

# MECHANISMS DRIVING FOREIGN CURRENCY DEBT OF PRIVATE HOUSEHOLDS IN CEECs

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## Abstract

This paper investigates into the mechanisms driving de facto currency substitution of debt emerging market economies with particular focus on Central and Eastern European Countries (CEECs). While de facto currency substitution in terms of dollarisation e.g. in Latin America is a well-researched topic, literature on de facto currency substitution in Central and Eastern Europe is scarce but growing (e.g. Bodnár 2007; Luca and Petrova 2007). In this paper, descriptive evidence of de facto currency substitution and potential drivers in CEECs over 1996 to 2006 provide a more detailed insight into this phenomenon. The literature review on currency substitution reveals that high inflation and exchange rate volatility have driven currency substitution in emerging market economies where the foreign currency serves as a store of value. In CEECs, cost considerations (lower interest rates) spur currency substitution of liabilities held by economic agents with banks. Although inflation and exchange rate volatility have been moderate and the banking sector stable, currency substitution of liabilities is growing. It seems to be a legacy of the past as well as anticipation of potential future integration into the European Monetary Union (EMU). Increasing competition in banking and lower refinancing costs in foreign currency for banks seem to add to the popularity of foreign currency lending at the supply-side. This study can provide valuable information for financial market supervisors as more focused measures could be taken to regulate this particular credit market segment if the drivers of foreign currency lending were known.

*Keywords:* foreign currency credit, supply and demand for money, credit growth, currency substitution, financial economics, emerging markets

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## 1. Introduction

In 2006, more than 50 percent of total loans to private households were denominated in foreign currency (mostly in euro) in the Baltic region and more than 30 percent in Romania and Poland (Sirtaine and Skamnelos 2007). De facto currency substitution is also a debt phenomenon in CEECs. This paper discusses in more detail: What are the reasons for de facto currency substitution in general and in CEECs? What are associated risks?

Published research on de facto currency substitution often applies a framework of money demand in the presence of currency substitution of assets (e.g. Mizen and Pentecost 1994; Komárek and Melecký 2003; De Nicoló, Honohan and Ize 2005), or analyses currency substitution of liabilities (Jeanne 2003; Epstein and Tzanninis 2005; Luca and Petrova 2007). Risk aspects at the bank and state level are the core focus of published research, particularly as the financial crises at the beginning of the 21st century suggest that currency substitution is an important source of financial fragility (e.g. Edwards and Magendzo 2002; Honohan 2007). Few papers present models including both, currency substitution of assets and liabilities (e.g. Ize 2005). For CEECs, first few descriptive studies provide data on currency substitution and call for further research on currency substitution of liabilities in particular (e.g. EBRD 2005; ECB 2006a, b; Bodnár 2007). Luca and Petrova (2007) are the first to explicitly model and empirically test the contributions of bank and firm specific factors to currency substitution of liabilities in CEECs and Central Asian countries.

This paper presents a literature review on de facto currency substitution of assets and liabilities in emerging market economies to better understand differences in the reasons for currency substitution of assets and liabilities. What does “de facto” currency substitution mean? De facto currency substitution indicates that the foreign currency is used in parallel to the national domestic currency. It is the result of market forces in contrast to official currency substitution where the foreign currency is implemented by legislation (Luchtmeier 2005). In CEECs, de facto currency substitution is often referred to as euroisation<sup>1</sup> because the euro has mostly been the currency of substitution since 2001 (Ritzberger-Grünwald and Stix 2007).

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<sup>1</sup> In contrast, dollarisation refers to the dollar or any other currency being the currency of substitution.

*The rest of the paper progresses as follows:* Section 2 puts focus on a) drivers, b) risks at the micro (household, firm, bank level) and state level. Published research on the experience in CEECs and empirical evidence for 11 CEECs<sup>2</sup> over 1996-2006 is presented in section 3, where drivers and associated risks for CEECs are discussed. Section 4 concludes and provides ideas for future research.

## **2. De facto currency substitution in emerging market economies**

“The rule one nation, one currency of the 19<sup>th</sup> and 20<sup>th</sup> century seems to have been dissolved” (Luchtmeier 2005, 82). Not only official reserves and public debt have been denominated in foreign currency, but private economic agents (individuals, non-financial corporations and banks) make use of foreign currency denominated asset, liabilities and cash. Apart from the individual choice of which currency to make use, monetary authorities of nations can prohibit or allow the use of foreign currencies. For example, foreign currency can be allowed in financial contracts to serve as a store of value, or denomination or indexation of loans in foreign currency may be allowed. Such regulation may affect all local residents, or only business. If a country allows a foreign currency to serve as official currency together with the national currency, there may be no or only few restrictions on the use of this currency. Even payments of debt, taxes and fees may be effected in that foreign currency.

Emerging and developing market economies face high levels of de facto currency substitution<sup>3</sup> as experiences in Latin American countries and CEECs have shown. Among developed countries, small open economies may be exposed to high levels of foreign currency denominated assets and liabilities (e.g. Austria before and after the introduction of the euro; see Epstein and Tzanninis 2005). Financial depth may be too shallow in these countries and their monetary policy is often related to neighboring countries with major currencies (e.g. Austria and its link to the German Mark before 1999). Developed economies serving as offshore financial centers have also faced high levels of currency substitution (Honohan 2007). While these countries have so far been characterized by financial stability despite currency substitution<sup>4</sup>, the development in developing and emerging market economies is a worrying phenomenon. The following section aims at identifying and discussing the reasons for de facto currency substitution in emerging market economies.

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<sup>2</sup> New EU Member States and Accession Countries, i.e. Bulgaria (BG), Croatia (HR), Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Poland (PL), Romania (RO), Slovenia (SI), Slovakia (SK). Turkey is excluded due to the particular structure of its financial system that calls for separate analysis.

<sup>3</sup> The question what is a “high” level is discussed in section 2.2.

<sup>4</sup> Nevertheless, currency substitution particularly if lumped among particular segments of economic agents (e.g. households; small and medium enterprises) need to be carefully monitored.

## 2.1. Mechanisms driving currency substitution in emerging market economies

Every economic agent “makes countless decisions on how to allocate his/her scarce money” to satisfy his/her desires (Samuelson and Nordhaus 1998, 80). If the price of a good rises, consumers tend to substitute other goods for the more expensive good to buy their satisfaction at less cost. Two products are said to be *substitutive products* (or services) if an increase in good (service) “A” leads to a higher quantity demand for good (service) “B” (Samuelson and Nordhaus 1998). In the case of currency substitution, two currencies compete<sup>5</sup>. The price refers to the interest costs (and non-interest costs) /yield on liabilities/assets denominated in domestic and foreign currency. In the case of foreign denominated assets and liabilities, exchange rate changes lead to uncertainty about the return on the assets and respective costs for liabilities. Based on preferences, expectations of exchange and interest rate volatility, liquidity and return (or costs in the case of liabilities), economic agents chose their optimal currency portfolio of assets and liabilities. In addition, Chamon and Hausmann (2002) argue that other individuals’ choices may affect choice of currency composition of assets and liabilities. Emerging market economies are often characterized by capital scarcity, unstable monetary policy, and inflation and exchange rate volatility. This raises the uncertainty of economic agents about returns of domestic currency assets and does bias the choice towards foreign, hard currency assets. The same logic applies to costs of credit contracts. What seems individually optimal may be socially suboptimal (and with time get individually suboptimal) as section 2.2. on risks of currency substitution will show.

