostat and Commission services

Considering the GDP evolution in comparison to its estimated potential level suggests that while the pre-crisis boom in the CEE10 was to some extent a cyclical phenomenon, the post-crisis slow-down in real convergence largely reflects lower potential growth. The average output gap in the CEE10 is estimated to have increased from about 1.5% of potential GDP in 2004 to above 7% in 2007 before correcting somewhat to around 5% in 2008. After having turned negative by falling below -4% of potential output in 2009, the output gap initially tightened swiftly to above -2% by 2011. It subsequently became more persistent as it remained negative at some -1% of potential output by 2014, implying that lower growth rates in the post-crisis period have largely reflected a decline in potential growth.

Graph 2.3: Real GDP growth

Source: Eurostat and Commission services

Graph 2.4: Output gap

Source: Eurostat and Commission services calculations

As a result of relatively higher GDP growth rates, CEE10 countries achieved significant real convergence vis-à-vis the EA12 between 2004 and 2014. The CEE10 average GDP per capita level in purchasing power standards (PPS) increased from about 50% of the EA12 level in 2004 to above 58% in 2008. After having declined somewhat in 2009, it increased gradually to some 64% of the EA12 level in 2014. However, there was a considerable cross-country variation with the pace of convergence in general inversely related to initial income levels. Considering the three most developed CEE10 economies in 2004, Slovenia has not enjoyed any real convergence, while the catch-up was also relatively limited in the Czech Republic and Hungary (as also pointed out by e.g. Dabrowski (2014)). On the other hand, relative GDP per capita levels in PPS increased by about 20 percentage points in Baltic countries, Poland, Romania and Slovakia. Nevertheless, Bulgaria, which started with the second lowest GDP per capital level in 2004, also only achieved a below-average pace of convergence of some 11 percentage points.

The post-crisis slow-down in the real convergence process of the CEE10 reflected both internal and external factors. The reassessment of the sustainable pace of economic expansion in view of the

crisis experience dampened consumption growth and investment demand by the private sector. At the same time, the borrowing needs of the government sector had to be reduced after having substantially increased during the crisis period (see Subsection 3.2). As a result, the growth contribution of domestic demand declined considerably, implying a higher reliance on net exports as a driver of growth. However, the sovereign debt crisis and the related recession in the euro area also weighed on consumer and investor confidence throughout the continent, constrained funding availability and thus limited demand for exports from the CEE10.

2.2. THE ROLE OF INVESTMENT

The rapid pace of economic convergence in the pre-crisis period partly reflected an investment boom. The average share of gross fixed capital formation (GFCF) in the CEE10 increased from below 25% of GDP in 2004 to above 29% of GDP in 2007 and 2008 while it remained below 24% of GDP in the EA12. This investment boom was stimulated by optimistic growth expectations and supported by external funding availability. There was however considerable cross-country heterogeneity, as GFCF exceeded 30% of GDP in Estonia and Latvia whereas it remained below 25% of GDP in Poland and Hungary. Although on average roughly half of GFCF consisted of construction both in the CEE10 and the EA12, housing accounted for only about fourth of construction activity in the CEE10, compared to more than 50% in the EA12. This could be interpreted as overall indicating a more productive investment mix in the CEE10 in the run-up to the 2008/09 global financial crisis.

The contribution of investment activity to real convergence was not sustained in the post-crisis period. The average share of GFCF in the CEE10 declined to about 22% of GDP in 2010 and then remained broadly stable up to 2014 (while it declined to below 19% of GDP in 2013-14 in the EA12) as growth prospects were reassessed and private funding availability tightened but investment activity in the region was still supported by substantial inflows of EU funds. Only the Czech Republic, Estonia and Romania recorded GFCF amounting to at least 25% of GDP in 2009-14, whereas its share fell to below 20% of GDP in Poland and Lithuania. On the other hand, the decline was overall broad-based across all main asset types in the CEE10 while it was largely driven by a drop in housing construction in the EA12.
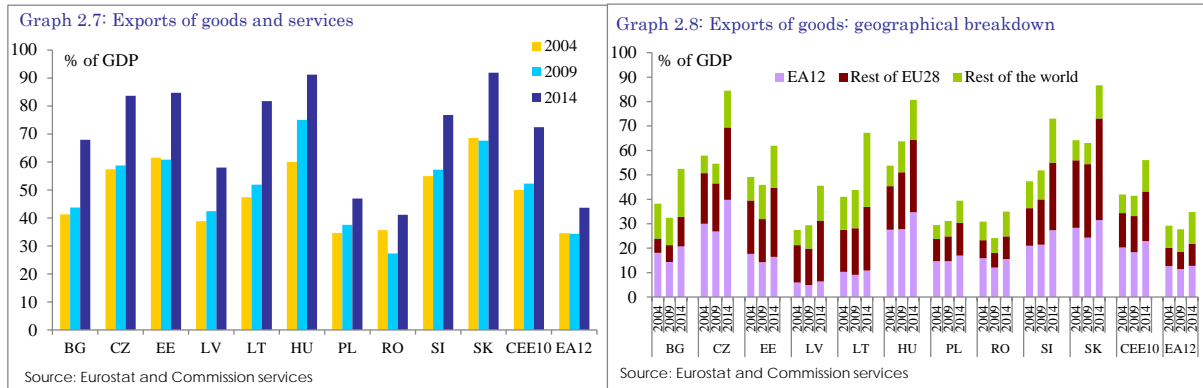

Graph 2.5: Investment by asset type

Graph 2.6: GDP per capita (PPS)
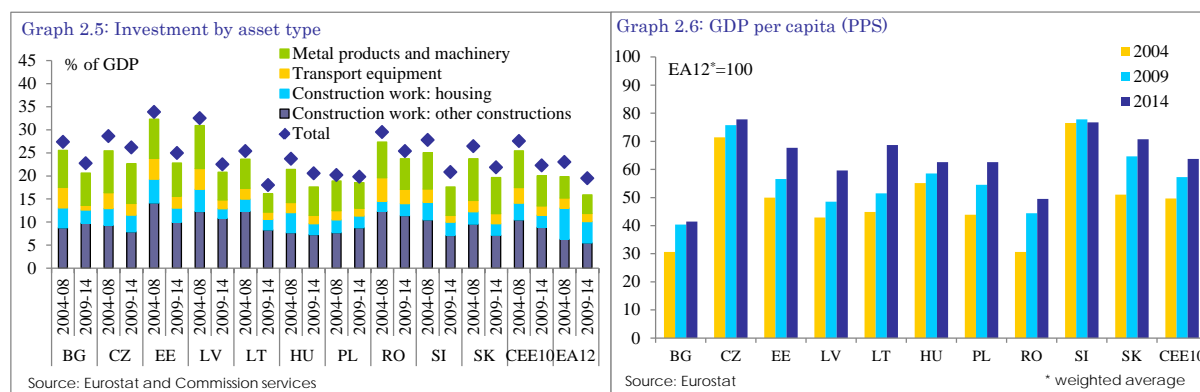
2.3. OPENNES TO TRADE AND TRADE INGRATION WITH THE EA12

The openness of the CEE10 economies to trade improved considerably between 2004 and 2014. Exports of goods and services amounted on average to about 50% of GDP across the CEE10 in 2004. While this share was only some 2 percentage points higher in 2009 it stood above 70% of GDP in 2014, as the growth contribution of exports increased significantly in the post-crisis period. Nevertheless, there remained significant differences among CEE10 countries, with exports accounting for more than 90% of GDP in Hungary and Slovakia but for less than 50% in Poland and Romania in 2014.

Goods exports from the CEE10 to the EA12 also increased over the last decade. Although the average GDP share of goods exports from the CEE10 to the EA12 declined from above 20% in 2004
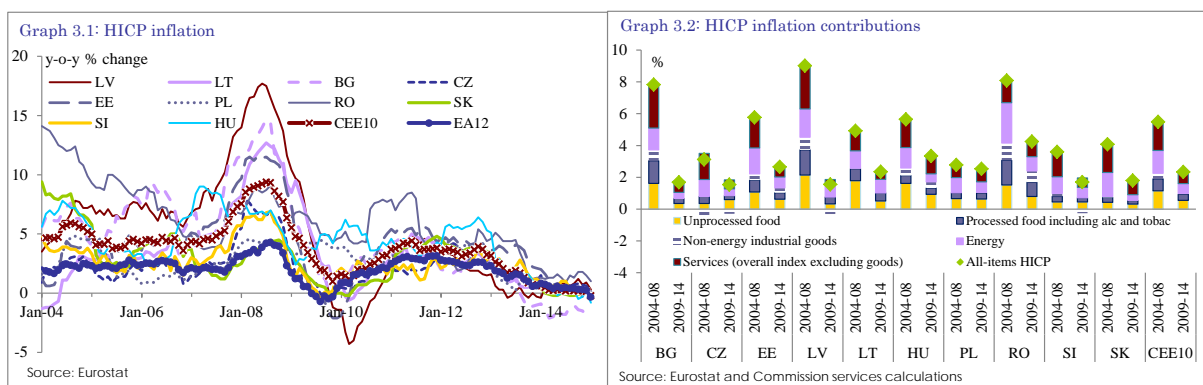
to about 18% in 2009, it increased to almost 23% by 2014. At the same time, goods exports from the EA12 countries to the rest of the EA12 remained on average broadly stable at below 13% of GDP. As a result, CEE10 countries appear in general well integrated with the EA12 in terms of their export performance. However, while the share of goods exports to the EA12 exceeded 30% of GDP in the Czech Republic, Hungary and Slovakia in 2014, it remained below 20% of GDP in the Baltics, Poland and Romania. This indicates that the relevance of goods exports to the EA12 varies considerably across the CEE10.

Graph 2.7: Exports of goods and services

Source: Eurostat and Commission services

Graph 2.8: Exports of goods: geographical breakdown

Source: Eurostat and Commission services

3. NOMINAL CONVERGENCE[5]

3.1. INFLATION AND PRICE LEVEL CONVERGENCE

After remaining broadly stable between 2004 and 2007, consumer price inflation picked up considerably in most CEE10 countries in 2008. The average rate of HICP inflation in the CEE10 increased from about 5% in 2004 to above 8% in 2008, compared to the EA12 average of 2.2% in 2004 and 3.5% in 2008. Apart from the overall faster pace of economic expansion, the divergence also reflected the fact that the inflationary impact of the 2007/08 global commodity price boom was accentuated by higher shares of food and energy items in the CEE10 countries' consumption baskets. Latvia, Romania and Bulgaria recorded the highest inflation rates in the 2004-08 period amidst strong domestic demand growth. On the other hand, domestic price pressures were relatively moderate in the Czech Republic and Poland, also thanks to the dampening impact of trend nominal exchange rate appreciation on import prices (which also affected price developments in Slovakia and Romania).

