

## Monetary and financial integration in EU10 countries

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### Introductory remarks

This study analyses two different but interconnected aspects of late transition process in EU10 countries. With the collapse of the Council for Mutual Economical Assistance (CMEA), former satellite states in Central and Eastern Europe immediately swapped economic and political relations from the mouldering Soviet Union to the Germany leaded West. Convergence lies in the heart of EU policies, the developments in the functioning of monetary policies in EU10 countries can also be understood as an institutional catching up process. Efficient functioning of the financial markets plays a vital role in the integration process but financial markets in transition countries have been severely constrained by the lack of knowledge about cross-country risk-sharing and institutional deficiencies and lack of acquaintance of financial instruments. Moreover, the absence of adequate government support and regulatory back-up can also hinder the growth of fundamental financial market institutions.

### Monetary policy in EU10 countries

After the regime change monetary policy has played an important role in the EU10 countries with inevitable policy and institutional changes, including the construction of independent central banks. Centrally planned economies often used substantial price distortions that were an established custom among CMEA members before. Regarding the monetary system of EU10 countries an essential question emerged whether to use monetary aggregates of fixed exchange rates as the basis for monetary policy and especially for stabilization. In several countries the technical assistance of the IMF was used to adopt and revise central bank laws because on the one hand central bank autonomy and accountability required strong legislation, and on the other hand establishing the credibility of monetary policy was a crucial issue. According to the IMF (2014) report the choice of the nominal anchor played a vital role in determining stabilization paths. The commitment to introduce fixed exchange rates was obvious and technically easy to implement. The exchange rate peg was able to break down hyperinflationary spirals and helped implementing fiscal adjustments and it was also useful when countries faced vulnerable external positions. The alternative could have been money-based stabilization; a monetary aggregate target could have also helped maintaining decreasing inflationary paths. Furthermore, given the flexible exchange rates, money-based approaches are better solutions than flexible exchange rates to absorb external and real shocks.

#### *Exchange rate regimes in EU10 countries*

From a theoretical point of view several factors can determine exchange rate regime choices. Markiewicz (2006) differentiates three main approaches: the traditional approach is based on the optimum currency area theory and its extension, the concept of the “impossible trinity” (see later). The second one is the currency crisis approach, and finally – as a third option - the choice of exchange rate regimes can be analysed through a political economy view. The optimum currency area theory pioneered by Mundell’s, Kenen’s and McKinnon’s work compares the fixed and flexible exchange rates in terms of trade and welfare gains, and states that fixed exchange rates are

more suitable for countries characterized by high degree of trade openness because of increasing trade gains. Moreover, geographical proximity usually determines a country's trade relations and therefore favours pegging its currency to the largest trading partner. The impossible trinity holds that it is impossible to have all three of the following at the same time – fixed exchange rate, free capital movement and independent monetary policy. Since free capital movement can be considered as a given option due to growing importance of capital movement among countries at global and especially at regional level, furthermore the European Union's notion of four freedoms is committed to diminish constraints on intra-European capital movements, for the EU10 countries only two policy combination options remained. First, fixed exchange rates and the loss of conducting independent monetary policy, second, flexible exchange rates and independent monetary policy.

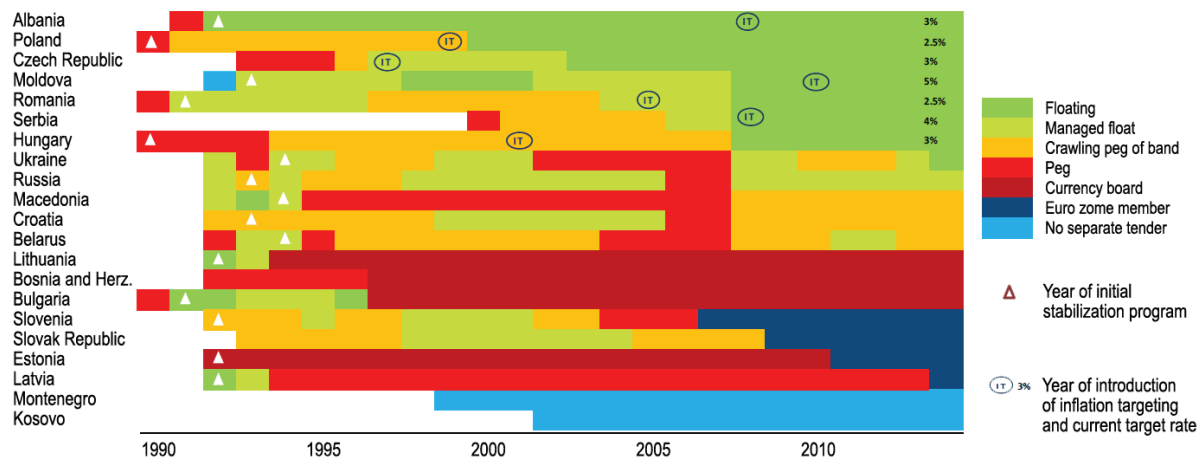
The importance of the second, currency crisis approach appears when a country applies fixed exchange rates with chronic balance of payments deficits. The vital question in this situation is whether a country's central bank owns enough foreign exchange reserves to maintain the fixed exchange rate regime. Krugman (1979) emphasized that currency crises – first generation currency crises – are the consequence of weak economic fundamentals, in a fixed exchange rate regime monetary expansion or fiscal expansion leads to a persistent loss of international reserves, and to a speculative attack on the currency, and finally to the abandonment of the fixed exchange rate. Schardax (2002) analysed the exchange rate crises of the 1990s in Central European countries and concluded that Krugman's theorem of first generation currency crises described properly the developments in these countries. According to second generation models of currency crises, expectations – sometimes of self-fulfilling kind – of monetary policy or economic policy can lead to currency crisis. For instance, increase in the public deficit, public gross debt and other deteriorating economic variables are able to negatively influence investors. In this way sovereign default risks start rising and on the one hand investors withdraw capital from the country, on the other hand speculative attacks will try to enforce abandoning the parity. Finally, the country chooses flexible exchange rates. EU10 countries aimed to join the euro area, so at the same time they had to comply with the convergence criteria, one of which implies participation in the exchange-rate mechanism (ERM II) for two consecutive years. This means that applicant countries should not devalue the currency for two years, and cope with temporary speculative attacks on their currencies.