The theoretical analysis of currency substitution is dominated by two types of theoretical approaches: the money services approach (e.g. Miles 1978 in Saurman (1986)) and the portfolio balance approach which can be found in the bulk of papers (e.g. Saurman 1986; Darrat, Al-Mutawa, Benkato 1996). The money services approach is characterized by a two stages decision process of economic agents. First, they allocate their wealth among financial and real assets. Second, they chose among different types of money. Such model clearly distinguishes between capital mobility and currency substitution (Mizen and Pentecost 1994). The second, portfolio balance approach argues that economic agents respond to risks by

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<sup>5</sup> It needs to be questioned with respect to this narrow definition of substitutive goods, whether the term currency “substitution” as it is used in the literature is appropriate. Long term expectations about the future development of the local economy (e.g. a lack of confidence) are not included. In addition, regulative restrictions on foreign currency holdings, or e.g. limits on long-term lending in domestic currency show that “currency substitution” may not be “substitution” in the narrow sense defined above. If “the exchange rate between the two currencies [were] fixed, risk characteristics [would be] the same and the monies [would become] perfect substitutes” (Calvo and Végh 1993). In this case, competition and perfect substitution among the official currencies can be assumed (Luchtmeier 2005).

adjusting their money portfolios. This model has been preferred by research (e.g. Mihaljek 2006; Epstein and Tzanninis 2005; Luca and Petrova 2007). Mihaljek (2007) criticizes the distinction between currency and asset substitution, which seems artificial because foreign currency is used as a means of payment, unit of account and store of value. Very poor countries (e.g. Cambodia, Laos), or countries with hyperinflation or deep financial crisis only experience currency without asset substitution (i.e. there are (almost) no valuable assets anymore). In addition, both approaches serve to determine demand-side factors driving currency substitution, mostly from a firm's or household's point of view (e.g. Thomas 1985; Saurman 1986; Epstein and Tzanninis 2005). Most recent research has started to build models including demand and supply side factors driving currency substitution (e.g. portfolio decision of the bank to hedge its own risks; see Ize 2005; Luca and Petrova 2007). In the following, mechanisms at the demand and supply side driving currency substitution of assets and liabilities are discussed in more detail.

History has shown that currency substitution of assets has mainly occurred after a longer period of high or very volatile inflation, for instance in European countries which suffered from hyperinflation after the two world wars or in Latin America more recently (Luchtmeier 2005). Calvo and Végh (1993) put it in a *metaphoric sense*: "Like a crippling disease that leaves no part of an organism untouched, high inflation severely hinders the ability of a currency to perform its basic functions [...]". Citizens consequently lose their trust in the stability of the national currency and switch to another currency. If economies are crisis-prone, liquidity and currency substitution of money as a means of payment play a significant role and can reinforce currency substitution of financial assets. In this case the currency's function to serve as a store of is disturbed (Luchtmeier 2005). Citizens look for different, more stable forms of store of value such as real capital (e.g. investment in dwellings<sup>6</sup>), or they switch to a currency which enjoys a reputation for being relatively successful in maintaining its purchasing power parity over time (Calvo and Végh 1992). It is the lack of monetary credibility which affects the currency structure of economic agents' portfolio of assets. De Nicoló, Honohan and Ize (2005) find evidence for 100 countries over 1990-2001 that the macroeconomic policy and institutional structure play a key role in determining the level of currency substitution of deposits. Agénor and Khan (1996) include data on foreign deposits held abroad and find similar results that volatility in inflation and interest rates make

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<sup>6</sup> In turn, this can lead to a strong increase in housing prices.

agents to hold foreign currency deposits abroad which is referred to as capital flight. Their analysis includes ten developing countries over 1982-1990.

But why is currency substitution of assets persisting in many emerging countries despite advances in institutional development and inflation being under control? On the one hand, this phenomenon is a legacy of high inflationary experiences in the past and may show the fear of another currency's weakness or turbulence. On the other hand, even if there are no fears of unstable monetary policy or missing exchange rate discipline, normal volatility of inflation and exchange rates might provide a reason for economic agents to substitute the currency to obtain an "optimal" portfolio composition (Honohan 2007). If economic agents are risk averse and their income is not correlated to the exchange rate, economic agents will choose the currency offering a more stable return. For example, if monetary policy aims at stabilizing exchange rates at the expense of a volatility of interest rates, economic agents choose to save in foreign currency (Chamon and Hauser 2002). Depreciations accompanied by output drops (when caused by external shocks) increase the attractiveness of foreign currencies with safer returns, too (De Nicoló, Honohan, Ize 2005). If the income of economic agents is correlated to the exchange rate, they will want their returns on the savings to compensate for potential losses in their income. If monetary policy is expected to stabilize the exchange rate at the expense of hiking domestic interest rates, economic agents will be better off with (at least some) saving instruments denominated in domestic currency as argued by theory (Chamon and Hauser 2002, 13). Briefly said, financial currency substitution of assets is a home-grown phenomenon with economic agents trying to optimize the currency composition of their financial portfolios (Ize 2005). What about currency substitution of liabilities held by economic agents?

Currency substitution of assets and liabilities is a "simultaneous and interactive" phenomenon. But the majority of published research has analyzed currency substitution of assets (e.g. Darrat, Al-Mutawa, Benkato 1996; De Nicoló, Honohan and Ize 2005; Honohan 2007). Less dominant is the analysis of currency substitution of liabilities (e.g. Jeanne 2003; Ize 2005; Epstein and Tzanninis 2005). In the following, its drivers are discussed.