Graph 3.1: HICP inflation

Source: Eurostat

Graph 3.2: HICP inflation contributions

Source: Eurostat and Commission services calculations

In 2009, inflation rates declined significantly in all CEE10 countries except Poland, reflecting the collapse of global commodity prices as well as the substantial cooling of economic activity. While the Czech Republic, Estonia, Slovakia and Slovenia recorded inflation rates of less than 1%, consumer prices still increased by at least 4% in Lithuania, Hungary, Poland and Romania, partly due

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[5] This section benefited from analytical input provided by Julda Kielytė.
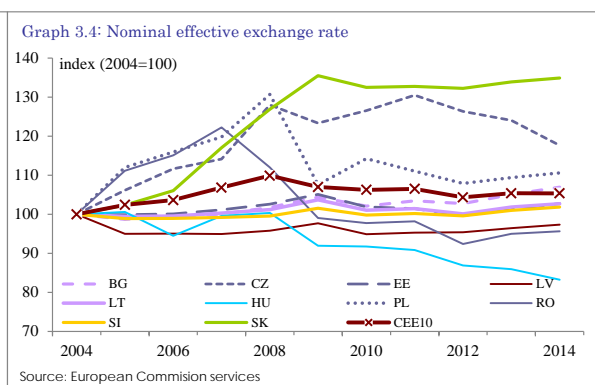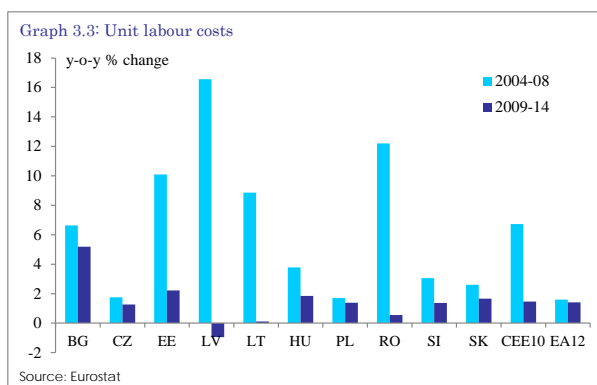
to indirect tax hikes. HICP inflation thus averaged 2.6% across the CEE10 in 2009, compared to just 0.2% for the EA12.

In the post-crisis period, inflation rates in the CEE10 remained generally lower than in the pre-crisis period. Although the average inflation rate increased to almost 4% in 2011, it then declined gradually close to zero in 2014, reflecting favourable global commodity and consumer price developments as well as a relatively subdued growth performance. In 2010-14, the average annual inflation rate exceeded 3% only in Estonia, Hungary and Romania, while it amounted to less than 2% in Bulgaria, the Czech Republic, Latvia and Slovenia (and 1.7% in the EA12).

The post-crisis decline in consumer price growth in the CEE10 was relatively broad-based as the average inflation contributions of all five main HICP items decreased significantly. Although the average inflation contribution of services recorded the largest drop among the main HICP items, it continued to account for the biggest share of HICP inflation (in line with its basket share), followed by energy, unprocessed and processed food. On the other hand, despite registering the lowest decline, the average inflation contribution of non-energy industrial goods fell close to zero. As a result, core inflation only averaged about 1.2% across the CEE10 in the 2009-14 period, compared to almost 3% in the 2004-08 period.

The decline in HICP inflation was supported by lower increases in unit labour costs (ULC). Annual ULC growth in the CEE10 averaged almost 7% in the period 2004-08, compared to just 1.6% for the EA12. While double-digit average annual growth rates were in this period recorded in Estonia, Latvia and Romania, ULC growth averaged less than 2% in the Czech Republic and Poland. Labour cost pressures subsided considerably in the post-crisis period amid increased unemployment levels, a slower pace of economic expansion and lower inflation expectations. Annual ULC growth averaged just around 1.5% across the CEE10 in the period 2009-14, which was roughly equal to the EA12 average. Cross-country variation also declined as average annual ULC growth remained below 2.5% in all CEE10 countries apart from Bulgaria.

Nominal effective exchange rates (NEERs) were naturally more volatile and therefore had a larger impact on domestic price developments in the CEE10 countries operating under floating exchange rate regimes. Between 2004 and 2008, the NEERs of the Czech Republic, Poland, and Slovakia appreciated by about 30% and Romania's NEER by more than 10% (having peaked already in 2007), dampening consumer price growth in these countries. During the 2008/09 global financial crisis, Poland's and Romania's NEERs depreciated to close to their 2004 levels and thus had an inflationary impact on these economies. NEERs remained in general more stable in the post-crisis period. Nevertheless, NEERs of the Czech Republic and Hungary depreciated by about 13% and 7% between 2011 and 2014, reflecting monetary policy easing by their national central banks (discussed in Section 1).

Graph 3.3: Unit labour costs
Source: Eurostat

Graph 3.4: Nominal effective exchange rate
Source: European Commision services

Despite considerable convergence, there still remains a sizable price-level gap vis-à-vis the EA12. The average price level of final consumption by private households in the CEE10 increased rapidly from about 54% of the EA12 average in 2004 to above 67% in 2008. However, after having

dropped by 3 percentage points in 2009 it remained broadly stable thereafter, amounting to some 63% of the EA12 average in 2014, amid significant cross-country variation. While the consumption price level stood at above 80% of the EA12 average in Slovenia, and above 70% in Estonia and Latvia, it remained below 50% in Bulgaria and below 60% in Hungary, Poland and Romania. In all CEE10 countries, the remaining gap vis-à-vis the EA12 is larger for non-traded goods, i.e. services (see Box 2 for a more thorough discussion of price convergence).
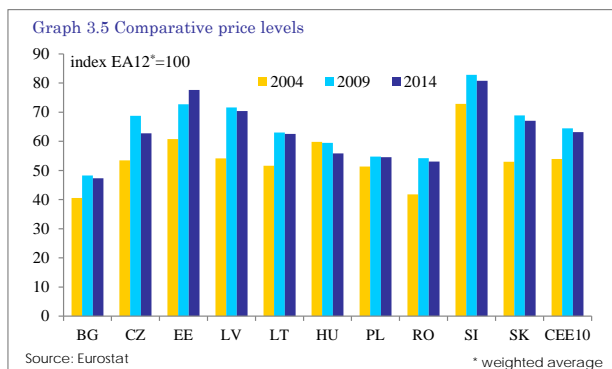
Hence, one of the key challenges for the CEE10 will be to keep inflation moderate in the coming years while at the same time succeeding in reinvigorating real convergence. The fact that the convergence

Graph 3.5 Comparative price levels
index EA12*=100
2004 2009 2014
BG CZ EE LV LT HU PL RO SI SK CEE10
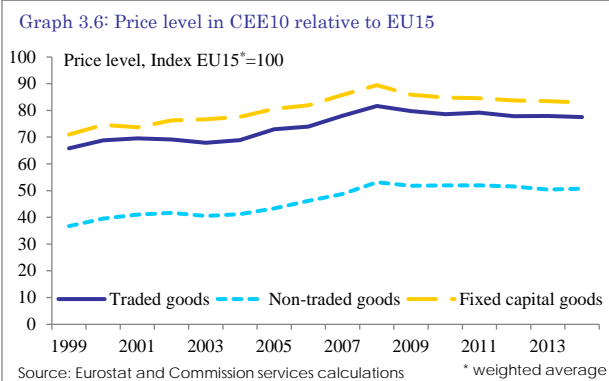Source: Eurostat   * weighted average

gap narrowed significantly both in nominal and real terms over the past decade implies that the pace of trend convergence may be slower than in the past. Moreover, lower inflation rates in the post-crisis period should help to anchor inflation expectations at lower levels and thus facilitate the preservation of price stability by inflation-targeting central banks. At the same time, the pre-crisis experience has shown that the overall policy mix and in particular the interaction between economic and financial cycles (discussed in Section 5) are crucial determinants of macro-financial stability.

Box 2: **Price convergence in the CEE10 after the EU accession – sectoral perspective**[6]

EU accession offered the CEE10 full access to the EU single market by removing the rest of existing trade and investment barriers. The resulting closer economic integration should lead to price convergence across the Member States. While free trade should primarily affect the prices of traded goods, the relative prices of non-traded goods could also be subsequently impacted, for example through the Balassa-Samuelson effect.

Price levels[7] in the CEE10 were converging already before EU accession, which is not surprising as these countries had signed trade agreements with the EU already in the 1990s (see Graph 3.6). The pace of price convergence accelerated after the 2004/2006 EU enlargements. However, the period of faster price convergence lasted just around five years, and afterwards relative price levels have stayed largely unchanged in most countries.

Moreover, the levels to which prices converge differ significantly across price categories. Prices of capital goods have converged closest to the EU average, reaching on average about 85% of the price level in the EU15. Prices of traded goods have also converged relatively strongly, reaching on average about 80% of the EU15 level. The almost[8] full price convergence for traded goods is in line with the theory that within the single market prices of traded goods should even out (law of one price). On the other hand, prices of non-traded goods have so far converged to a level which is on average only about 50 % of the EU15 level.

Graph 3.6: Price level in CEE10 relative to EU15
Price level, Index EU15*=100
1999 2001 2003 2005 2007 2009 2011 2013
Traded goods --- Non-traded goods --- Fixed capital goods
Source: Eurostat and Commission services calculations   * weighted average

Although price levels have overall converged in all CEE10 countries there remain considerable cross-country differences (see graphs in the ANNEX). In Bulgaria, Poland and Romania price levels are overall significantly lower than in the other CEE10 countries, whereas in Estonia and Slovenia the prices of traded goods are closest

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[6] This Box was prepared by Lauri Vilmi.

[7] Annual price level index data constructed by Eurostat are used. Data consists of 146 consumer expenditure headings and 33 headings on gross fixed capital formation. Price indices for traded and nontraded goods and gross fixed capital formation are constructed using the definition of traded and nontraded goods by Berka and Devereux (2010). The indices are unweighted averages of individual headings belonging to each category.
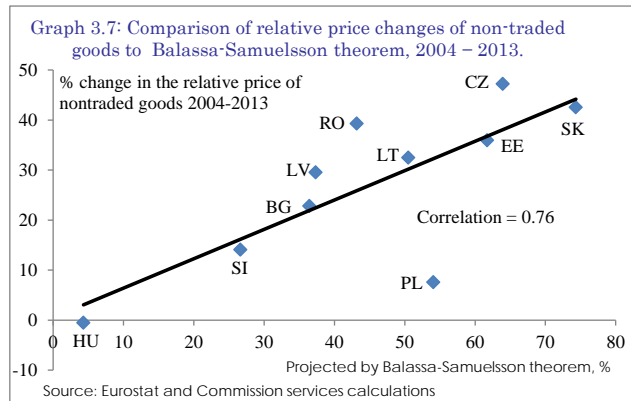
[8] It should be noted that final prices of traded goods might also reflect their non-traded components, e.g. services provided by retailers, which may explain less than full price convergence.

to the EU15 level. After having reached about 80 % of EU15 average, prices of traded goods in Hungary and Poland have followed a downward trend in recent years. Moreover, prices of non-traded goods in Poland have not exhibited a persistent convergence trend from the late 1990s.

According to the Balassa-Samuelson theorem, formulated by Balassa (1964) and Samuelson (1964), cross-country differences in price levels reflect relative productivity differences in the traded and the non-traded sector. In its simplest specification,[9] changes in relative prices of non-traded goods reflect changes in relative prices of traded goods as well as changes in traded sector productivity differences compared to changes in non-traded sector productivity differences between countries.[10]

The evolution of relative prices of non-traded goods in the CEE10 seems to have followed quite closely the predictions of the Balassa-Samuelson theorem (see Graph 3.7).[11] The main driver of non-traded goods prices in the CEE10 was manufacturing sector productivity, which increased on average by more than 40 % faster than the EU15 average between 2004 and 2013 whereas service sector productivity only increased by about 10 % relative to the EU15 average. The differences in the sectoral productivity growth thus can explain a significant share of price convergence in the non-traded sector, which nevertheless also reflected the convergence of traded goods prices by 13 % on average. Thus, similarly to the results of Mihaljek and Klau (2008) and Égert et al. (2003) from the late 1990's and early 2000's the Balassa-Samuelsson effect seems to have contibutated to relative price convergence in the CEE10 during the last ten years.

Poland represents the main outlier, as higher productivity in its manufacturing sector did not translate into higher prices in its non-traded sector. The weak price convergence in the Hungarian non-traded sector can, instead, be explained by the relatively weak productivity evolution in its manufacturing sector relative to the EU15.

Graph 3.7: Comparison of relative price changes of non-traded goods to Balassa-Samuelsson theorem, 2004 − 2013.