The mentioned third approach takes a political economy view into account: the credibility gains associated with fixed exchange rate regimes. Imported price stability as a consequence of the peg seemed to be a useful instrument to convince domestic citizens of the economic successes. Thus weak governments may choose to use fixed exchange rates to eliminate pressures.

Regarding the credible exchange rate system, Farkas (2010) points out that there were only two alternatives, hard peg and the import of low-level inflation rate, or flexible exchange rate. Therefore mixed exchange rate regimes were ruled out. Initially, several countries such as Bulgaria, Czech Republic, Estonia, Hungary, Poland and Romania introduced fixed exchange rate regimes, choosing an external anchor to break down high inflation rates. Latvia and Lithuania at an early stage used flexible exchange rates. However, Slovakia and Slovenia opted for a mixed exchange rate regime – crawling peg or band. Estonia successfully applied a fixed regime, namely the currency board which is a credible monetary authority where the governments cannot print money, the currency board can only earn interest on foreign reserves, and the central bank does not act as a lender of last resort. In sight of the currency board in Estonia, Lithuania also changed its exchange rate regime from floating to currency board, and the third Baltic state, Latvia introduced a peg. Bulgaria had sustained the fixed regime for a year then tried to apply flexible regimes – float and managed float – but in 1997 introduced a currency board (see Figure 1). At the end of the 1990s and the beginning of the 2000s several larger Central European states moved

to flexible exchange rates from fixed ones through mixed regimes: the Czech Republic started floating in 1996, Poland in 1998, Romania in 2003, and finally, Hungary in 2008. In 2008, Slovenia, joined the Eurozone, and delegated the conduct of monetary policy to the community level. Following Slovenia, Slovakia, Estonia and Latvia also joined the euro system, and the accession of Lithuania will take place in January 2015.

Figure 1: Exchange rate regimes in transition countries



Source: 25 Years of transition (IMF)

### Nominal and real exchange rate in EU10 countries

Before analysing exchange rate regimes it is useful to clear certain definitions first. By definition the nominal exchange rate is the number of units of the domestic currency that can purchase a unit of a given foreign currency. A decrease in this variable is called nominal appreciation of the currency. Under a fixed exchange rate regime, a downward adjustment of the nominal exchange rate is a revaluation. An increase in this variable is the nominal depreciation of the currency. And under a fixed exchange rate regime, an upward adjustment of the nominal exchange rate is called devaluation.<sup>31</sup>

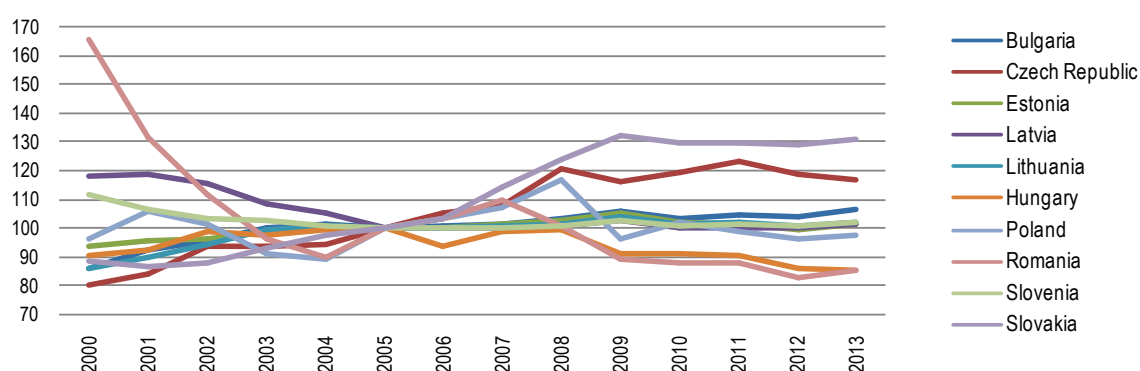
Concerning the nominal exchange rate movements in EU10 countries, we can see a really mixed picture. First, among the euro area members we cannot define similar trends in nominal exchange rates, more or less as a consequence of pursuing different monetary and economic policies regarding entering the euro zone. The essential question here is whether to enter the euro area in an undervalued or overvalued exchange rate. Both of them are associated with advantages and disadvantages. An overvalued exchange rate can be useful to raise the purchasing power of real wages but it may worsen the competitiveness of traded goods and reduce the export and GDP growth, therefore it has substantial negative effects on real convergence process. An undervalued exchange rate obviously eases the purchasing power of real wages, thus inflationary forces come into operation. But joining the euro area in an undervalued exchange rate has a positive effect on the competitiveness of exported goods, which is especially important in a small open economy so the gains from growing trade balance surpluses may raise the output and the process of convergence accelerates.