Currency substitution of liabilities is a persisting phenomenon in emerging and some developed countries such as Austria, where foreign currency credit to households entered a phase of explosive growth in the mid 1990ies (Epstein and Tzanninis 2005). The authors show for Austria that herd behavior as well as supply factors have pushed growth of foreign currency indebtedness of economic agents between 1995 and 2004. The majority of literature on currency substitution of liabilities in emerging and developing countries analyses

currency substitution of sovereign debt (Luchtmeier 2005). Lack of monetary credibility together with scarcity of capital denominated in domestic currency is the classical argument of increasing foreign currency indebtedness (Eichengreen and Hausmann 2003). It is argued that, many emerging and developing countries who are characterized by capital scarcity, unstable monetary policy and underdeveloped, unstable financial markets do not find creditors who grant credit at a reasonable interest rate. The countries' reputation is mostly poor and interest rates incorporating the country and currency risk would not be affordable for these countries. Therefore, they are obliged to issue debt in key international currencies. But, it is not only poor reputation, but also the international capital markets' pressure that makes it necessary even for nations with "ostensibly good reputations or solid fundamentals" to borrow in hard currencies, or at a fixed exchange rate (Bordo and Meissner 2006, 3302).

Lack of monetary credibility does not only promote currency substitution of sovereign debt, but also of liabilities held by private economic agents (households, corporations, banks). For example Jeanne (2003) explores dollarization of liabilities for a sample of about 70 emerging and developed countries over 1990-2000. A de facto equilibrium approach is taken to look at the choice of currency composition of the firms' debt portfolio. The results show that a lack of monetary credibility makes firms to take out foreign currency loans. The unpredictability of monetary policy makes it difficult to determine the future real value of the debt denominated in domestic currency. In emerging and developing countries, the volatility of interest rates tends to be much higher than in developed countries (Chamon and Hausmann 2002). In consequence, uncertainty about costs of domestic credit contracts does bias the choice towards foreign currency indebtedness. But, the real value of debt denominated in foreign currency cannot be forecasted either. "Foreign currency debt is itself dangerous", particularly in the event of a large depreciation (Jeanne 2003, 3). From the point of view of a corporation, switching to a stable international currency as unit of account helps to keep up a functioning price system and helps to avoid exorbitant increases in transaction costs (Luchtmeier 2005, 85). In addition, which seller would want to accept a currency with uncertain value as a medium of exchange? Foreign currencies are then used as substitutes.

Financial markets in early transition (and in developing countries) are incomplete and it is likely that the "domestic currency cannot be used to borrow abroad or to borrow long term, even domestically" (Eichengreen and Hausmann 2003). In particular, small open economies have little room for diversification of large investment due to the missing depth of the domestic financial market (Luchtmeier 2005). Lack of financial depth is identified by Jeanne (2003) to play a crucial role in a corporation's decision to borrow in foreign currency. In order to strengthen financial market development, a credible monetary policy is one of the

preconditions. However, Jeanne (2003, 5) finds persistence of currency substitution despite financial development (measured as the ratio of private sector credit to GDP) for Latin American countries. This phenomenon of persistence of currency substitution has already been highlighted with currency substitution of assets.

With particular regard to lending activities of corporations, the firms' desires for natural hedges and access to alternative financing sources turn out to be important factors determining dollarisation in emerging market economies. They use foreign currency credit to substitute for trade credit and "denominate debt payments and cash flows in the same currency" (Luca and Petrova 2007). Empirical research on foreign currency debt by firms also argues that it is driven by moral hazard created by bailout guarantees (Oliver 2003, Chamon and Hausmann 2002).

While most academic research focuses on demand factors driving currency substitution as described above (e.g. Agénor and Khan 1996; Milner, Mizen and Pentecost 2000; Epstein and Tzanninis 2007), the supply side receives only minor attention from empirical research (e.g. Luca and Petrova 2007). The role of banks in channeling financial intermediation with respect to currency denomination may not be underestimated. For example, banks with large dollarization of deposits need to balance their foreign exchange position by either extending dollar lending to local currency earners or holding dollar assets abroad (De Nicoló, Honohan and Ize 2005, 1713). Luca and Petrova (2007) model supply and demand factors driving dollarization in 21 transition economies of CEE and Central Asia over 1990-2003<sup>7</sup>. The authors claim that they conduct an "in-depth analysis of the use of foreign currencies in the lending activities of banks" which clearly shows their supply-side approach. Luca and Petrova (2007, XXX<sup>8</sup>) state that "our de facto equilibrium model does not explicitly include households' allocation decisions", but look at currency substitution in general. Their empirical evidence is based on a portfolio allocation model and shows that credit dollarization in transition economies has been driven by domestic deposit dollarization. Banks have the desire to match their currency portfolios, even beyond regulatory requirements. The currency risk is shifted onto borrowers by lending in foreign currency. The direct exposure to currency risk vanishes/decreases at the expense of increasing currency-induced default risk.

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<sup>7</sup> Their empirical estimations apply data from 1996 to 2003.

<sup>8</sup> Not yet published, pages not numbered yet.



Altogether, economic agents search to maximize their return on assets, minimize costs of liabilities and try to avoid risks of devaluation (revaluation) of their assets (liabilities). In emerging and developing market economies with high inflation and (expectations of) exchange rate depreciation, currency substitution of assets for hard currencies is particularly popular. On the liability side, currency substitution of government debt is a well-known fact driven by capital scarcity and poor ratings of these countries. But also private economic agents (corporations and households) borrow in foreign currency. Firms involved in international trade and billing in foreign currency strive to hedge. Households may simply follow others and aim to profit from cheaper refinancing in foreign currency. The role of banks as suppliers of financial services in promoting currency substitution may not be overlooked and needs to be analyzed in more detail (Luca and Petrova 2007).

All in all, the identified drivers of currency substitution are similar with assets, cash and liabilities. Ize (2005) argues that currency substitution is a “home-grown” phenomenon. This seems right in view of the identified drivers of currency substitution, but I argue that there are other forces that further push currency substitution, e.g. the constraint of international capital markets to denominate in foreign currencies (e.g. US dollar or euro). The increasing role of foreign owned banks in emerging market economies which mostly originate in hard currency countries needs to be considered as well. If one argued that these factors are mere effects of monetary policy mis-management, I would stress that they aggravate currency substitution even in countries with stabilized inflation and advanced financial development, such as Austria or CEE. All in all, the use of two currencies causes switching costs. The more a currency is used (the greater its dissemination), the greater is the benefit from its use and the more difficult it becomes to reverse this development (Luchtmeier 2005). If benefits are increasing, why should there be a need to reverse de-facto currency substitution? The following section discusses related risks.