Source: Eurostat and Commission services calculations

3.2. PUBLIC FINANCES

In the pre-crisis period, general government balances remained negative in all CEE10 countries apart from Bulgaria and Estonia. The average general government deficit in the CEE10 remained at just below 2% of GDP between 2004 and 2006, before dropping to about 1% of GDP in 2007 as booming economic activity facilitated fiscal consolidation. At the same time, the average general government deficit in the EA12 declined from almost 2.5% of GDP in 2004 to about zero in 2007. While the Czech Republic, Poland, Slovakia and Hungary were put under the excessive deficit procedure (EDP) in 2004, the former three countries successfully exited the EDP in 2008.

The economic downturn induced by the 2008/09 global financial crisis had a significant negative impact on fiscal positions of most CEE10 countries. Their average general government deficit thus increased to some 6.5% of GDP in 2009, compared to about 7% of GDP in the EA12. Given that all CEE10 countries except Estonia recorded deficits above the 3% limit, they were put under the EDP throughout 2009 and 2010 (Hungary had been under the EDP since 2004). These high deficit levels suggested that rapid economic expansion in the pre-crisis period was in some cases not sufficiently exploited to strengthen fiscal positions and thus make these economies more resilient to economic downturns.

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[9] With the share of labour in production equal for traded and non-traded goods and all countries having similar production structure.

[10] This can be expressed as an equation $(\hat{P}_i^N - \hat{P}_{EU}^N) = (\hat{P}_i^T - \hat{P}_{EU}^T) + (\hat{A}_i^T - \hat{A}_{EU}^T) - (\hat{A}_i^N - \hat{A}_{EU}^N)$ in which the relative prices of non-traded goods $\hat{P}_i^N - \hat{P}_{EU}^N$ reflect changes in the traded good prices $\hat{P}_i^T - \hat{P}_{EU}^T$ and traded sector productivity differences $\hat{A}_i^T - \hat{A}_{EU}^T$ relative to non-traded sector productivity differences $\hat{A}_i^N - \hat{A}_{EU}^N$.

[11] The relative prices of non-traded goods have in most cases increased somewhat less than predicted by the Balassa-Samuelson theorem. This might also result from the reliance on the simplified version of the theorem which does not take into account possible differences in labour shares of production across the sectors and countries as well as possible measurement errors and biases caused by the weighting of different good categories.
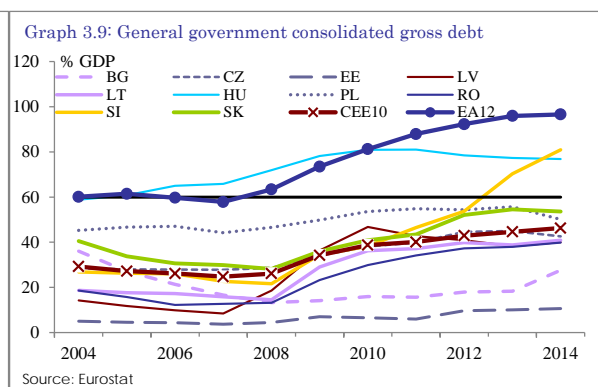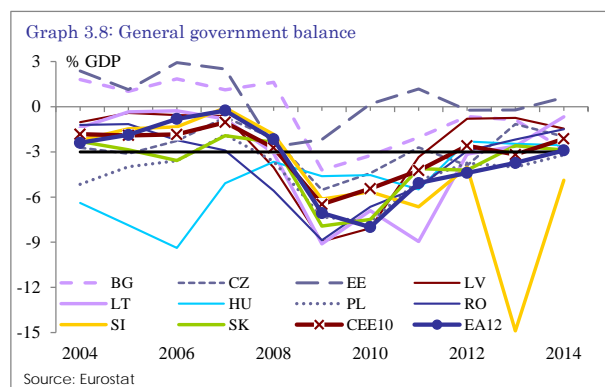
General government balances largely improved in the post-crisis period as substantial fiscal consolidation measures were supported by a measured but in general steady economic recovery. The average general government deficit in the CEE10 thus decreased to about 2% of GDP in 2014 while the EA12 average amounted to almost 3% of GDP. As a result, only Poland[12] and Slovenia remained under the EDP by end-2014.

no EDP / in EDP	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Bulgaria												
Czech Republic												
Estonia												
Latvia												
Lithuania												
Hungary												
Poland												
Romania												
Slovenia												
Slovakia												
not in the EU												

Thanks to a strong growth performance between 2004 and 2007, public debt-to-GDP ratios declined in all CEE10 countries except Hungary. The average general government consolidated gross debt level in the CEE10 decreased from above 29% of GDP in 2004 to below 25% of GDP in 2007 and thus stood far below the EA12 average of some 58% of GDP. However, increased public sector deficits combined with mostly lower GDP levels pushed up the average gross debt level in the CEE10 to above 34% of GDP in 2009, while it increased to almost 74% of GDP in the EA12. A protracted period of excessive deficits in a number of CEE10 countries amid a generally slow pace of economic recovery caused the average gross debt level in the CEE10 to increase further to above 46% of GDP in 2014, whereas the EA12 average jumped to almost 97% of GDP. The largest increase in the CEE10 of more than 40 percentage points between 2010 and 2014 was recorded in Slovenia as a result of the fiscal costs of its bank recapitalisation measures. The negative impact of the 2008/09 global financial crisis as well as the following euro-area sovereign debt crisis on financial conditions in the CEE10 (see Graphs 3.14 and 3.15) revealed that, despite relatively lower general government debt levels (compared to the EA12 average), some CEE10 countries might still encounter problems to (re-)finance their public sector borrowing needs during periods of heightened financial market tensions as their domestic bond markets are in general smaller and less liquid (see Sections 4 and 5 for more details).

Graph 3.8: General government balance

Graph 3.9: General government consolidated gross debt

Source: Eurostat

Source: Eurostat

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[12] The EDP for Poland was abrogated in June 2015.

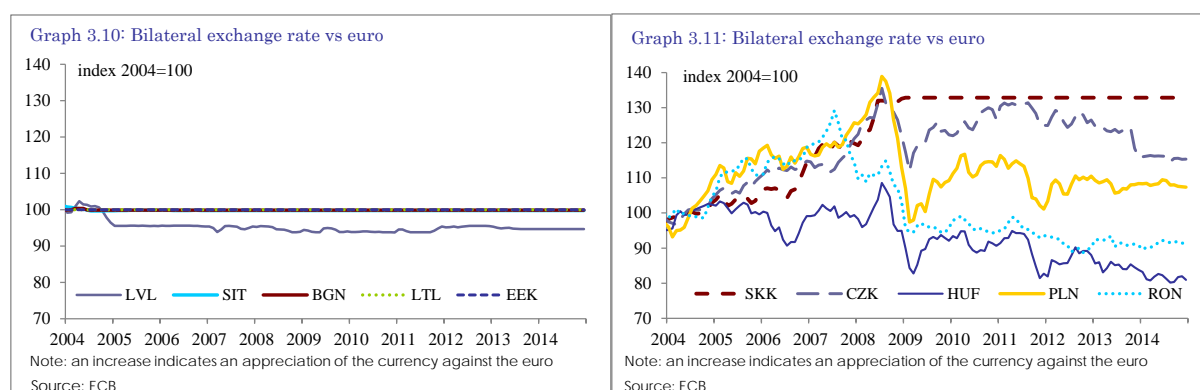## 3.3. EXCHANGE RATE AND INTEREST RATE DEVELOPMENTS

Exchange-rate targeting CEE10 countries (fixers) were successful in maintaining the stability of their currencies to the euro. Among them, the Baltic States adhered to their unilateral commitments in ERMII to keep a more narrow fluctuation band than the standard +/-15% allowed by the mechanism. However, the nominal stability of the exchange rate sometimes masked underlying changes in economic fundamentals and market sentiment.

During the 2008/09 global financial crisis, the Latvian lats experienced severe tensions in its narrow fluctuation band against the euro, as the financial market questioned the authorities' capacity to sustain the exchange rate regime. The fixed exchange rate of Latvia could only be maintained with the help of an international balance-of-payments assistance programme. Sustaining their currency board arrangements also required considerable policy efforts in Estonia, Lithuania and Bulgaria, but these Member States were better prepared to weather the consequences of the pre-crisis overheating and withstand the time needed for internal adjustment to work. From 2015, Bulgaria remains the only fixer among the CEE10, as all other countries from this group have already adopted the euro.

In the 2004-08 period, there was in general a broad-based trend of nominal appreciation of CEE10 floating currencies vis-à-vis the euro, which was consistent with the central banks' efforts to tame the inflationary impact of rapidly rising domestic demand. However, concerns about the macro-economic policy stance and the lack of credibility of the inflation target prevented the Hungarian forint (which was kept in a +/-15% fluctuation band against the euro until early 2008) from nominal appreciation. At the same time, after the Slovak koruna entered the ERMII in late-2005, its central parity rate was twice revalued (in March 2007 and May 2008) before eventual euro adoption in 2009.

The 2008/09 global financial crisis, which on top of a general increase in risk aversion was also accompanied by higher perceived riskiness of the CEE10, resulted in capital outflows and significantly weaker local exchange rates to the euro. Among the floaters, Hungary and Romania had to request international financial assistance to support their balance-of-payments positions. Nevertheless, the Czech koruna, the Polish zloty as well as the Hungarian forint quickly recovered a part of their losses after financial market tensions had peaked in March 2009.

In 2009-14, the forint and the leu followed a shallow depreciating trend to the euro, as it took time for domestic policy authorities to better anchor inflation expectations and regain financial market credibility. On the other hand, the Czech koruna and the zloty were overall broadly stable in this period, with the zloty hovering at a weaker level relative to its pre-crisis average than the koruna. In the pursuit of its inflation target in an environment of low imported inflation, the ČNB weakened the koruna by establishing a currency ceiling to the euro from late 2013.

Graph 3.10: Bilateral exchange rate vs euro
index 2004=100
Note: an increase indicates an appreciation of the currency against the euro
Source: ECB

Graph 3.11: Bilateral exchange rate vs euro
index 2004=100
Note: an increase indicates an appreciation of the currency against the euro
Source: ECB

Exchange rate volatility of the CEE10 floating currencies (vis-à-vis the euro) was mostly higher in 2009-14 than before the crisis (except for Romania). It peaked during the second half of 2008

and first half of 2009. Over the whole period, the most volatile (vis-à-vis the euro) among the floating currencies were the forint and the zloty and the least volatile was the Czech koruna which is generally considered as a "safe haven" currency within the region due to the country's strong fundamentals.
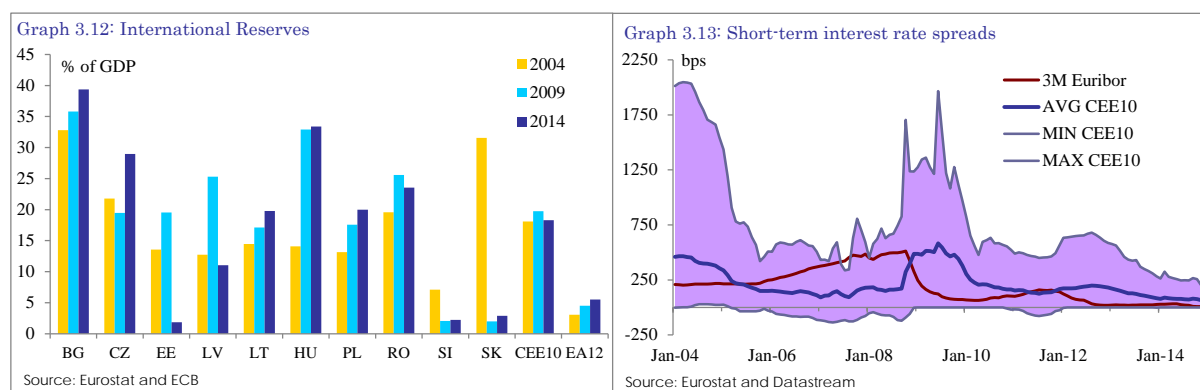
The non-euro-area CEE10 countries have kept generally higher international reserve levels in the post-crisis period. The 2008/09 crisis revealed that Latvia, Hungary and Romania had accumulated insufficient foreign exchange reserves in 2004-08 and thus had to be supported by international financial assistance. Improved external balance positions allowed Hungary and Romania to build higher international reserves in the post-crisis period, even after repaying the bulk of their international financial assistance loans. On the other hand, switching to an international reserve currency enabled euro-area entrants to considerably decrease their foreign exchange reserve holdings.