<sup>31</sup> Source: Czech National Bank, [https://www.cnb.cz/en/faq/what\\_is\\_the\\_nominal\\_and\\_real\\_exchange\\_rate.html](https://www.cnb.cz/en/faq/what_is_the_nominal_and_real_exchange_rate.html)

Looking at the nominal exchange rate developments of EU10 countries, we can identify undervalued and overvalued nominal exchange rates. By the year 2015, all of the Baltic countries will be members of the euro area, but they have had different nominal exchange rate developments since 2000. Estonia has had a constant nominal exchange rate, Latvia had a nominal depreciation in early 2000s and Lithuania had a nominal appreciation till 2003. After the middle of the 2000s, both Latvia and Lithuania have had a flat nominal exchange rate, that did not altered during the global financial crisis. The Baltic countries pursued a more or less optimal monetary policy regarding entering the eurozone, that was a consequence of the strictly pegged exchange rate – currency board. The post-Yugoslavian country, Slovenia joined the eurozone first in 2007, due to its relative high degree of development. In Slovenia we can identify a relative appreciation of the nominal exchange rate lasting until 2004, and after that the nominal exchange rate was almost unchanged. Between 2000 and 2009, there was a steady appreciation of the currency in Slovakia and before joining the euro area the appreciation accelerated because the Slovak Government was interested in entering the eurozone at a highly overvalued nominal exchange rate. Since then, the Slovak nominal exchange rate has been constant, thus the purchasing power of the wages is still highly overvalued comparing the regional competitors. (Slovak residents usually do shopping in neighbouring countries such as in Hungary). The remaining five countries which are not participating in the euro area show us a mixed picture. Hungary and Romania have been applying a firmly undervalued currency in order to maximise benefits from net exports. The depreciation of the nominal exchange rate in Hungary started in 2007 after a moderate appreciation (see Figure 2). In Romania, there was an enormous devaluation of the currency during the early 2000s until 2004, which was succeeded by a mild appreciation due to the introduction of the new currency (new lei) in 2005. In 2007 the nominal exchange rate started again depreciating. Bulgaria and Poland have had a constant nominal exchange rate with small deviations as a consequence of the global financial crises. Finally, in the Czech Republic we can see a continuous appreciation of the currency till 2007, since then the nominal exchange rate is constant but significantly overvalued.

**Figure 2: Nominal exchange rates in EU10 countries**

37 trading partners, 2005 = 100



Source: Eurostat

The real exchange rate is defined as the ratio of the price level abroad and the domestic price level, where the foreign price level is converted into domestic currency units via the current nominal exchange rate. An increase in real exchange rate is called appreciation of the real exchange rate, a decrease is called depreciation. The real

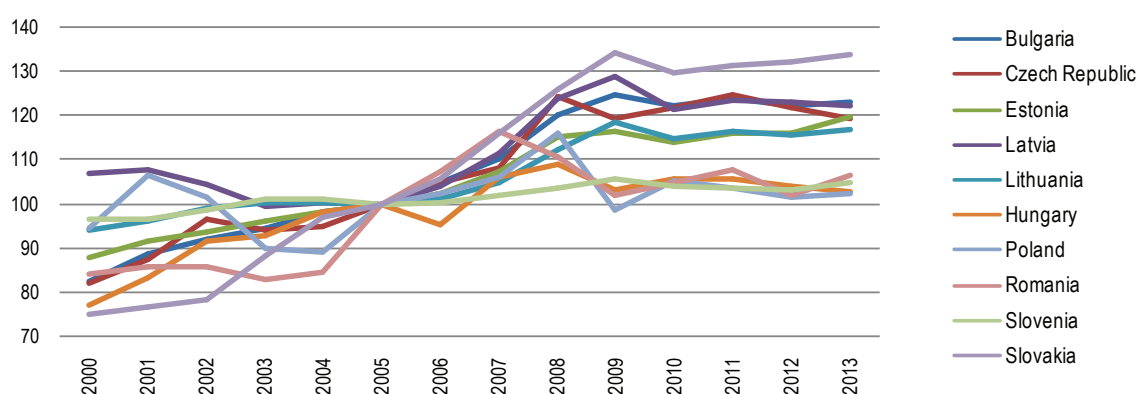
rate tells us how many times more goods and services can be purchased abroad (after conversion into a foreign currency) than in the domestic market for a given amount. In practice, changes of the real exchange rate rather than its absolute level are important. In contrast to the nominal exchange rate, the real exchange rate is always floating, since even in the regime of a fixed nominal exchange rate, real exchange rate can move via price-level changes. Real Effective Exchange Rate (REER) is a measure of the trade-weighted average exchange rate of a currency against a basket of currencies after adjusting for inflation differentials with regard to the countries concerned and expressed as an index number relative to a base year.<sup>32</sup>

Academics usually analyse two different kind of real exchange rate. The first one is the consumer price index based real exchange rate, and the second one is the unit labour cost based real exchange rate. The former is computed as a weighted average of bilateral exchange rates vis-à-vis key trading partners' currencies, adjusted for relative inflation differentials, the latter is adjusted for relative unit labour costs. Both variables can be used as a competitiveness indicator and as an indicator to define real effective exchange rate appreciation or depreciation.

The consumer price indices based real effective exchange rates of EU10 countries show overvaluation in each country but to varying degrees (see Figure 3). Hungary, Poland, Romania and Slovenia have had a slightly overvalued trend in the consumer price indices based real effective exchange rates since the global financial crisis. The remaining EU10 countries except for Slovakia have had a moderate overvaluation that started during the global financial crisis. The consumer price indices based real effective exchange rate in Slovakia went through a long lasted appreciation trend till 2009, when the country joined the euro area, and after that there were no deviations from the constant level.