## **2.2. Risks of currency substitution at the household, bank and country level**

Hard currency substitution allows agents in an economy characterized by high inflation to retain greater monetary depth than otherwise possible (De Nicoló, Honohan and Ize 2005). In addition to gains from currency substitution in times of increasing inflation (hyperinflation), exchange rate movements determine the gain or loss from currency substitution. If the domestic currency appreciates, currency substitution of liabilities can result in gains via decreasing costs of liabilities. For example in Austria, a well developed country though, the *Gewinn* (Fembek 2006), a weekly magazine, reported “Fremdwährungskredite: Gut gefahren [..]” (gains from currency substitution). But, the attractiveness of foreign currency loans in Austria has been decreasing due to a decreasing interest rate span between the euro and

the Swiss Franc (CHF) and increasing volatility at the derivative markets (OeNB Pressedienst 2007). But, neither the real value of the domestic, nor of the foreign currency can be forecasted. Hence it follows that “foreign currency debt is itself dangerous”, not only for the individual (Jeanne 2003, 3; Boss 2003). After domestic currency substitution of liabilities has reached a certain level, it highly increases the fragility of the whole financial system and can finally result in a financial crisis. High levels of currency substitution might even further push the risk of depreciation. Honohan (2007) finds evidence for 15 emerging and developing countries over 1990-2004. Again, what seems individually optimal may be socially suboptimal (and with time get individually suboptimal).

Theories explaining financial crises<sup>9</sup> have been changing over time. The “first generation literature” discussed currency crises as a consequence of macroeconomic problems and inconsistencies. The “second generation” of models viewed crises as arising uniquely from unexpected changes in market expectations and poor supervision (Mrak 2007). Current work (“third generation models”) explains financial crises in a more complex way and suggests that banking, currency and debt (fiscal) crises are inter-related phenomena. For example, a “large depreciation, a disruption in the banking sector and sovereign debt default” can lead to financial meltdown (Bordo and Meissner 2006, 3301). These third generation models also highlight the “moral hazard” problem of increasing risky lending. In the following, a potential crisis scenario is qualitatively discussed with the aim to highlight risks of currency substitution. It is drawn upon theoretical considerations and empirical findings in published research on currency substitution and inspired by the open economy approach taken in Bordo and Meissner (2006) who particularly focus on the original sin problem which refers to the inability of a country to borrow internationally in their own currency (Eichengreen and Hausmann 1999, 11). I focus on the impact of currency substitution at the household, bank and state level and highlight respective risks.

### **2.2.1. Risks at the level of households**

It is assumed that economic agents (e.g. households) hold a portfolio of foreign and domestic currency assets and liabilities (due to the drivers discussed in section 2.1.). Changes in inflation and exchange rates may adversely affect the portfolio of assets and liabilities. If the domestic currency depreciates, costs of liabilities will increase (Darrat, Al-Mutawa and Benkato 1996).

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<sup>9</sup> There is no universally accepted definition of the term (Mrak 2007).

In the case of foreign currency debt, the following risks need to be beard by economic agents: The exchange rate risk affects repayment at maturity and interest payments. Increasing international interest rates worsen the balance sheet of economic agents and banks alike (Bordo and Meissner 2006). The same applies to the risk of increasing relative interest rates of foreign currency to domestic denominated loans because most (foreign currency) loans are adjusted to money market interest rates at regular intervals. Even if interest rates in the foreign currency are lower compared to those in domestic currency, additional costs can reverse potential gains from lower interest rates (Boss 2003). If repayment vehicles are used for repayment of the foreign currency credit, the risk of the development of the repayment vehicle remains. If foreign currency loans are due at maturity, this risk needs to be particularly considered<sup>10</sup>. In the “ideal situation” of currency and risk diversification, risks are hedged, if the currencies (and maturities) of assets and liabilities are included in the portfolio match. Households receiving remittances in foreign currency, tourism income or holding foreign currency deposits might be hedged<sup>11</sup>. Mostly this is not the case, particularly not for households and small and medium enterprises in emerging market economies. Increasing costs of repayment of liabilities may lead to default of debtors.

If individuals' choices are not independent of each other and affect each others' choice of the currency composition of their portfolio, such herd behavior may contribute to a further increase in currency substitution (Chamon and Hausmann 2002). Epstein and Tzanninis (2005) provide evidence of herd behavior for a developed country (Austria). I argue that herd behavior and accumulation of foreign currency liabilities (and assets) can be an important factor at any level of development of a country.

Altogether, risk of default due to unexpected and adverse exchange and interest rate developments are the major risk involved in currency substitution. Initial trouble in the banking sector might begin if a large share in total credit or a certain group of creditors (e.g. households, small and medium entrepreneurs with mostly domestic sales) is exposed to foreign exchange risk. This leads to spillovers of financial difficulties not only to the banking sector, but also to consumption.

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<sup>10</sup> For example in Austria, 84 percent of foreign currency loans to private households were due at maturity in 2007 and 72 percent of these loans are “secured” via a repayment vehicle (OeNB Pressedienst 2007).

<sup>11</sup> Revenues from the black market, where goods are often traded in international hard currencies would add to foreign currency income but shall only be mentioned in this context.

### **2.2.2. Risks at the bank level**

Banks facing high levels of currency substitution are exposed to solvency and liquidity risks. In the event of a currency crisis, there can be a run on banks. Clients might fear that banks will soon not be able to provide (foreign currency) liquidity and thus withdraw their domestic and foreign currency assets from the bank (De Nicoló, Honohan and Ize 2005). A liquidity crisis that “spirals out of control” may also occur if the function of the central bank to serve as a lender of last resort is limited due to the narrower local currency monetary base (Honohan 2007). The main cause for solvency risk is currency mismatching in case of large depreciations (De Nicoló, Honohan and Ize 2005). The banks’ balance sheets can be affected directly or indirectly via solvency risk. Banks with large domestic dollar liabilities need to balance their open positions either by holding foreign currency assets abroad, or extending foreign currency lending to local currency clients. In the latter case, risks are not absorbed, but transferred to their often unhedged customers. Counterparty risk emerges. Risks can occur individually or become a major concern if they cumulate, which is particularly the case for risks associated with changes in the interest rates, loss of value of the collateral (or repayment vehicle) and the risk of inflation. In case of foreign currency credit, additional risks such as political risks, exchange rate risks and transfer risks add to it (Eilenberger 1996, 208).

Finally, banks remain exposed to the indirect risk of default of debtors in case of large depreciations, although banks usually have tight regulatory limits on their direct open foreign exchange positions<sup>12</sup>. In emerging market economies, poorly designed prudential regulation might not capture banks’ substitution of currency risk with currency-induced default risk and underdeveloped forward markets can prevent banks from completely diversifying risks (Luca and Petrova 2007). This is important as even firms in emerging markets are not adequately hedged against currency risks (Luca and Petrova 2007). Jeanne (2003) highlights the paradox that “an increase in the devaluation risk may lead domestic borrowers to take less insurance against this risk” (e.g. due to higher costs of insurance).