The Czech Republic and Poland turned out to be less vulnerable to the 2008/09 crisis, but their international reserve holdings also increased during 2009-14. Apart from improved external balances, the increase also reflected the use of the exchange rate as an additional monetary policy instrument in the case of Czech Republic. The currency board of Bulgaria has been supported by high international reserves throughout the last decade.

In 2004-08, the CEE10s' short-term interest rate differentials to the euro area narrowed, as inflation moderated. Differences among the CEE10 mainly reflected varying country risk and, in case of the inflation targeters, also variations in domestic inflation rates. The tighter policy stance of some central banks, intended to curb excessive growth of domestic demand, encouraged a further shift in bank lending to foreign currencies (discussed in Section 5), which eroded their influence on retail lending rates, i.e. reduced the effectiveness of domestic monetary policy. The Czech Republic managed to avoid this trap as its short-term rates were sometimes even below the euro-area level.

Short-term spreads over the Euribor increased drastically in the CEE10 during the global financial crisis, with large differences at the individual country level mainly reflecting differences in external shock-resistance of the respective economies. The highest short-term spreads were observed in Romania, Hungary and for those exchange rate fixers which had not yet adopted the euro.

Following the crisis, short-term rates and their dispersion fell again in the CEE10 and by 2014 spreads over Euribor approached historical lows even in the more vulnerable countries. This reflected the general economic stabilization of the region, lower inflation and the spill-over of ultra-easy monetary policy in major advanced economies. Local currency short-term rates in IT CEE10 countries broadly followed changes in the policy rates of the respective national central banks.

Graph 3.12: International Reserves

Source: Eurostat and ECB

Graph 3.13: Short-term interest rate spreads
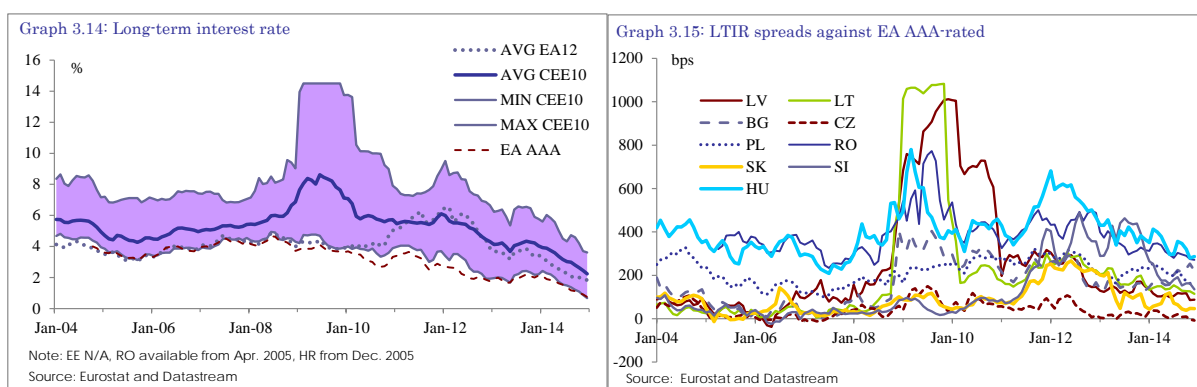
Source: Eurostat and Datastream

The exchange rate targeting CEE10 countries, together with the Czech Republic and Slovakia, achieved significant nominal convergence of long-term interest rates (LTIR) shortly after their EU accession. In case of the Baltics and Slovakia, this was also supported by expectations of early euro adoption, in an environment of insufficient risk-differentiation within the euro area. On the other hand, higher uncertainty about future nominal exchange rate levels in Poland, Romania and Hungary

kept long-term interest rates well above the EA12 level, despite some convergence in the 2004-08 period. In the case of Hungary, persistent fiscal imbalances also contributed to the higher spread.

As a precursor to the global financial crisis, sustainability concerns about Latvia's currency peg started to drive up its long-term interest rate already in 2006. During the 2008/09 crisis, long-term interest rates in the CEE10 increased to a varying degree, as cross-country differentiation by financial markets intensified. The largest increases were recorded by those countries where the crisis raised combined fiscal, financial and exchange rate stability concerns, i.e. the three countries that required international financial assistance, plus Lithuania.

Between 2009 and 2014, improving financial market confidence, low inflation and the global search for yields compressed long-term interest rates in CEE10 countries. However, the euro-area sovereign debt crisis temporarily drove up long-term yields in the CEE10 during 2011-12, with large differences among countries' LTIR spreads to the EA reflecting their perceived fundamentals. In particular, Czech and Polish yields increased less than Bulgarian, Hungarian, Romanian and Slovenian yields. Bulgaria's yields were also affected by its close links to Greece and problems of some of its domestic banks in 2014. By end-2014, the spread between the CEE10 and the euro-area (AAA) long-term yield of around 150 basis points was close to its level a decade earlier.
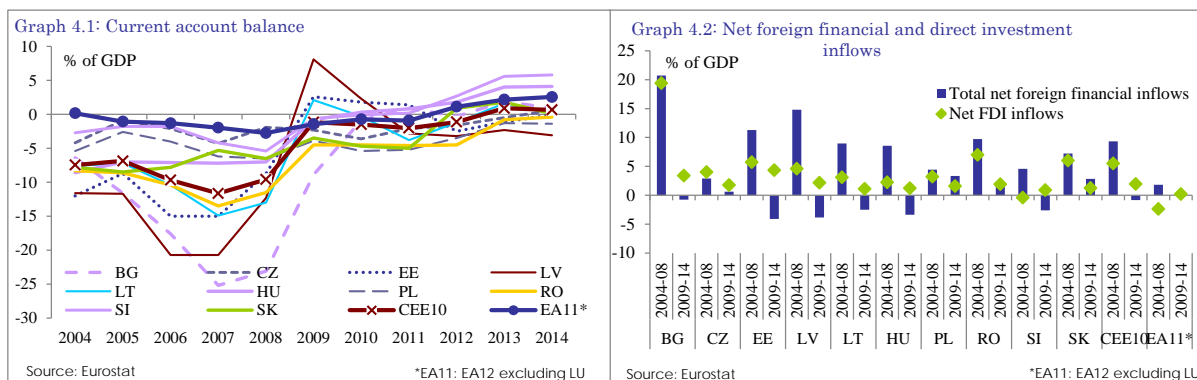

Graph 3.14: Long-term interest rate

Note: EE N/A, RO available from Apr. 2005, HR from Dec. 2005
Source: Eurostat and Datastream

Graph 3.15: LTIR spreads against EA AAA-rated

Source: Eurostat and Datastream
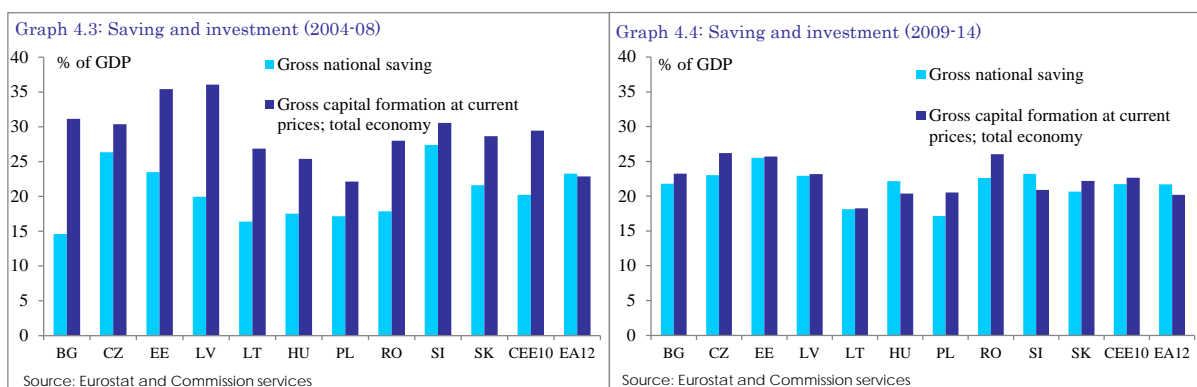
4. BALANCE OF PAYMENTS DEVELOPMENTS

Although all CEE10 countries displayed current account deficits already in 2004, their current account balances further deteriorated in the run-up to the 2008/09 global financial crisis. The average current account deficit in the CEE10 thus increased from about 7% of GDP in 2004 to almost 12% of GDP in 2007 before correcting somewhat to just below 10% of GDP in 2008. Moreover, these deficits were increasingly financed by more volatile funding flows as the average share of direct investment (which is generally considered as the most stable form of funding) in total net foreign financial inflows declined from around 70% in 2004 to about 50% in 2007 and 40% in 2008. Nevertheless, the evolution was to some extent considered natural at the time, reflecting search for higher returns amid free movement of capital, which was used to finance increased investment needs of converging economies.

The sudden stop in foreign capital inflows during the global financial crisis induced a rapid contraction of external imbalances in the CEE10 with the average current account deficit shrinking close to 1% of GDP in 2009. The difficulties to refinance their external liabilities during the global financial crisis forced Hungary, Latvia and Romania to seek official international balance of payments (BoP) assistance from the EU and the IMF in late 2008 and early 2009 while Poland was granted access to the IMF's Flexible Credit Line in May 2009. Net foreign direct investment (FDI) inflows proved to be the most reliable external funding source for the CEE10 although they on average amounted to just about 1% of GDP in 2009 (determinants of foreign capital inflows into the CEE10 countries during the 2008/09 global financial crisis are analysed e.g. in Jevcak et al. (2010)).

While the average current account balance of CEE10 countries remained negative in years 2010-2012 it recorded small surpluses in 2013 and 2014. Moreover, mainly thanks to EU funds inflows, CEE10 countries benefited from quite stable surpluses on their capital accounts which averaged almost 2% of GDP in the post-crisis period. As a result, a majority of CEE10 countries (i.e. Bulgaria, Baltic countries, Hungary and Slovenia) actually recorded net financial outflows over the period 2009-14. Although net FDI inflows remained positive in all CEE10 countries they on average amounted to some 2% of GDP in 2009-14 (after having exceeded 5% of GDP in 2004-08).