**Figure 3: Real effective exchange rates of EU10 countries**

deflator: consumer price indices – 37 trading partners, 2005 = 100



Source: Eurostat

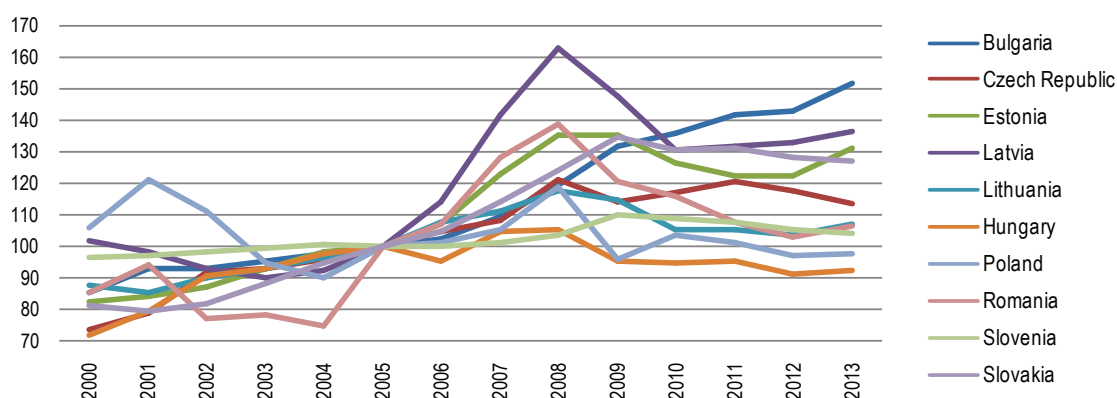
The unit labour costs based real effective exchange rates of EU10 countries depict a robust overvaluation in almost each EU10 countries with the exception of Hungary and Poland. In several countries the convergence

<sup>32</sup> REER is also defined as the average of the bilateral Real Exchange Rates (RER) between the country and each of its trading partners, weighted by the respective trade shares of each partner. Being an average, the REER of a country can be said to be in equilibrium if it is found overvalued in relation to one or more trading partners whilst also being undervalued to the others.

process took place in an economically unhealthy manner, thus unit labour cost (wages) have been increasing in a faster pace than the output (GDP). Therefore the productivity and competitiveness of these countries have deteriorated significantly since they joined the European Union. Hungary and Poland have undervalued currency in terms of unit labour costs based real effective exchange rate that is why both of them are more competitive than the other EU10 countries.

**Figure 4: Real effective exchange rates of EU10 countries**

deflator: unit labour costs in the total economy – 37 trading partners, 2005 = 100



Source: Eurostat

As a consequence of the global financial crisis unit labour costs based real effective exchange rates in Baltic states, Slovenia, Slovakia, and the Czech republic turned to a downward trend (see Figure 4) but this trend was not accompanied by robust internal devaluation which is necessary to restore competitiveness. External devaluation is only possible in countries that apply floating exchange rate regimes, therefore the Baltic states, Slovenia and Slovakia in the euro area and Bulgaria with its currency board cannot achieve higher competitiveness without internal devaluation. The euro is globally overvalued against main currencies but the European Central Bank is reluctant to devalue it safeguarding the peripheral euro zone countries. Bulgaria pegged its domestic currency to the euro thus external devaluation is impossible without abandoning the fixed exchange rate regime.

#### *Inflation and inflation targeting in EU10 countries*

After the collapse of the CMEA, most countries faced high or hyperinflation as prices moved to market levels and as governments used monetary financing for rebalancing fiscal deficits. One of the most important tasks was to break down inflation and during the 1990s these countries were successful in controlling inflation dynamics. By the beginnings of the 2000s EU10 countries reached one-digit inflation rates except for Romania where in 2000 a 45.7% inflation rate was registered and inflationary pressure eased only by mid-2000s. The primordial task was to maintain or decrease the formerly reached inflation levels because they had to meet the convergence criterion regarding the inflation rate too. Therefore several countries introduced an inflation targeting framework to anchor inflationary expectations at a low level. Novak (2011) and De Grauwe and Schnabl (2005) also express that the introduction of the inflation targeting in some EU10 countries proved to be a right choice. Five countries



introduced inflation targeting, the first was the Czech Republic in 1997, defining a low-inflationary path, and since 2002 the Czech Republic has been pursuing a relatively low inflation target of 1-3% band. Poland planned to apply inflation targeting also in the 1990s but between 1998 and 2003 there was no defined target rate thus the explicit inflation targeting became effective in 2004 with 2.5%  $\pm$  1 percentage point. Hungary introduced the regime in 2001, but several times it was impossible to keep inflation within the band. (Although the average annual inflation rate was 1.7% in 2013 and the predicted rate for 2014 appears to be zero, the government of the National Bank of Hungary have been reluctant to lower the target inflation). Explicit inflation targeting came to effect in 2005 in Slovakia, however after introducing the euro Slovakia delegated the conduct of monetary policy to community level. And last but not least Romania introduced the regime in 2005 (see Table1).