Default of a single debtor should not cause systemic crises (except for sovereign debt). It is rather the level of currency substitution and mass default that causes trouble if exchange rates are very volatile. How to define a high level of currency substitution? Honohan (2007, 6) who analyses dual-currency banking defines it as “any banking system with more than half

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<sup>12</sup> In Mexico, for example, the banks’ open positions in derivatives had been misreported which shows that regulatory limits may not always be effective (De Nicoló, Honohan and Ize 2005).

of its deposits denominated in foreign currency [...] can be described as highly dollarized” which may be risky. I argue that not only high levels within a bank, but also growth rates of the exposure to currency risk of the debtors belonging to particular credit market sectors (e.g. households, or small and medium enterprises) can lead to financial instability and a wave of debt default with direct risk exposure on banks. In addition to the default of debtors, banks face further output losses as they curb their lending activities in times of high inflation and depreciation. Financing gaps may occur and increase the trouble in the local financial sector which might finally result in capital flight (Bordo and Meissner 2006).

Finally, it may also be the nature of debt contracts and the robustness of the financial system that determines the ultimate outcome. Regulation and supervision is required to take action in advance of a crises. De Nicoló, Honohan and Ize (2005, 1698) point out that “only products whose quality is reliable will sell”. Nevertheless, banking crises arise.

### **2.2.3. Risks at the state level**

In emerging market economies, the majority of sovereign debt is denominated in foreign hard currency. Depreciation could lead to an increase in the real value of debt. If tax revenue of the government is denominated in local currency, because prices and wages are set in local currency, financial currency substitution of sovereign debt is risky (De Nicoló, Honohan and Ize 2005). If the “domestic banking system holds large claims against the government, public sector insolvency can immediately lead to banking insolvency” (De Nicoló, Honohan and Ize 2005, 1713)<sup>13</sup>. In addition, not only the domestic financial system is at danger. High levels of currency substitution of government debt also increase the vulnerability of emerging and developing countries to international financial crisis. In emerging open market economies, the debt structure (high levels of original sin) together with balance sheet mismatches and poor reputation explains differences in the crisis incidence (Bordo and Meissner 2006). Currency and banking crises are positively correlated to debt default as shown by a simple scatter plot for more than 40 developed and developing countries over 1972-1997 presented by Bordo and Meissner (2006, 3308).

A growing volume of foreign currency credit of the private sector contributes to the build-up of total external debt of CEECs affecting macroeconomic stability. Such high volumes of currency substitution at the country level limit the efficiency of monetary policy instruments,

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<sup>13</sup> Depreciation has diverse effects on the local economy (e.g. in terms of output losses), which shall not be discussed in detail.

e.g. because interest rate policy can only influence the credit and deposit development denominated in local currency (for further details see Backé, Ritzberger-Grünwald, Stix 2007; Backé and Mooslechner 2004). The picture of financial crisis is “now complete”. A large depreciation together with a disturbance of the banking sector and sovereign debt default has occurred.

Altogether, foreign currency debt is dangerous when it is “mis-managed”. In particular, currency mismatches become a major problem if foreign currency liabilities are not adequately backed by foreign currency assets. Private sector currency substitution adds to the risk of a financial crisis as the experience of the latest crisis in Southeast Asia has shown where private, not sovereign debt was mainly involved (Oliver 2003).

### **3. Currency substitution in Central and Eastern European countries**

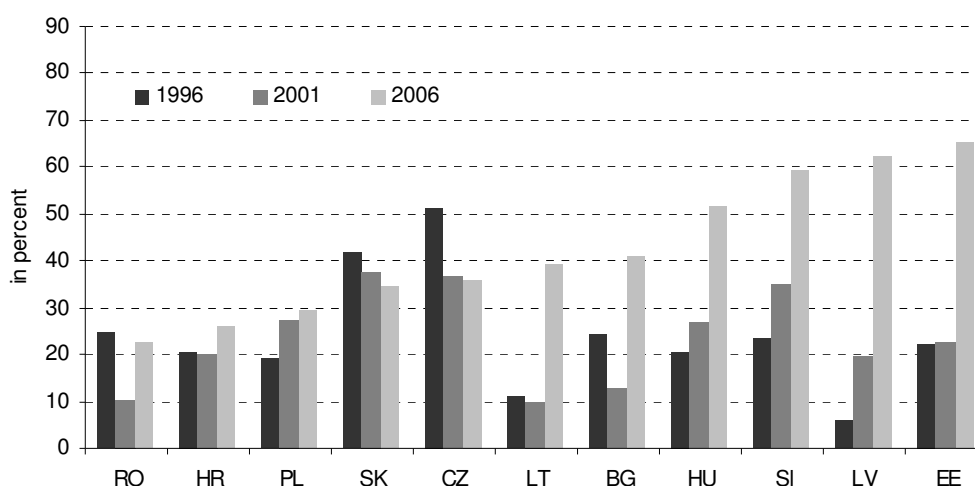
Capital was scarce. Banks were inefficient and burdened with large amounts of non-performing loans in former socialist Central and Eastern European countries (CEECs) before 1990 (Fink, Haiss, Orlowski & Salvatore 1998). Since the beginning of the 90ies of the last century, financial market liberalization has led to a strong inflow of foreign capital and to a majority of foreign ownership in banking in most CEECs. Despite financial market deepening, ongoing banking sector reform and increasing monetary policy stability, currency substitution of assets (deposits and cash) and liabilities persists. In particular, credit market developments and the currency structure of credit need to be monitored as “not every expansion of intermediary activity will be beneficial” (Wachtel 2003, 44; ECB 2006b). Figure 1<sup>14</sup> gives a first overview of private credit<sup>15</sup> developments in eleven CEECs over 1996 to 2006. In 1996, private credit to nominal gross domestic product (GDP) accounted for less than 20 percent in nine out of eleven countries with the exception of Slovakia (42 percent) and the Czech Republic (51 percent). The drop in the level of private credit to GDP until 2001 in the Czech Republic, Bulgaria, Romania and to a lesser extent in Slovakia and Lithuania can be partly attributed to the high level of non-performing loans. Banking crises such as in the Czech Republic at the end of the 1990ies need to be taken into account, too.

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<sup>14</sup> Tables of the data displayed in the subsequent figures referred to in the text (section 3.1., 3.2. and exchange and inflation rates) can be found in the Appendix.

<sup>15</sup> Private credit refers to credit to the private sector including households and non-financial private enterprises.