Graph 4.1: Current account balance
% of GDP
Source: Eurostat
*EA11: EA12 excluding LU

Graph 4.2: Net foreign financial and direct investment inflows
% of GDP
Total net foreign financial inflows
Net FDI inflows
Source: Eurostat
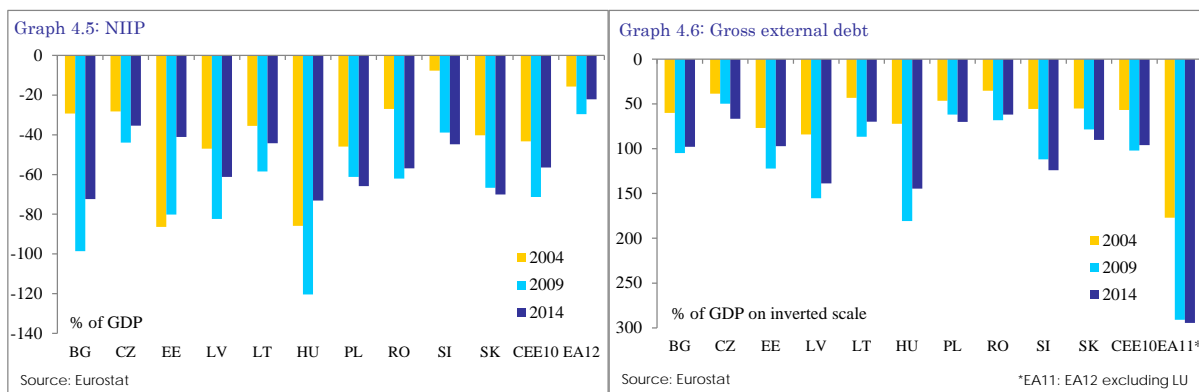*EA11: EA12 excluding LU

The improvement in the external balance of CEE10 countries in the post-crisis period was to a large extent induced by a drop in investment levels, although their gross national savings also increased somewhat. In the period 2004-08 gross capital formation averaged almost 30% of GDP across the CEE10 and exceeded 35% of GDP in Latvia and Estonia. Reflecting more constrained funding availability as well as general reassessment of the medium-term growth outlook, gross capital formation in CEE10 decreased to below 23% of GDP in the period 2009-14, falling below 20% of GDP in Lithuania. At the same time, average gross national savings in the CEE10 increased from just below 20% of GDP in 2004-08 to above 21% of GDP in 2009-14. While the gross national saving rate exceeded 20% of GDP only in the Czech Republic, Estonia, Slovenia and Slovakia in the pre-crisis period it increased to above 20% of GDP also in Bulgaria, Hungary and Romania in the post-crisis period.

Graph 4.3: Saving and investment (2004-08)
% of GDP
Gross national saving
Gross capital formation at current prices; total economy
Source: Eurostat and Commission services

Graph 4.4: Saving and investment (2009-14)
% of GDP
Gross national saving
Gross capital formation at current prices; total economy
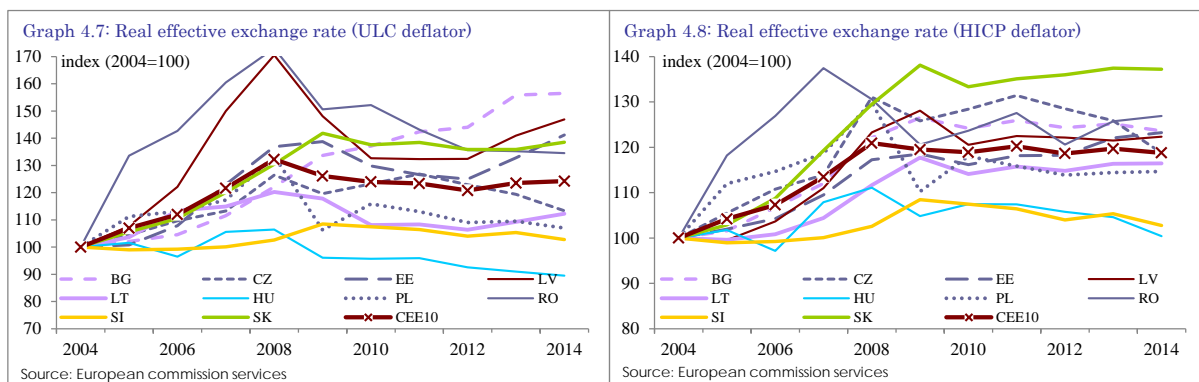Source: Eurostat and Commission services

Reflecting BoP developments, the average net international investment position (NIIP) of CEE10 countries deteriorated from -43% of GDP in 2004 to -71% of GDP in 2009 before improving gradually to -56% of GDP in 2014. At the same time, their average gross external debt peaked at 102% of GDP in 2009 and then declined close to 90% of GDP by 2013, before picking up again in 2014. Hence, apart from having substantially reduced their external vulnerability vis-à-vis possible BoP flow reversals, most CEE10 countries have in the post-crisis period also somewhat lessened their external vulnerability from the overall NIIP and gross debt ("stock") perspective. Moreover, while all CEE10 countries exhibit more negative NIIPs in comparison to the EA12 average, they have nevertheless accumulated relatively lower levels of gross external debt (even if

compared to EA11 average, i.e. EA12 excluding Luxembourg which is a special case due to its large financial sector).

Graph 4.5: NIIP
% of GDP
Source: Eurostat

Graph 4.6: Gross external debt
% of GDP on inverted scale
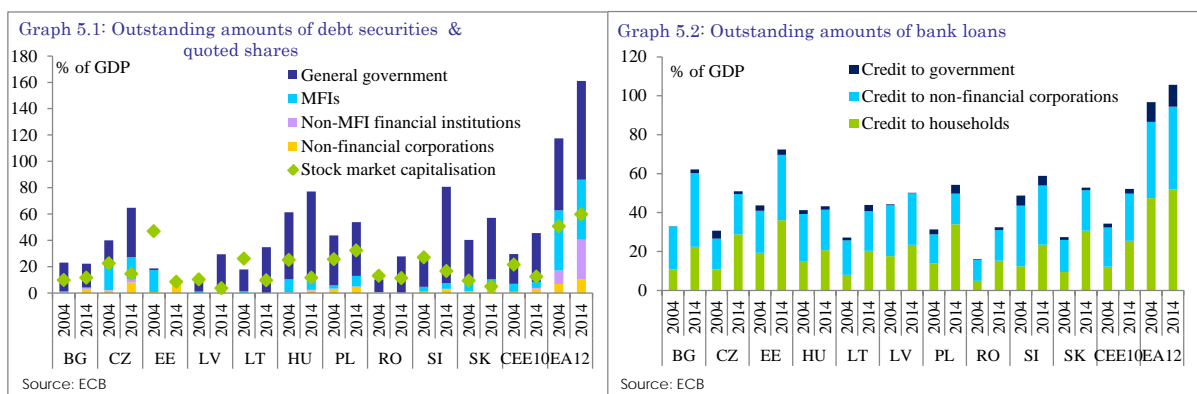Source: Eurostat
*EA11: EA12 excluding LU

The relative loss of international competitiveness in the pre-crisis period and its partial recovery afterwards, as suggested by BoP flows, was also visible in the evolution of real effective exchange rates (REERs). The REERs of all CEE10 countries appreciated between 2004 and 2008, with Romania and Latvia experiencing the strongest appreciation in ULC-based terms whereas Slovakia (REER peaking only in 2009) and Romania (REER having peaked already in 2007) recorded largest appreciations in HICP-based terms. After having in most cases depreciated somewhat over 2009 and 2010, CEE10 REERs remained in general broadly stable thereafter, with Bulgaria representing the clearest outlier as it continued to exhibit persistent trend ULC-based REER appreciation also in the post-crisis period.

Graph 4.7: Real effective exchange rate (ULC deflator)
index (2004=100)
Source: European commission services

Graph 4.8: Real effective exchange rate (HICP deflator)
index (2004=100)
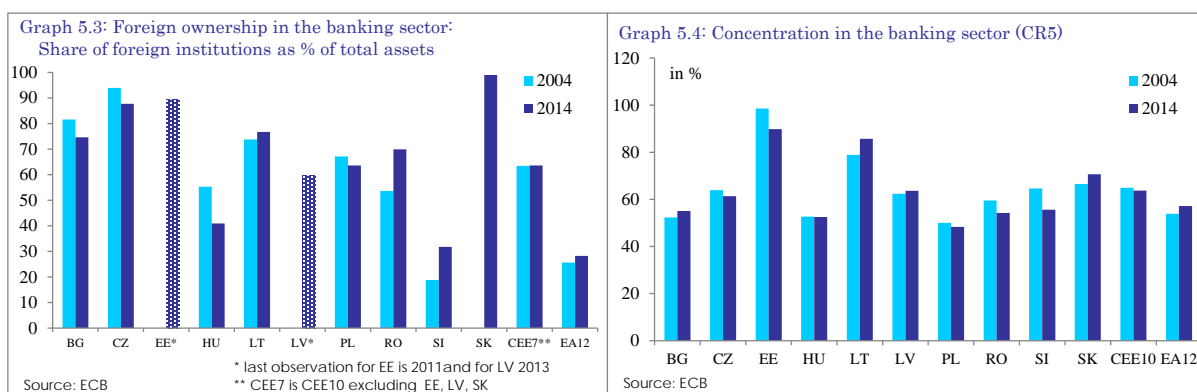Source: European commission services

Despite the substantial adjustment in BoP flows, large negative NIIPs combined with significant gross external debt levels continue to represent a potential source of external vulnerability for the CEE10. At the same time, given their relatively lower income levels and thus clear scope for further economic convergence, these countries should in principle remain attractive investment destinations if their domestic policy frameworks prove capable of ensuring a stable and profitable business environment. As a result, responsible national as well as supranational authorities need to ensure that future foreign funding inflows into the region will not endanger the overall macro-financial stability of CEE10 economies.

5. FINANCIAL SECTOR DEVELOPMENTS

CEE10 countries entered the EU with relatively underdeveloped financial sectors, at least in terms of their relative size compared to the EA12. This was the case for both market-based and banking-sector-intermediated sources of funding. In 2004, the outstanding stocks of quoted shares and debt securities amounted on average to just about 20% and 30% of CEE10 GDP, compared to around 50% and 120% of GDP in the EA12. Similarly, bank lending to non-financial sectors accounted for just some 35% of CEE10 GDP whereas it reached almost 100% of GDP in the EA12. As the government sector accounted for the majority of debt security issuance in the CEE10, bank credit represented the main external funding source for the non-financial private sector.


Graph 5.1: Outstanding amounts of debt securities & quoted shares

Source: ECB

Graph 5.2: Outstanding amounts of bank loans

Source: ECB

The CEE10 banking sectors have generally been characterised by a relatively high share of foreign ownership as well as high levels of concentration. The share of foreign-owned banks and the market share of the five largest banks (CR5) in CEE10 countries remained relatively stable over the last 10 years, on average exceeding 60%. There was however some cross-country divergence as Slovenia stood out with a relatively low share of foreign-owned banks, which only increased to above 30% in 2013. At the same time, the Estonian and Lithuanian banking sectors exhibited the highest levels of concentration, with their respective CR5 averaging 94% and 82% over 2004-14. On the other hand, the role played by foreign-owned banks is rather limited in most EA12 countries while their banking sectors are in general also somewhat less concentrated, with their CR5 averaging around 55% over the last 10 years.

Graph 5.3: Foreign ownership in the banking sector: Share of foreign institutions as % of total assets

Source: ECB

* last observation for EE is 2011and for LV 2013
** CEE7 is CEE10 excluding EE, LV, SK

Graph 5.4: Concentration in the banking sector (CR5)

Source: ECB

Whereas banks from the EA12 have played a prominent role in the Central and South-Eastern European CEE10 countries, Scandinavian banks have dominated in the three Baltics. The significant role played by parent banks from EU15 in the CEE10 region facilitated cross-border financial integration by serving as a conduit for foreign capital inflows. However, while these inflows helped to finance/support the real convergence process they also facilitated the build-up of macroeconomic imbalances and financial sector vulnerabilities (as also emphasised by e.g. Roaf et al.

(2014)). At the same time, high levels of concentration might have strengthened the price-setting power of largest banks and thus bolstered their shock absorption capacity.