**Table1: Inflation targeting regime in five Central and Eastern European countries**

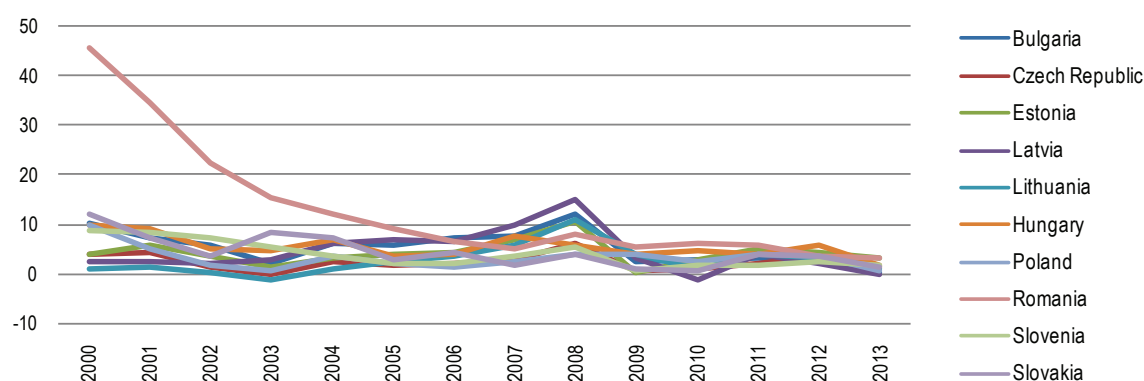
Country	Introduction of the regime	Percentage rate
Czech Republic	1997: introduction of the regime	1998: 5.5-6.5%
		1999: 4-5%
		2000: 3.5-4.5%
		2001: 2-4%
		2002: 1-3%
Hungary	2001: introduction of the regime	2002: 4,5%+/-1
		2003: 3,5% +/-1
		2004: 3,5% +/-1
		2005: 4% +/-1
		2006: 3% +/-1
		2007: 3% +/-1
Poland	1998: introduction of the regime	2004: 2,5% +/- 1%
	1998-2003: reducing the rate of inflation	annual CPI should be as close as
	2003: targeting inflation	possible to 2,5%
Romania	2005: introduction of the regime	2005: 7,5% +/-1
		2006: 5% +/-1
		2007: 4% +/-1
		2008: 3,8% +/-1
		2009: 3,5% +/-1
		2010: 3,5% +/-1
		2011: 3% +/-1
		2013: 2,5% +/-1
Slovakia	1998-2005: implicit inflation targeting	2005: 3,5% +/-0,5
	2005: explicit inflation targeting	2006: 2,5%
	2009: Economic and Monetary Union membership	2007-2008: 2%

Source: Own compilation, based on national bank data (CNB, MNB, NBP, BNR and NBS)

In 2008, the reaction of EU10 countries to the global financial crisis was a sudden increase in inflation rates except in Hungary where the harmonized indices consumer prices decreased to 6% from 7.9%. Inflation rates ranged from 3.9% in Slovakia to 15.3% in Estonia. The volatility of inflation rates and other economic variables such as the GDP growth rate was the highest in the Baltic countries with a sharp decrease and fast rebound. Inflation rates during the global financial crisis were 10.6%, 15.3% and 11.1% respectively in Estonia, Latvia and

Lithuania. The fourth country with a double-digit annual inflation rate was Bulgaria with a peak value of 12%. The (arithmetic) average inflation rate in the EU10 countries was 8.3% in 2008 and only one year later it dropped to a tolerable level of 2.6%. A mild price acceleration was registered in 2011 and 2012 due to the statistical effects of eurocrisis, and then a deflationary period started in corresponding with the overall European Union movements. In Latvia the inflation rate reached zero, and in other seven countries lower than 2% even though the inflation targets of individual countries are higher. In 2013 the (arithmetic) annual average inflation was only 1.5% in the region (see Figure 5).

**Figure 5: Harmonized indices of consumer prices**  
average rate of change, all items



Source: Eurostat

## Financial integration in EU10 countries

In the communist era, financial system did not have an active role; banks financed centrally-planned tasks and projects of state-owned companies. During the transition period to market economy, one of the most important task was to establish a two-tier banking sector in order to allocate capital to productive use. “The creation of central banks, and modern financial systems was an unprecedented challenge, involving building a number of pillars from scratch, to underpin a functioning system. These included prudential regulation, supervision, and an appropriate framework for competition.” (IMF, 2014, pp. 41.) All countries adopted a model based on sound bank supervision, but incomplete reforms led to banking crises in all countries; the sequence of crises started in 1990 in Romania, and finished in 1998 in Slovakia. Thus modern banking systems in EU10 countries were created in the early 2000s after a second phase of reforms.

The banking systems of EU10 countries have been turned into one of the most dynamic sectors of the economies due to continuously rising penetration of foreign bank ownership. From 2004, the foreign banks have been holding majority shares in all EU10 countries (Caporale et al., 2009) and according to the IMF (2014) review on transition in Central and Eastern European countries, banking became the sector with the highest private and foreign participation, and as mentioned, foreign bank ownership was comparatively high.

According to Baele et al. (2004) the definition of integrated financial markets is the following: “The market for a given set of financial instruments and/or services is fully integrated if all potential market participants with the same relevant characteristics:



- (1) face a single set of rules when they decide to deal with those financial instruments and/or services;
- (2) have equal access to the above-mentioned set of financial instruments and/or services; and
- (3) are treated equally when they are active in the market (Baele et al. (2004, pp. 6.).