**Figure1: Total private credit in percent of GDP nom. in 11 CEECs, 1996, 2001, 2006, in percent<sup>16</sup>**



Source: OeNB (2007) and IMF (2008), own compilation

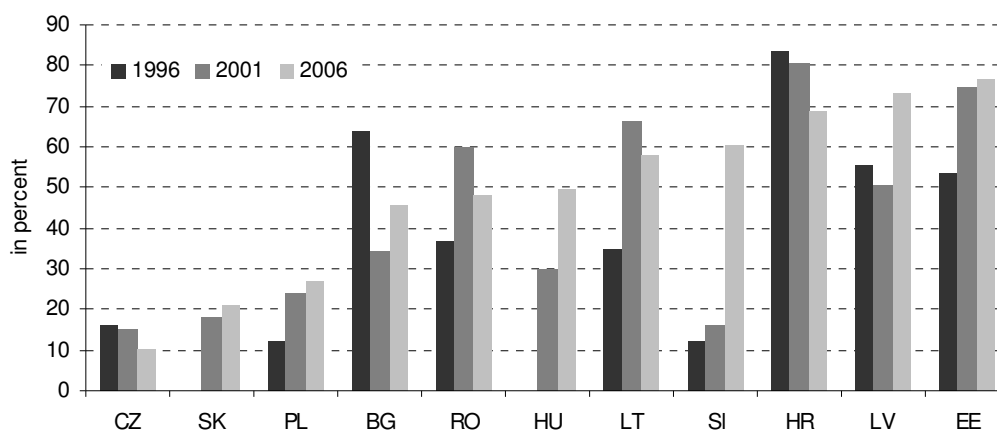
In 2004, the year of accession to the European Union for eight CEECs, annual private credit growth reached 28 percent for the whole sample and was 10 percentage points higher in 2006. Increasing private sector lending, the spread of (new) financial products, such as mortgage loans, created the conditions for rapid credit expansion to the private sector. Despite a decline in annual private credit growth from 2004 to 2006 in Hungary and Bulgaria, the level of private credit to GDP increased. The following sections provide a more detailed insight into currency substitution of private sector credit and its drivers in CEECs.

### 3.1. Empirical evidence for de facto currency substitution of private credit

The currency structure of private credit in CEECs varies across countries and has been changing over time. While the share of foreign currency credit in total private credit remained at low levels in some countries, ranging from 10 percent in the Czech Republic, 21 percent in Slovakia to 27 percent in Poland in 2006, all remaining countries reported a share of more than 40 percent in 2006 (see figure 2). Loans indexed in foreign currency are included in these figures if they had been reported by the national banking statistics (OeNB 2007). For example in Croatia, 66.6 percent of total private credit was indexed in foreign currency at the end of 2005 (ECB 2006a).

<sup>16</sup> Total private credit refers to credit denominated in local and foreign currency. Abbreviations used: BG (Bulgaria), CZ (Czech Republic), EE (Estonia), HR (Croatia), HU (Hungary), LT (Lithuania), LV (Latvia), PL (Poland), RO (Romania), SK (Slovakia), SI (Slovenia). Missing data: HR and EE for 1996, replaced by data from 1999 for HR and 1997 for EE.

**Figure 2: Share of foreign currency credit in total private credit, in 11 CEECs, 1996, 2001, 2006, in percent<sup>17</sup>**



Source: OeNB (2007), own compilation

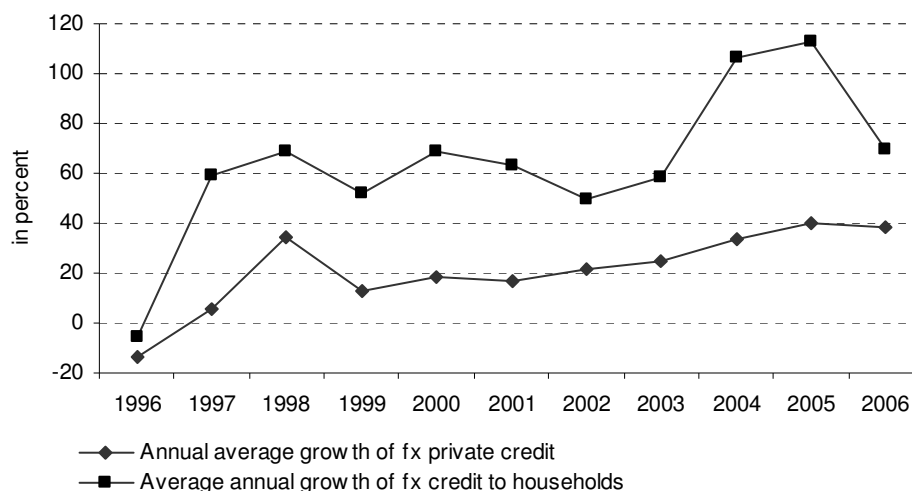
The Baltic countries, Romania and Croatia faced particularly high shares of foreign currency credit in total private credit at the beginning of the 21<sup>st</sup> century. Annual growth of private credit in foreign currency further increased in these countries. In 2005, annual average growth of private credit in foreign currency reached its highest level of 40.35 percent before declining to 38 percent in 2006 (see figure 3). Romania reported increasing annual growth in private credit in foreign currency in 2006, but the share of foreign currency credit in total private credit declined from 58 percent in 2005 to 48 percent in 2006 due to a stronger increase in domestic currency private credit in the last year of observation. In addition, the Romanian National bank introduced specific measures to curb foreign currency indebtedness which might have contributed to higher growth in domestic currency private credit.

In some countries, private credit in foreign currency accounted for a high share in nominal GDP in 2006, for example in Estonia (50 percent), Latvia (46 percent), Slovenia (36 percent), Hungary (26 percent) and Lithuania (23 percent). The high share of foreign currency credit in Slovenia in 2006 could be attributed to the anticipation of accession to the European monetary union in 2007 as the majority of credit was denominated in euros. As evidence for the Baltic countries shows, currency substitution of credit has also been more widespread in countries with fixed exchange rate regimes or exchange rate targets.

<sup>17</sup> Missing data: No data available for 1996 for CZ, EE, HR, HU and SK, replaced by data from 1997 for CZ and EE, 1999 for HR. No data available for SK for 1996 to 2002, replaced by data from 2003.



**Figure 3: Annual growth rate of private credit in foreign currency and foreign currency credit to households, 11 CEECs, 1996 to 2006, in percent<sup>18</sup>**