The relatively small size of financial markets presented ample scope for further financial deepening, which initially advanced at a rapid pace in the bank-intermediated segment of CEE10 funding markets. The stock of bank loans to the non-financial private sector (NFPS) in the CEE10 tripled (in euro terms) between May 2004 and May 2009 with lending to households almost quadrupling, while lending to non-financial corporations more than doubled. There was nevertheless a considerable degree of cross-country divergence, as bank credit to the NFPS expanded to more than 400% of its May 2004 level in the three Baltic countries as well as in Bulgaria and Romania but to less than 300% in the rest of the region.
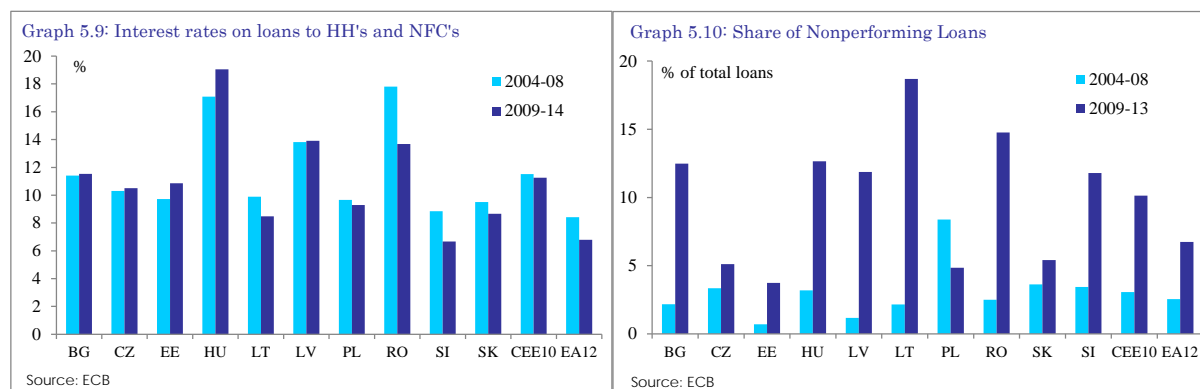

Graph 5.5: Bank Lending to Households

Graph 5.6: Bank Lending to Non-Financial Corporations
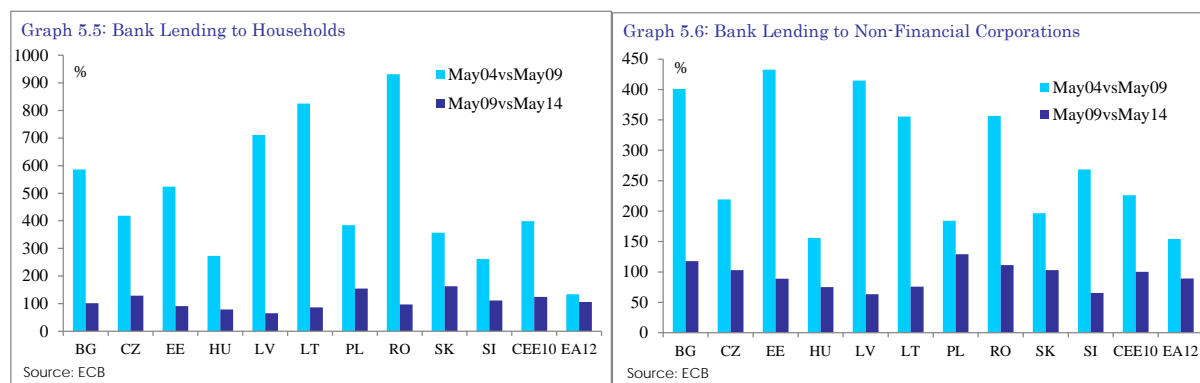
In some CEE10 countries, new bank credit was to a large extent denominated in foreign currencies (FX), notably in euros or in Swiss francs, which was particularly problematic in the case of households lacking any FX income. Although the share of FX-denominated loans to households already exceeded 50% in Latvia and Estonia at the time of their EU entry in 2004, the FX share was above 50% in all three Baltic countries as well as in Hungary and Romania at the height of global financial crisis in 2008/09. This represented an additional macro-financial vulnerability for the concerned countries, as local banking sectors needed to maintain access to FX funding in order to refinance their loan portfolios while the conduct of macroeconomic policy was constrained by the possible financial stability risks that could be associated with excessive exchange rate movements (or realignments in the context of fixed exchange rate systems). As a result, with the exception of Bulgaria, the share of FX loans to households declined throughout the region in the post-crisis period. Given the dominant role of euro in their FX loans portfolios, the entry of all three Baltic countries into the euro area implied that currency denomination of these portfolios became largely domestic-currency-based.

Graph 5.7: Share of foreign currency loans to HH's

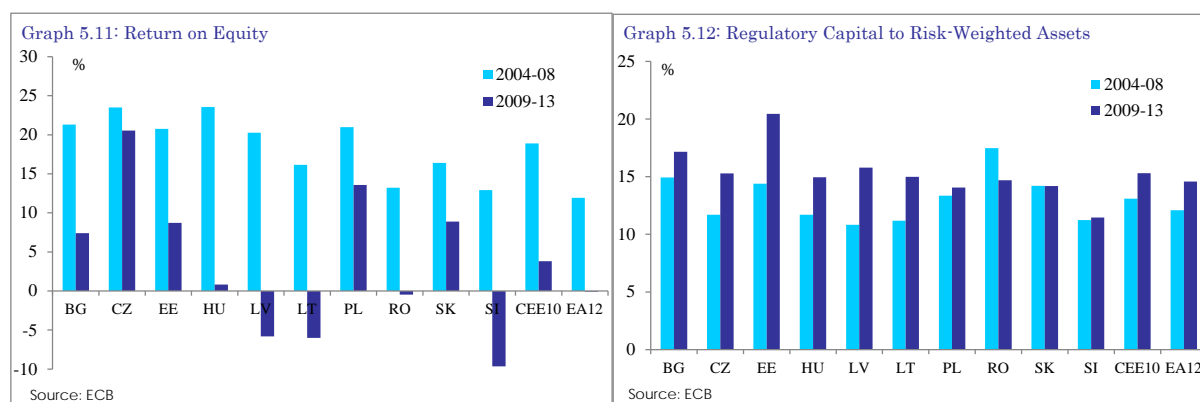Graph 5.8: Share of foreign currency loans to NFC's
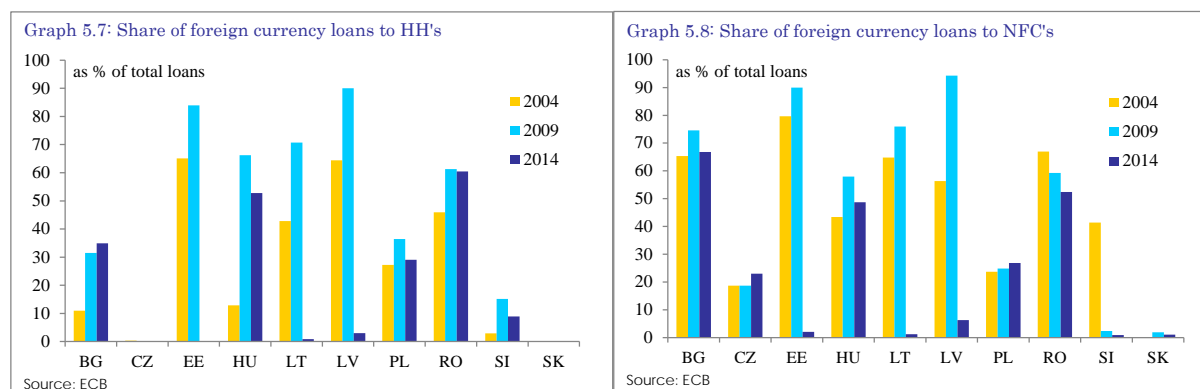
The 2008/09 global financial crisis not only represented a major negative shock but also proved to be a structural break in the overall evolution of bank lending to the non-financial private sector in the CEE10. As the pace of credit growth in the pre-crisis period was clearly excessive and

unsustainable, a post-crisis correction was natural and unavoidable. However, credit to the NFPS increased by "only" some 13% between May 2009 and May 2014, with bank lending to the non-financial corporate sector basically stagnating while lending to the household sector expanded by about 25%.

The significant slow-down of credit growth does not seem to be driven by increased costs of bank lending. Interest rates on loans to nonfinancial private sector remained broadly stable, averaging 12% over 2004-08 and 11% over 2009-14. The marginal decline reflects an extraordinary loosening of policy stance by all major central banks in the aftermath of the 2008/09 as well as policy actions taken by inflation-targeting central banks in the CEE10 region in view of considerably dampened inflationary pressures.
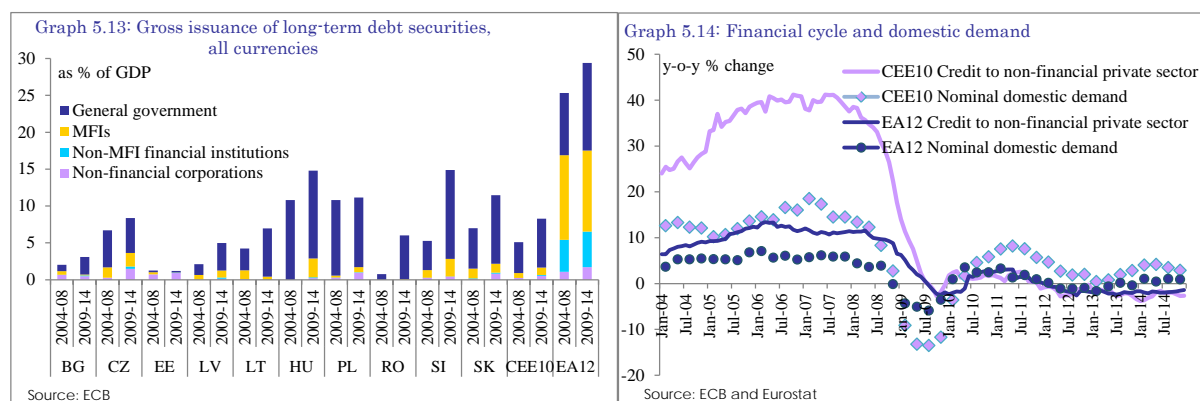

Graph 5.9: Interest rates on loans to HH's and NFC's

Source: ECB

Graph 5.10: Share of Nonperforming Loans

Source: ECB

The sluggish evolution of bank lending in the post-crisis period likely reflects a mixture of internal and external factors. The crisis surely induced a credit-risk-reassessment on the side of both lenders and potential borrowers as perceptions of prospects for the pace and persistence of the convergence process deteriorated. Moreover, the 2009 recession followed by relatively slow economic recovery and worsened labour market conditions induced an increase in the share of non-performing loans (from some 3% in 2004-2008 to about 10% in 2009-13) and thus also negatively affected the profit-generating capacity of local banking sectors. As a result, the average RoE across the region reached less than 4% in the post-crisis period after having recorded almost 19% in the pre-crisis years. Nevertheless, local banking sectors remained well capitalised (as average CAR increased from around 13% in 2004-08 to above 15% in 2009-13), in some cases thanks to support of their foreign parent institutions. At the same time, euro-area financial market turbulences, capital constrains of parent banks and weak export market performance undoubtedly also hampered bank credit expansion in CEE10 countries.

Graph 5.11: Return on Equity

Source: ECB

Graph 5.12: Regulatory Capital to Risk-Weighted Assets

Source: ECB

Although the use of market-based funding in the CEE10 region did expand in the post-crisis period, it still remains relatively minor outside of the government sector. Gross issuance of long-term debt securities amounted on average to about 5% of GDP in 2004-08 before increasing to around 8% of GDP in 2009-14. It thus remained far below the EA12 average (29% of GDP in 2009-14). It

also continued to be largely dominated by the general government sector, whose issuance increased from some 4% of GDP in 2004-08 to above 6% of GDP in 2009-14, mainly reflecting larger public deficits in the post-crisis period (for a discussion of the fiscal position see Subsection 3.2). As a result, the banking sector preserved its dominant role in funding of private sector investment needs in the CEE10 region.

Graph 5.13: Gross issuance of long-term debt securities, all currencies

Source: ECB

Graph 5.14: Financial cycle and domestic demand

Source: ECB and Eurostat

The strong correlation between financial and economic cycles in the CEE10 region offers an important perspective on the sustainability and underlying drivers of the convergence process which may have been somewhat underestimated in the pre-crisis period. Robust credit growth supports economic activity as it enables financing of new investments as well as higher consumption levels, while a pick-up in economic activity tends to increase demand for credit as earning prospects improve. On the other hand, in the economic downturn, excessive indebtedness weighs on credit demand as well as on domestic consumption and investment. Despite these apparent strong feedback loops between the two cycles, real convergence and financial deepening were often perceived as two separate and not necessarily closely-related processes in the pre-crisis period.