The concept of financial integration or financial market integration goes back to the 1960s, when as part of the optimum currency area theory, Ingram (1962) pointed to the fact that financial integration can reduce the need for exchange rate adjustments regarding a country or a group of countries planning to adopt a single currency or to irrevocably peg their exchange rates. Through capital flows they can prevent temporary or permanent distortions in the economy. The degree of financial integration is of substantial interest to both academics and policymakers because of its implications on financial markets – money, stock and bond – efficiency, risk-sharing and financial institutions. Financial markets are totally integrated when the law of one price holds (Adam et al., 2002).<sup>33</sup> The consequence of the law of one price is that assets generate the same return, regardless of the location of the issuer and of the asset holder. Financial integration is not only the integration of financial markets and services it can take other forms as well. Liebscher et al. (2006) suggest that integration can take many forms and various aspects:

- monetary integration, either through currency unions or through dollarization as well as euroization;
- liberalization of the capital account;
- subcontracting abroad of financial services or infrastructure, such as in the case of listing of securities on foreign stock exchanges;
- foreign entry, and
- regulatory or institutional convergence and harmonization.

#### *The benefits of financial integration*

Financial integration is usually associated with financial development and countries with properly functioning financial markets (or banking systems) enjoy positive effects on economic growth. Several empirical studies analysed the relationship between financial development and economic growth concluding that effective banking systems accelerate economic growth. Baele et al. (2004) consider three interrelated benefits of financial integration: more opportunities for risk sharing and risk diversification, better allocation of capital among investment opportunities, and finally, financial development. Financial integration provides an access to a larger market and additional opportunities for firms and households to share financial risk and to smooth consumption with purchasing international assets (stocks and bonds), investing in international funds and so on. Regional (and global) risk-sharing opportunities make it possible to finance risky projects with potentially higher returns and financial integration also allows investors to hedge against negative shocks because financial markets and institutions can tackle risk better. Better allocation of capital materializes by removing all forms of impediments to trade financial assets and flow of capital, thus investors want to and will find the most productive investment opportunities.

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<sup>33</sup> The law of one price indicates that "once prices are converted to a common currency, the same good should sell for the same price in different countries" (Rogoff, 1996). Simply put, a good must sell for the same price all locations.

These benefits lead to higher economic growth. Levine (2005) points out that financial institutions and markets can promote economic growth through five different channels:

- 1) easing the exchange of goods and services through the provision of payment services;
- 2) mobilising and pooling savings from a large number of investors;
- 3) acquiring and processing information about enterprises and possible investment projects, thus allocating savings to their most productive use;
- 4) monitoring investment and carrying out corporate governance, and
- 5) diversifying and increasing liquidity and reducing intertemporal risk.

### *Measuring financial integration*

There are no standard measures in the literature for assessing the level of financial integration, various methods exist. Regarding developing countries, Park (1999) stresses that international financial integration may have destabilizing effect on economies with premature financial infrastructure. Park suggests three indicators to measure the degree of international financial integration:

- (1) banks international activities ratio (%) = banks' total foreign assets and liabilities / banks' total assets and liabilities;
- (2) inward foreign direct investment to GDP ratio (%) = annual stock of inward foreign direct investments / GDP;
- (3) private capital flows to GNP ratio (%) = net inward private capital flows / GNP

The first comprehensive study on financial integration was carried out by Adam et al. (2002). They report four categories for indicators of financial integration:

- 1) indicators of credit and bond market integration – for interbank market, bond market, mortgage market and for corporate loan market;
- 2) indicators of stock market integration with alternative indicators of investment fund industry, pension funds and insurance companies;
- 3) indicators of integration based on economic decisions of household and firms, and
- 4) indicators of institutional differences that may induce financial market segmentation.

Regarding these four groups of indicators we can differentiate price-based and quantity-based indicators. From a methodological point of view one can analyse financial market integration in terms of  $\beta$ -convergence and  $\sigma$ -convergence. The former measures the speed of integration of countries to the benchmark value, and the latter measures the deviations from the benchmark value, (if it is possible to address an applicable benchmark value). Lane and Milesi-Ferretti (2003) investigate the growth of foreign asset and liability positions and the rates of return on external assets and liabilities. They apply a volume-based indicator, the stock of aggregate foreign assets and liabilities respectively to the GDP, and an equity based measure, the sum of portfolio assets and

liabilities and FDI assets (and liabilities). Running panel regressions they suggest that external liberalization, trade openness, stock market capitalization and privatization have positive effects on international financial integrations but financial depth in terms of liquid liabilities to GDP, corporate tax rate and insider-trading laws have no significant effects on international financial integration. Returns on external assets and liabilities do not signal common patterns due to unavailability of precise information on cross-border investments.

In the early 2000s, the European Central Bank started to emphasise financial integration due to its growing relevance in the euro zone because financial integration had become a tool of adjustment and risk-sharing mechanism. With the publication of Baele et al. (2004) the European Central Bank started a series of publications in the field of financial integration. They suggest that there are three kinds of measures of financial integrations; price-based measures, news-based measures and quantity-based measure.

### *Financial integration in EU10 countries*

Even though the measurement of financial integration has become increasingly important especially during the global financial crisis that shed light on globally interconnected financial markets, only few studies focused on the transition economies. Baltzer et al. (2008) analyse the financial integration in new European Union member states and they drew five conclusions:

- 1) financial markets in the new European Union member states are less integrated than those in the euro area;
- 2) the process of integration is under way and after the accession to the European Union accelerated;
- 3) money and banking markets are becoming increasingly integrated;
- 4) international financial integration in the bond markets has not yet started;
- 5) equity markets are less integrated.