Source: OeNB (2007), own compilation

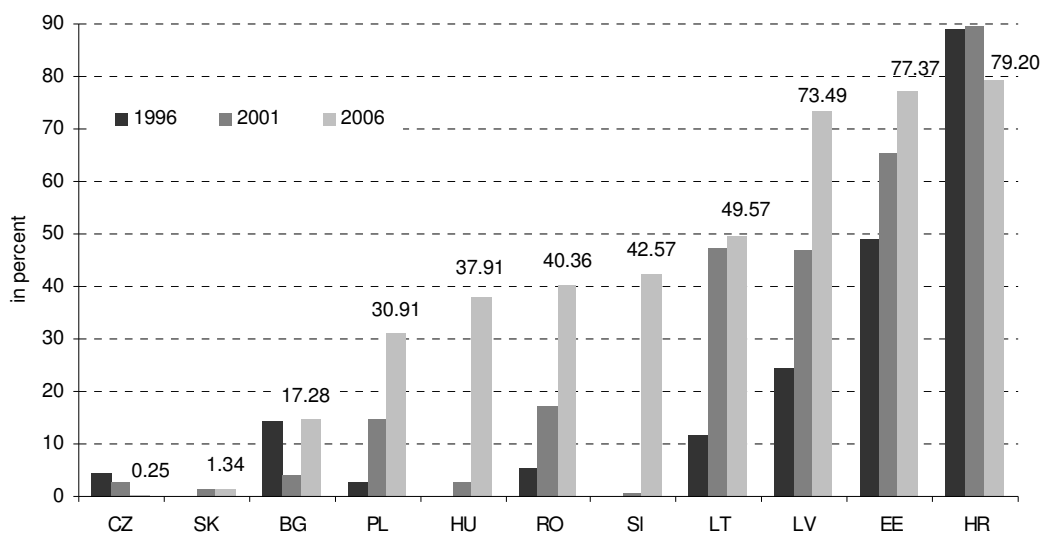
Within private credit in foreign currency, credit to households in foreign currency is of particular interest due to the associated risks of these loans discussed in section 2.2. In terms of its share to nominal GDP, only Estonian, Latvian and Slovenian households hold significant shares in 2006 (25 percent (EUR mn 3,232) in Estland, 23 percent (EUR mn 3,522) in Latvia and 17 percent (EUR mn 2,074) in Slovenia). The development of annual growth of households' credit in foreign currency varied among the 11 CEECs over 1996 to 2006. The peak of 113 percent in the annual average growth rate of households' credit in foreign currency in 2005 was particularly driven by strong annual growth in Hungary (242 percent), Slovakia (211 percent), Lithuania (150 percent), Romania (146 percent) and Bulgaria (140 percent). In 2006, the decline in average annual growth of households' credit in foreign currency, though still at a high level of 70 percent, could have been caused by implemented regulations to curb credit growth in foreign currency (see figure 3). Nevertheless, Condon (2006) for instance reports for Hungary that 90 percent of new issues accounted for foreign currency loans in 2006.

The average share of foreign currency credit to total credit to households was increasing from 10 percent in 1996 to 41 percent in 2006. Temporary declines could be observed in some countries, for example in Lithuania from 47 percent in 2001 to 26 percent in 2003, but

<sup>18</sup> The annual growth rates for 1999 (1473%) and 2005 (980%) for Slovenia are excluded from the calculation of the average annual growth rate because they represent outliers.

only the Czech Republic experienced a decline over the whole period (from 4.5 percent in 1996 to 0.25 percent in 2006). Figure 4 shows the development in the eleven CEECs.

**Figure 4: Share of foreign currency credit to households in total credit to households, 11 CEECs, 1996, 2001, 2006, in percent<sup>19</sup>**



Source: OeNB (2007), own compilation

Altogether, the highest level of financial intermediation in terms of private credit to nominal GDP together with a high share of currency substitution of private credit and credit to households could be observed in Estland and Latvia in 2006. In contrast, Croatia experienced high popularity of currency substitution of private credit and credit to households, while private credit to GDP remained at a low level in 2006. The same applies to Romania and Lithuania, though at lower levels of currency substitution as shown by the changing order of the countries displayed in the figures above. The development of the annual growth rates of foreign currency credit to households has been at a higher level than annual growth of private credit in foreign currency. In particular, the increase of currency substitution of credit by households calls for an in-depth analysis.

<sup>19</sup> Missing data: No data available for 1996 for CZ, EE, HR and SK, replaced by data from 1997 for CZ and EE and by data from 1999 for HR (no available data for 1996 to 1998). No data available for SK for 1996 to 2001 to 2002, replaced by data from 2003.

### 3.2. Empirical evidence for de facto currency substitution of cash and private deposits in CEECs

If a household holds foreign currency cash or deposits, it could encourage to also take a credit denominated in foreign currency. Therefore, the following section shows developments of foreign currency cash and deposits in CEECs. Very little is known about foreign currency holdings in cash (Ritzberger-Grünwald and Stix 2007). In Austrian neighboring CEECs, the Austrian National bank conducts a survey among households on a regular basis since 1996. The results show that a significant amount of foreign currency cash has been held in the Czech Republic, Slovenia, Croatia and Slovakia over 1996 to 2006 (Ritzberger-Grünwald and Stix 2007). The values shown in table 1 correspond to the percentage of respondents to the survey who held foreign cash. While these average time series fluctuate, the percentage of households holding Euro cash increased on average from 20.4 percent in 2002 to 27.5 percent in 2005, but interestingly decreased in 2006.

**Table 1: Foreign cash holdings, average percentage of respondents holding foreign cash (qualitative survey OeNB 1996ff)<sup>20</sup>**

|      | CZ    | HU    | SK    | SI    | HR    |
|------|-------|-------|-------|-------|-------|
| 1996 | na    | na    | na    | na    | na    |
| 1997 | 84.50 | 21.50 | 55.00 | 57.50 | 53.00 |
| 1998 | 86.00 | 15.00 | 49.50 | 74.00 | 35.00 |
| 1999 | 92.00 | 12.50 | 57.50 | 61.00 | 24.50 |
| 2000 | 91.00 | 12.00 | 63.50 | 71.00 | 32.50 |
| 2001 | 46.50 | 11.50 | 45.50 | 74.00 | 28.00 |
| 2002 | 31.00 | 6.50  | 26.50 | 49.00 | 20.50 |
| 2003 | 33.50 | 5.00  | 35.00 | 46.50 | 23.00 |
| 2004 | 39.30 | 9.15  | 39.15 | 53.50 | 20.65 |
| 2005 | 37.00 | 10.50 | 36.00 | 56.00 | 32.50 |
| 2006 | 37.50 | 7.00  | 37.50 | 49.50 | 30.00 |