According to the (neo)classical economics, real convergence occurs due to the incentive for capital to flow "downhill", i.e. from more to less developed economies, as the availability of cheaper labour force combined with superior technology embodied in capital transfers implies higher returns on capital. Resulting capital inflows to less developed economies raise labour productivity and thus domestic income levels. This process however does not necessitate the existence of a banking sector nor bank-credit-financed debt creation (as capital could be transferred e.g. within the corporate sector as FDI or inter-company lending).

On the other hand, inter-temporal models of consumption optimisation suggest that consumers have an incentive to smooth their consumption levels over time in order to maximise their life-time utility and thus to debt-finance their consumption if they assume that their future (average life-time) earnings will exceed current levels. Similarly, producers expecting a continuous future growth of demand for their products have an incentive to debt-finance an expansion of their production capacities in order to preserve their market shares.

Looking ahead, it is clear that the interaction between financial cycles and the process of real converge should remain under closer scrutiny. A number of studies (see e.g. Eichengreen and Arteta (2000) or Schularick and Taylor (2012)) identified bank credit as one of (or the) most reliable predictors of financial crisis. Moreover, institutional reforms (such as the creation of the ESRB or the introduction of the MIP) were adopted in the EU in the aftermath of the global financial crisis to i.e. ensure that policy makers remain alerted to potentially fragile feedback loops between financial and real economic developments.
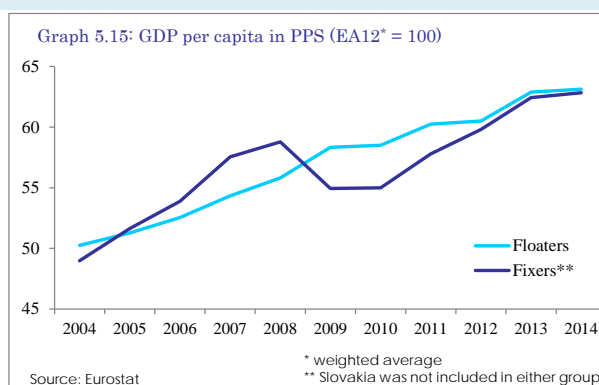
This box discusses whether the choice of exchange rate regime – i.e. fixed or floating – seems to have commonly affected economic performance of CEE10 countries over the past decade.[13] One of the main policy challenges for the CEE10 has been to manage economic catching-up and the accompanying price level convergence. In this context, the importance of nominal exchange rate flexibility, and more broadly, independent monetary policy under the constraint of free capital movement within the EU is often disputed. For small open economies with tradition of exchange rate stability and/or a strong political will to adopt the euro as early as possible, fixing the exchange rate seemed to be the natural choice. For other countries, a floating exchange rate appeared to be more appropriate, offering some policy leeway to achieve price stability under free capital mobility (see e.g. Darvas and Szapáry (2008)).

In this context, the question regarding the impact of euro adoption on the economic performance of these countries also arises. It should however be noted that out of the five CEE10 countries which have adopted the euro by 2015, four (i.e. Estonia, Latvia, Lithuania and Slovenia) already operated under fixed exchange rate regimes in 2004. In their case, euro adoption did not represent an essential regime change with respect to the role of nominal exchange rate flexibility in the convergence process vis-à-vis the EA12. Moreover, given that their respective euro adoption dates range from 2007 to 2015, their euro-area experience mostly captures only a part of the last economic and financial cycle. Similarly, Slovakia, the only floater which has so far adopted the euro, entered the euro area in 2009 and thus the difference in its economic performance pre- and post- euro adoption is fully correlated with the significant impact of the 2008/09 global financial crisis.[14] As a result, the available sample period appears to be too short and biased to draw any specific conclusions about the impact of euro adoption on these countries.

Based on the GDP per capita in PPS data, there was no significant difference in the speed of real income convergence to the EA12 between fixers and floaters over the past decade, but there was a large degree of heterogeneity within both groups. Rather than the type of exchange rate regime, a more important relationship existed between the speed of catching-up and the initial income level, with less developed countries in general converging at a faster pace. Accordingly, the fastest growing economies were, among the fixers, the three Baltic countries and, among the floaters, Poland and Romania. In addition, Slovakia, which recorded one of the best catching-up performances, floated its currency until euro adoption in 2009 and the bulk of its real convergence over the past decade actually materialised before 2009.

The real convergence path of floaters was in general smoother than that of fixers. This was mainly due to the more pronounced economic overheating in the latter group prior to 2008, which then also led to a larger set back during the financial crisis (for a more detailed discussion of the Baltics' experience see e.g. European Commission (2010)). Nevertheless, fixers were able to again largely close their GDP-gap to floaters by 2012, as they enjoyed an export-led recovery, supported by internal price adjustment, structural reforms and favourable export market developments.

Graph 5.15: GDP per capita in PPS (EA12* = 100)

Floaters

Fixers**

* weighted average
** Slovakia was not included in either group

Source: Eurostat

The extent of price level convergence over the last decade mainly reflected differences in the speed of catching-up. That said, the average household consumption price level of fixers remained close to that of floaters until 2008, but it became significantly higher in the post-crisis period, as comparative prices of floaters fell. In this context, it should be noted that it might be difficult to consistently separate real and nominal convergence (e.g. due to differences in sample selection or quality adjustment) as possibly indicated by the contrast between the performance of the Czech Republic and Poland: whereas the former was one of the laggards in terms of the speed of real convergence, but experienced significant price convergence, the latter was one of the fastest in real convergence and one of the slowest in price convergence.

---

[13] Bulgaria, Estonia, Latvia, Lithuania, Slovenia and from 2009 also Slovakia are treated as fixers whereas the Czech Republic, Hungary, Poland, Romania and prior to 2009 Slovakia are considered as floaters. See Box 1 for a short description of monetary policy frameworks adopted by CEE10 countries.

[14] Nevertheless, comparing the performance of Czech and Slovak economy during the 2008/09 global financial crisis and in its immediate aftermath, Jevčák (2011) suggests that both economies continued to evolve in a highly similar manner.

Floaters appear to have been in general able to benefit from their monetary autonomy to achieve a higher degree of price stability. In the pre-crisis period, faster growth and related overheating gradually drove up inflation in fixers significantly above the average inflation rate of floaters. Subsequently, larger output drops and the inability to depreciate against the euro implied that fixers generally also experienced more pronounced disinflation. From late-2010, inflation in the two groups developed quite similarly on average, but the variance was higher among floaters.

During 2004-08, credit growth rates were highest in the Baltics, Bulgaria and Romania, i.e. predominantly in fixers. However, these were also countries with the lowest initial bank lending levels at the start of the credit cycle (which in some cases occurred well before EU-accession) implying a larger potential for credit boom when new market players aimed to take advantage of the anticipated catching-up of these countries within the EU. In 2009-14, the most significant deleveraging took place in the Baltics, Slovenia and Hungary, i.e. again mainly fixers, clearly linked to the excesses of the pre-crisis period. There were nevertheless considerable differences among countries (and also across time) regarding e.g. the currency-denomination of lending, use of macro-prudential tools, bank ownership or tax incentives, which make it difficult to directly associate the volatility of the credit cycle with the type of exchange rate regime.

Over the past decade the benchmark long-term interest rate on government bonds was higher on average for floaters than for fixers, both nominally and in real terms. This is partly a consequence of the higher average public debt level among the floaters, but to some extent it is arguably also related to more exchange rate uncertainty inherent in floating. In 2014, public debt of floaters was on average more than ten GDP percentage points higher than the average for fixers, which however recorded a larger increase since 2004. In particular, between 2008 and 2014, public debt increased almost twice as much in GDP terms for fixers (by about 25 percentage points) than for floaters.

In the pre-crisis period, the cost competitiveness of floaters deteriorated due to the appreciation of the local currencies while the cost competitiveness of fixers was undermined by rapidly rising prices of locally produced tradable goods. After the crisis, fixers had to adjust via domestic prices while floaters benefited from weaker nominal exchange rates, with the size of the necessary adjustment in both groups closely linked to the extent of earlier imbalances in each country. Generally, it takes longer to regain cost competitiveness via internal price adjustment than via nominal exchange rate depreciation and the initial shock to the real economy is more severe. However, the internal adjustment is more permanent as it requires a structural solution to the underlying problems, whereas the temporary boost generated by nominal exchange rate depreciation can actually postpone the reforms necessary for further sustained catching-up.

Generally, the experience with using the floating exchange rate and own monetary policy for management of the economic cycle is mixed in CEE10 countries suggesting that it largely depends on the strength of the individual country's fundamentals and the credibility of its other policies. During 2004-08, floating exchange rates appreciated (except for Hungary) and thus dampened domestic inflationary pressures stemming from high capital inflows and excessive optimism. However, when the 2008/09 global financial crisis induced nominal depreciation of CEE floating currencies, those countries that had accumulated significant foreign-currency debt were hit by an increase in the debt burden and the related destabilization of the financial sector. As a result, both Hungary and Romania had to seek international financial assistance in late 2008 and early 2009. At the same time, the sudden stop of external financing had also a strong negative impact on fixers as the credibility of their pegs weakened and exchange rate risk reappeared in the eyes of potential investors, forcing Latvia to require international financial assistance as well.

CONCLUSIONS

A majority of CEE countries which entered the EU in 2004 and 2007 achieved significant real convergence vis-à-vis the EA12 between 2004 and 2014. Average real GDP growth in the CEE10 was strong prior to the 2008/09 global financial crisis, but it declined considerably in the post-crisis period. Moreover, a sizeable real convergence gap, in terms of average GDP per capita in purchasing power standards, still exists between the CEE10 and the EA12. At the same time, it has to be kept in mind that the CEE10 region itself covers a diverse group of countries which differ considerably in terms of their real per capita incomes. In general, CEE10 countries which entered the EU with lower income levels seem to have converged somewhat faster.

The rapid pace of economic convergence in the pre-crisis period partly reflected an investment boom but the contribution of investment activity to real convergence was not sustained in the post-crisis period. The pre-crisis investment boom was stimulated by optimistic growth expectations and supported by external funding availability. In the post-crisis period, growth prospects were reassessed and private funding tightened but investment activity in the region was still supported by substantial inflows of EU funds.

The openness of CEE10 economies to trade improved considerably between 2004 and 2014 while their goods exports to the EA12 also increased. As a result, CEE10 countries appear in general well integrated with the EA12 through their exports. However, the relevance of goods exports to the EA12 varies considerably across the CEE10.

Most CEE10 countries also recorded substantial progress in terms of nominal convergence. Over the last decade, five out of ten CEE countries fulfilled the accession criteria and subsequently joined the euro area. The average annual inflation rate in the region exceeded 5% in the pre-crisis period and peaked at above 8% in 2008 as the inflationary impact of rapid economic expansion was exacerbated by the 2007/08 global commodity price boom. Inflation rates have remained generally moderate in the post-crisis period, reflecting more favourable global commodity price developments as well as more subdued growth performance. Nonetheless, despite considerable convergence, there still remains a sizable price-level gap vis-à-vis the EA12, which is larger for non-traded goods. One of the key challenges for the CEE10 will thus be to preserve low inflation rates while at the same time succeeding in reinvigorating the pace of real convergence in the coming years.

The 2008/09 global financial crisis had a significant negative impact on fiscal positions of most CEE10 countries. The parallel deterioration in financial conditions, which *inter alia* forced Hungary, Latvia and Romania to seek official international balance of payments assistance from the EU and the IMF, revealed that despite in most cases relatively lower (compared to the EA12 average) general government debt levels, some CEE10 countries might still encounter problems to (re-)finance their public sector borrowing needs during periods of heightened financial market tensions. General government balances largely improved in the post-crisis period as substantial fiscal consolidation measures were supported by the ongoing economic recovery. As a result, only two CEE10 countries remained under the EDP by end-2014.