Caporale et al. (2009) examine the relation between financial development and economic growth of EU10 countries by estimating a dynamic panel model between 1994 and 2007 and they point out that stock and credit markets are still underdeveloped in these countries. Albuлесcu (2011) stresses that financial instability created by the global financial crisis negatively affected the EU10 countries economic and financial integration. Boubarki, Couharde and Guillaumin (2012) assess the degree of financial integration in EU10 countries by testing the Feldstein-Horioka regression. And they conclude that financial integration process of the EU10 countries with euro area is not yet complete. According to the existing measures of financial integration, in this study I carry out analyses on the developments of EU10 financial markets through selective measures namely FDI stock per GDP and the Feldstein-Horioka coefficient<sup>34</sup> to determine the degree of financial integration in EU10 countries.

FDI stock per GDP can be a proxy to assess financial integration (Park, 1999, Edison et al. 2002, and Friedrich, Schnabel and Zettelmeyer, 2010). During the last ten years foreign multinational companies invested billions of euros in EU10 countries. In each country the inward FDI stock per GDP exceeds 30 % except for Slovenia where we can identify a decreasing tendency of inward FDI stock since 2010 due to prolonged economic disturbances (see Table 2.). In 2004, Estonia joined the EU with the highest proportion of inward FDI stock in terms of annual

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<sup>34</sup> Feldstein and Horioka (1980), see definition later.

GDP exceeding 75 %, while Slovenia had the lowest proportion with only 20.1 %. Slovenia, as the most developed former Yugoslavian country, has pursued a completely different kind of economic policy regarding the attraction of foreign capital than some other EU10 economies. In several countries such as in Poland, the Czech Republic or Slovakia, the privatization or brownfield investments was almost the only source of foreign capital in the 1990s, however in Slovenia large number of companies remained in domestic property. In 2004, the average inward FDI stock to GDP was 38.5 % in the region, after ten years we can identify a modest accumulation of foreign capital in EU10 countries, the inward FDI stock per GDP ratio has increased to 57.8 %. In 2004, the top three countries with the highest ratio of inward FDI stock per GDP were Estonia (76%), Hungary (54.3 %) and Slovakia (46.2 %). To the year of 2013 the proportion of foreign investments in Bulgaria has sharply increased to 93.3 %, due to enormous capital inflow in the middle of the 2000s and due to comparatively low GDP level. Estonia (81.2 %) and Hungary (80.2 %) are the following in the rank. From its initial third position, Slovakia lagged behind the top countries with only 58 % of inward FDI stock per GDP.

**Table 2: Inward FDI stock in EU10 countries**  
percent of the GDP

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Bulgaria	26.9	35.5	49.9	66.5	80.8	86.9	94.7	96.1	91.3	91.5	93.3
Czech Republic	40.8	43.8	47.0	49.0	55.3	50.5	58.9	61.5	57.0	64.3	62.7
Estonia	63.8	76.0	84.9	71.3	70.1	71.3	82.5	85.0	79.9	83.2	81.2
Hungary	51.1	54.3	57.4	66.9	64.2	58.3	73.5	69.5	65.9	79.5	80.2
Latvia	25.1	28.3	30.3	33.1	33.0	33.3	42.9	45.4	46.3	46.2	49.7
Lithuania	23.9	25.7	33.0	34.8	35.4	28.1	34.2	35.8	35.3	36.3	35.5
Poland	23.9	30.9	30.7	33.3	37.0	30.4	38.6	42.5	39.0	44.2	45.6
Romania	18.3	24.5	27.3	35.1	34.1	34.3	41.5	41.5	41.4	44.2	42.4
Slovakia	41.9	46.2	50.8	56.2	51.8	55.2	57.2	56.0	57.3	58.6	58.0
Slovenia	19.2	20.1	21.0	21.6	27.8	29.8	29.4	30.2	31.8	32.6	29.7
Average	33.5	38.5	43.2	46.8	49.0	47.8	55.3	56.4	54.5	58.1	57.8

Source: The Vienna Institute for International Economics, database

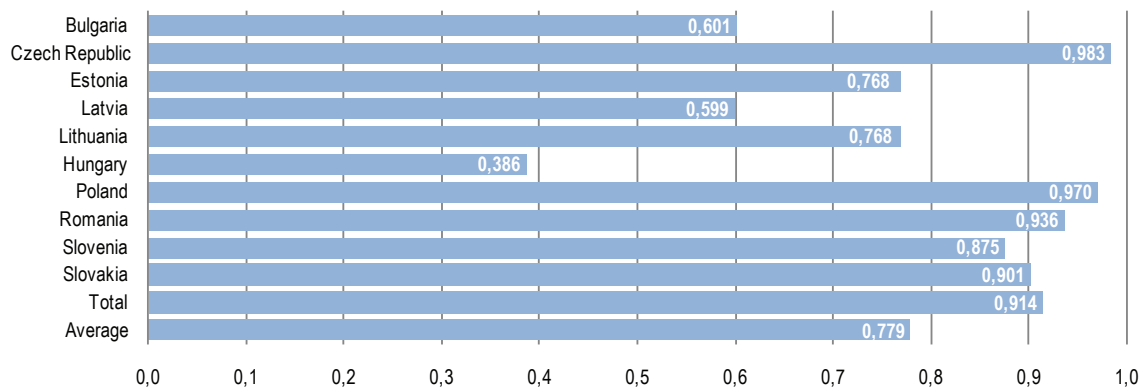
Following Boubarki, Couharde and Guillaumin (2012) a simple method is applied here assessing the degree of financial integration of EU10 countries. To determine Feldstein-Horioka coefficient in Central and Eastern European countries this equation is used:

$$(I/Y) = \alpha + \beta(S/Y),$$

where  $I/Y$  denotes the ratio of investments over GDP and  $S/Y$  represents the ratio of savings over GDP. According to Feldstein and Horioka (1980), financial markets are perfectly integrated into global or regional capital market, if Feldstein-Horioka coefficient is insignificantly different from zero. In this case domestic investments do not depend on domestic savings, since domestic investments can completely be financed by the global or regional pool of capital. To put in other words the lower the correlation between domestic investments and domestic savings the higher the financial integration. I calculated correlation coefficients between gross domestic investments and gross savings for EU10 countries and the results show that average financial

integration into the global capital market is low in Central and Eastern European countries.<sup>35</sup> Data were collected from Eurostat database of national accounts from 2000 to 2003, and gross domestic investments were replaced by gross capital formation due to data availability.<sup>36</sup> According to our calculations financial integration is high in Hungary and relatively high in Bulgaria and Latvia but in other cases is substantially low (see Figure 6.).

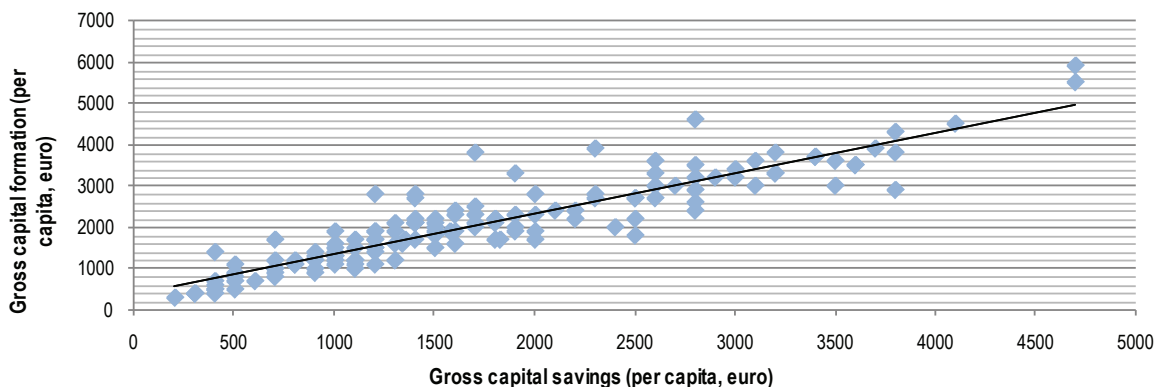
**Figure 6: The Feldstein-Horioka coefficient of given EU10 countries correlations**



Source: Own compilation, based on Eurostat data

The total correlation of EU10 countries represents the relationship between gross domestic investments and gross savings (see Figure 7.). The correlation coefficient,  $R^2=0.8348$  shows strong relationship which means low financial market integration for EU10 countries. The consequence of low financial market integration is to firms and households in EU10 countries do not employ regional and intertemporal risk-sharing.

**Figure 7: The Feldstein-Horioka coefficient of the whole dataset\***



\*  $y = 0.972x + 403.2$ ;  $R^2 = 0.834$

Source: Own compilation, based on Eurostat data

<sup>35</sup> Average correlation is the simple mean of national correlations.

<sup>36</sup> From a methodological point of view there is a little difference between the two measures. Gross capital formation is measured by the total value of gross fixed capital formation changes in inventories and acquisitions less disposals of valuables for unit or sector. Gross domestic investment is the sum of fixed non-residential and residential investments and changes in inventories.

According to our calculations financial integration measured by Feldstein-Horioka coefficients of given EU countries and of the whole dataset illustrates low degree of integration into global financial markets. Even though foreign bank participation in EU10 countries is especially high, there stock and bond markets are less integrated. This can be explained by several factors for instance low financial literacy, lower risk-taking behaviour and saving decisions of households.

## **Concluding remarks**

Between 2004 and 2007, ten Central and Eastern European countries joined the European Union. Since the accession of the EU10 countries, these states have expressed their wish to quickly integrate into the euro area. The enlargement of the eurozone started in 2007 with the accession of Slovenia, and then Slovakia, Estonia and Latvia already belong to the euro area since, respectively, 2009, 2011 and 2014. Lithuania joins the eurozone in 2015. However, by 2008-09 the global financial crisis and 2010-11 the debt crisis in the eurozone caused reluctant interest in joining the euro area regarding the Czech Republic, Hungary and Poland.

In this study, monetary integration analysed by exchange rate regimes, exchange rate policy and inflation convergence that show significant catch-up. By the year of accessing the EU a mixed picture can be seen regarding the exchange rate regimes. The Baltic states and Bulgaria adopted a peg, other countries floating. Smaller countries tend to have fixed exchange rates but the determination of exchange rates does not really explain the success in accessing the euro area even though only smaller countries have achieved this. Exchange rates are usually subject to overall economic goals, the undervalued rate is good for boost gains from export and the overvalued is considered to be fit to enlarge purchasing power of domestic currency. Therefore no common patterns can be found in EU10 countries regarding nominal and real effective exchange rates. Due to the global financial crisis inflation rates are close to zero in all EU10 countries.

The second part of this study deals with financial integration in the region. On the one hand, inward stock FDI was more than one and a half times bigger in 2013 comparing the 2004 level, which represents a substantial inward capital flow. On the other hand, inward capital flow can be explained by increased international fragmentation of production due to outsourcing and offshoring of companies located in old EU members to low-wage new member states which is facilitated the international competitiveness of EU companies. Financial integration in EU10 countries according to a simple method (Feldstein-Horioka coefficient) depicts low degree of integration into global (or regional) financial markets.

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