CEE10 countries operating under fixed exchange rate systems were successful in maintaining the stability of their currencies to the euro. However, the nominal stability of the exchange rate sometimes masked underlying changes in economic fundamentals and market sentiment. In particular, considerable domestic policy efforts were required during the global financial crisis and in its aftermath to support these exchange rate arrangements. On the other hand, most floating currencies followed an appreciating trend vis-à-vis the euro in the pre-crisis period. Subsequently, they depreciated significantly during the 2008/09 global financial crisis. After having recovered somewhat by early 2010, they remained broadly stable up to end-2014, with the forint and the leu following a shallow depreciating trend to the euro while the Czech National Bank weakened the koruna in late 2013 by establishing a currency ceiling to the euro in order to provide additional monetary stimulus.

Interest rate convergence was quite advanced in some Member States already at the time of EU accession and it thereafter progressed further, in particular in those countries which were on track to adopt the euro, similarly to the excessive interest rate convergence observed within the euro area. The crisis brought about increased risk differentiation by financial markets, but the subsequent improvement in macro imbalances and the global search for yield gradually eliminated most of the increase in spreads by the end of the reviewed period.

External imbalances of CEE10 economies, which in most cases widened in the pre-crisis period, corrected abruptly during the global financial crisis and then remained quite subdued in the post-crisis period. The improvement was to a large extent induced by a drop in investment although gross national savings also increased somewhat. REER developments confirm that international price competitiveness of the CEE10 deteriorated somewhat in the pre-crisis period before broadly stabilising in recent years. Nevertheless, despite the substantial adjustment in BoP flows, large negative NIIPs combined with significant gross external debt levels continue to represent a potential source of external vulnerability for the region.

All CEE10 countries entered the EU with relatively underdeveloped financial sectors, at least in terms of their relative size compared to the EA12. Bank-intermediated funding, which also benefited from a large share of foreign ownership in the sector, initially expanded at a rapid pace and thus supported domestic demand growth. However, growth of credit to the non-financial private sector slowed down considerably after the 2008/09 global financial crisis as external funding tightened and real convergence prospects were reassessed. On the other hand, the use of market-based funding in the CEE10 region expanded in the post-crisis period but remained relatively minor outside of the government sector. Looking ahead, it is clear that the interaction between financial cycles and the process of real converge in the CEE10 should remain under closer scrutiny. In particular, in order to preserve financial stability, the responsible national and supranational authorities need to prevent a build-up of an unsustainable bank-credit-financed consumption and investment boom.

The evolution of policy rates set by CEE10 central banks targeting inflation under floating exchange rates (that is in the Czech Republic, Hungary, Poland, Romania and up to 2009 in Slovakia) reflected the overall course of domestic economic and financial cycles in these countries. After having reached their troughs in 2005 and in early 2006, policy rates were raised between 2006 and 2008 in view of heightened inflationary pressures reflecting the rapid pace of economic expansion, buoyant credit growth as well as the global commodity price boom. Between late 2008 and early 2010 policy rates were gradually decreased again as the global financial crisis temporarily hampered economic activity, led to a credit freeze and suppressed global commodity prices. Another wave of policy rate cuts by inflation-targeting central banks was launched around mid-2012 as inflationary pressures throughout the region eased further.

In general, the choice of exchange rate regime – i.e. fixed or floating – does not seem to have been the deciding factor for economic performance of CEE10 countries over the past decade. This suggests that the capacity to use the floating exchange rate and own monetary policy for management of the economic cycle, which was in some cases hampered by foreign-currency denominated bank lending, high external debt levels and/or imprudent fiscal policy, largely depends on the strength of the individual country's fundamentals and the credibility of its other policies. In particular, the impact of the 2008/09 global financial crisis on CEE10 countries clearly reflected the size of accumulated imbalances, rather than a specific type of exchange rate regime. Consequently, both Hungary and Romania among floaters and Latvia as fixer had to seek international financial assistance.

REFERENCES

Balassa, B. (1964), "The Purchasing Power Parity: A Reappraisal", Journal of Political Economy, 72(6), 584-596.

Berka, M. and M. Devereux (2010), "What Determines European Real Exchange Rates?", NBER Working Paper 15753, National Bureau of Economic Research.

Roaf J., R. Atoyan, B. Joshi, K. Krogulski and an IMF staff team (2014), "25 Years of Transition: Post-Communist Europe and the IMF", Regional Economic Issues, Special Report, International Monetary Fund, Washington, DC.

Dabrowski, M. (2014), "Central and Eastern Europe: Uncertain Prospects of Economic Convergence", BRUEGEL blog.

Darvas, Zs. and Gy. Szapáry (2008), "Euro Area Enlargement and Euro Adoption Strategies", Economic Paper 304, European Commission, Brussels.

EBRD (2013), "Transition Report 2013: Stuck in Transition?", European Bank for Reconstruction and Development, London.

Égert, B., I. Drine, K. Lommatzsc, and C. Rault (2003), "The Balassa-Samuelsson Effect in Central and Eastern Europe: Myth or Reality?", Journal of Comparative Economics, 31, 552-572.

Eichengreen, B., and C. Arteta (2000), "Banking Crises in Emerging Markets: Presumptions and Evidence", Center for International and Development Economics Research (CIDER) Working Papers, No C00-115, University of California, Berkeley.

European Commission, DG ECFIN (2010), "Cross-country Study: Economic Policy Challenges in the Baltics", Occasional Paper 58, European Commission, Brussels.

Jevčák, A. (2011), "Did Nominal Exchange Rate Flexibility Matter During the Global Recession? A Czech and Slovak case study", ECFIN Economic Brief 14, European Commission, Brussels.

Jevčák, A., R. Setzer and M. Suardi (2010), "Determinants of Capital Flows to the New EU Member States Before and During the Financial Crisis", Economic Paper 425, European Commission, Brussels.
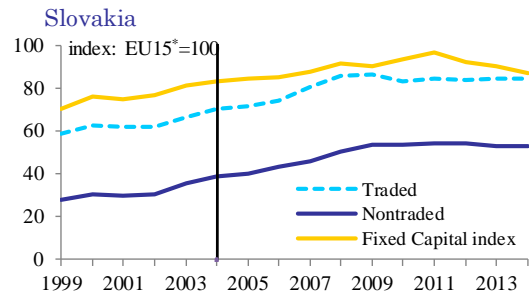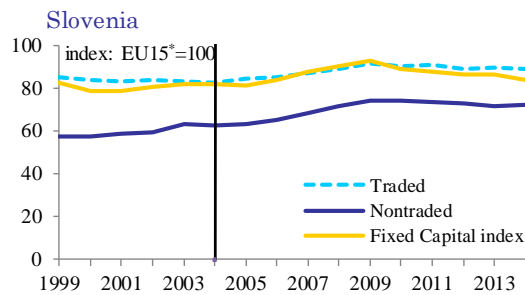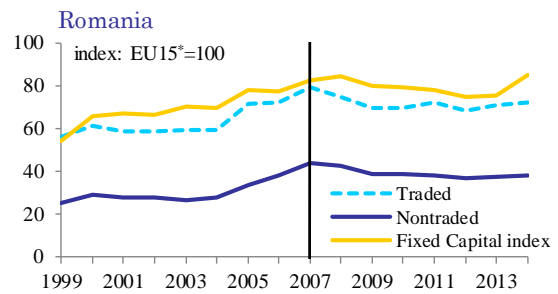
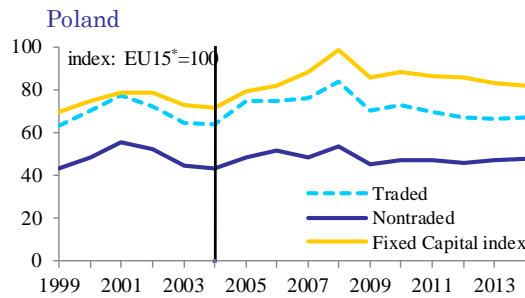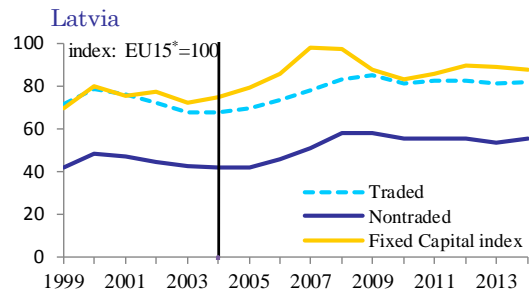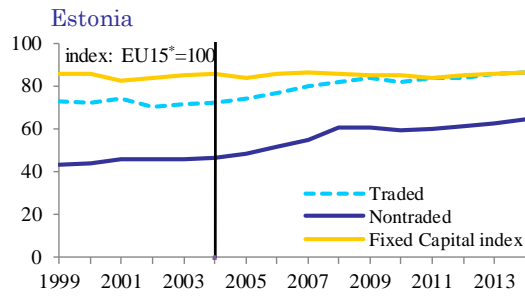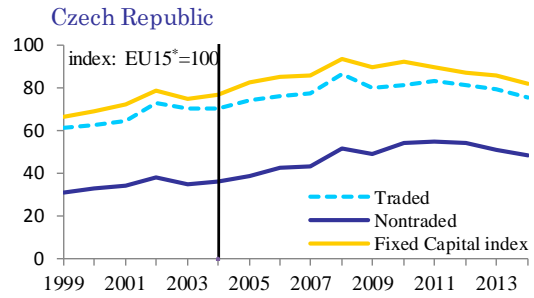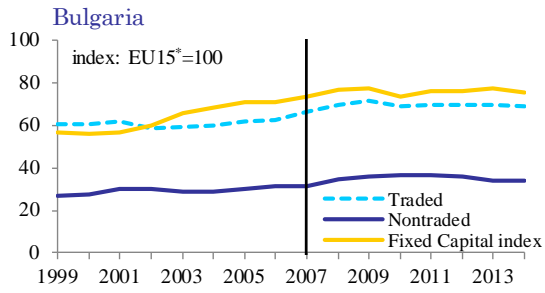Mihaljek, D. and M. Klau (2008), "Catching-up and Inflation in Transition Economies: the Balassa-Samuelson Effect Revisited", BIS Working Papers, No 270, Bank for International Settlements, Basel.

Samuelson, P. (1964), "Theoretical Notes on Trade Problems", The Review of Economic and Statistics, 46(2), 145-154.

Schularick, M. and A. M. Taylor (2012), "Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870-2008," American Economic Review, American Economic Association, 102(2), 1029-61.

ANNEX

Relative Price indices

Bulgaria

index: EU15*=100

- - - - Traded
—— Nontraded
—— Fixed Capital index

Czech Republic

index: EU15*=100

- - - - Traded
—— Nontraded
—— Fixed Capital index

Estonia

index: EU15*=100

- - - - Traded
—— Nontraded
—— Fixed Capital index

Latvia

index: EU15*=100

- - - - Traded
—— Nontraded
—— Fixed Capital index

Lithuania

index: EU15*=100

- - - - Traded
—— Nontraded
—— Fixed Capital index

Hungary

index: EU15*=100

- - - - Traded
—— Nontraded
—— Fixed Capital index

Poland

index: EU15*=100

- - - - Traded
—— Nontraded
—— Fixed Capital index

Romania

index: EU15*=100

- - - - Traded
—— Nontraded
—— Fixed Capital index

Slovenia

index: EU15*=100

- - - - Traded
—— Nontraded
—— Fixed Capital index

Slovakia

index: EU15*=100

- - - - Traded
—— Nontraded
—— Fixed Capital index

Source: Eurostat and Commission services calculations

* weighted average

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