Source: OeNB (2007), own compilation

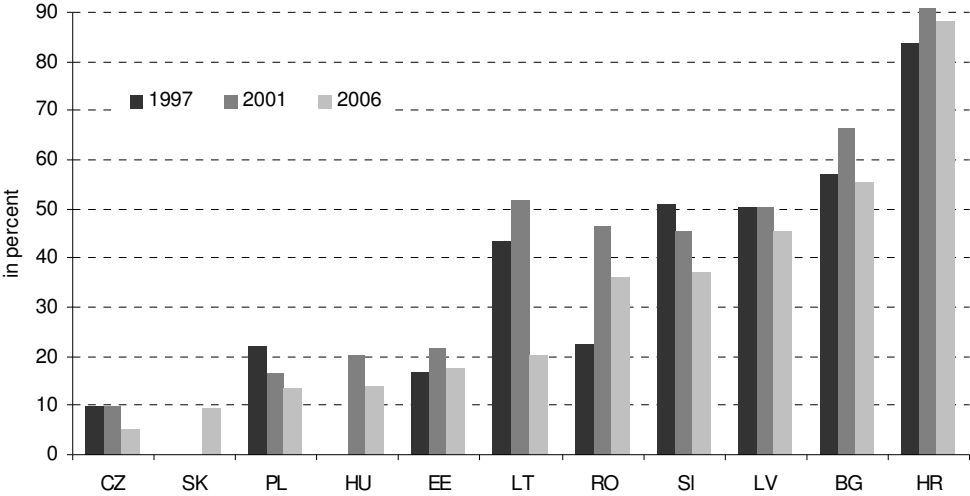
The percentage of respondents holding USD cash has decreased on average from 8.9 percent in 1997 to 4.8 percent of respondents in 2006. The sharp decline in 2002 in table 1 was caused by the introduction of Euro banknotes and coins in January 2002. According to the survey, 21 percent of the respondents exchanged their German mark holdings for local currencies, about 71 percent for euro, 4 percent for U.S. dollar, 1 percent for Swiss franc and 2 percent for other currencies<sup>21</sup> (OeNB 2007).

<sup>20</sup> The survey has been conducted in the Austrian neighbouring CEECs twice a year. The number of households has been approximately 1,000 per country within the population aged 15+ (Ritzberger-Grünwald and Stix 2007). Original data displays the percentage of respondents holding foreign cash according to currency (DEM, ATS and USD until 2001, since 2002 EUR and USD).

<sup>21</sup> The paper does not explain the action taken by the remaining 1 percent of respondents.

Currency substitution of deposits has been widespread in some CEECs since the beginning of the 90ies. While the households' foreign currency share in total deposits has decreased in most countries since the beginning of the 21<sup>st</sup> century, Lithuania experienced a drop from a peak of 55 percent in 2000 to 20 percent in 2006 (see figure 5). The highest share of foreign currency deposits over the entire period of 1997 to 2006 has been held in Croatia and reached 88 percent in 2006.

**Figure 5: Share of foreign currency in total deposits held by households, 11 CEECs, 1997<sup>22</sup>, 2001, 2006, in percent**

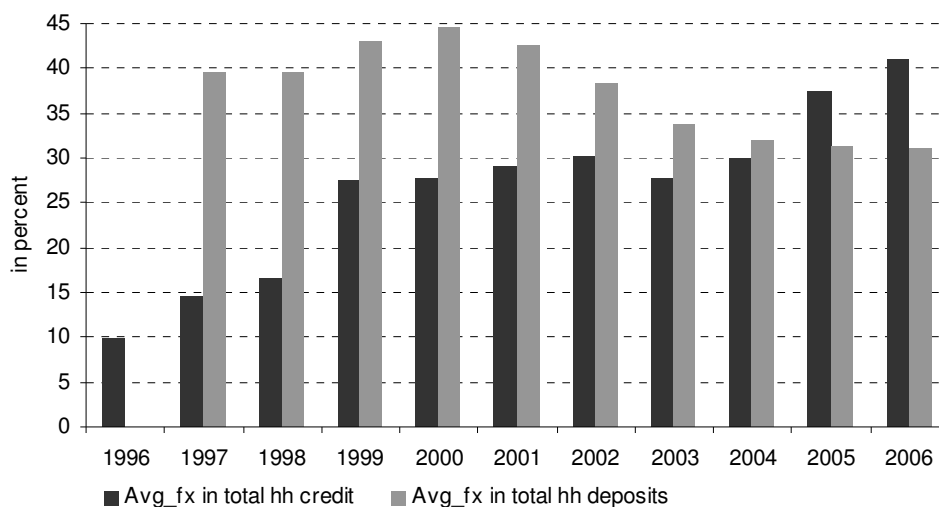


Source: OeNB (2007), own compilation

On average, the popularity of foreign currency substitution of deposits with households increased until 2000. During that year, the share in total deposits to households reached a peak of 45 percent (see figure 6). Since 2000, its popularity has decreased to reach 31 percent in 2006. In contrast, the average share of foreign currency credit held by households increased from the mid 90ies (10 percent in 1996) to 2006 (41 percent) despite a slight decline in 2003.

<sup>22</sup> No data available for 1996.

**Figure 6: Comparison of the average share of foreign currency credit (deposits) in total credit (deposits) to households, average of 11 CEECs, 1996 to 2006, in percent**



Source: OeNB (2007), own compilation

Country data on the share of credit to deposit currency substitution by households shows that in Croatia and the Czech Republic, households held much more deposits in foreign currency than credit (see the appendix). In all other countries, the share of foreign currency credit to foreign currency deposits increased since 2000 the latest. Estonia is the only country that experienced a higher share of foreign currency credit in foreign currency deposits over the 1996 to 2006. In Hungary, Poland and Lithuania the volume of foreign currency credit surpassed foreign currency deposits in 2005, in Latvia in 2004.

Altogether, the popularity of currency substitution of deposits among households has been decreasing since 2000, whereas currency substitution of credit is on the rise. More in-depth analysis is needed to answer whether there is a direct causal relationship between the developments of foreign currency credit, deposits and cash.

### 3.3. Mechanisms driving currency substitution in CEECs

Empirical research on currency substitution in emerging market economies shows that periods of hyperinflation and exchange rate volatility, a lack of financial depth and monetary credibility spurred currency substitution of assets and liabilities by households (see section 2). Does this also apply to the transition economies of CEE?

Empirical evidence of the mechanisms driving currency substitution in CEECs is scarce but expanding - particularly on currency substitution of firms (e.g. Papademos 2005; Honohan 2007; Luca and Petrova 2007). According to Papademos (2005), the majority of foreign currency loans to corporations are held by larger multinational firms, which generate the

greater part of their revenues in foreign currency. These foreign currency revenues can be considered as a hedging instrument (Papademos 2005). Luca and Petrova (2007) show that firms' hedging is important but it turned out not to be so robust in their estimations including CEECs and Central Asian countries over 1996 to 2003. Honohan (2007) argues that globalization of trade and international financial links drive currency substitution with firms. Increasing currency substitution of SMEs which are not involved in international trade is a concern because they are mostly not hedged against adverse exchange rate developments (e.g. Bodnár 2007). Potential drivers of currency substitution by households are presented in the following.

**Table 2: Main reasons for the popularity of foreign currency credit identified in qualitative surveys**

| <b>Reasons</b>                              | <b>HU</b> | <b>PL</b> | <b>SK</b> | <b>SI</b> | <b>EE</b> | <b>LV</b> | <b>LT</b> | <b>BG</b> | <b>RO</b> | <b>AT</b> |
|---------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Interest rate advantage</b>              | x         | x         |           | x         | x         |           | x         | x         | x         | x         |
| <b>Fixed exchange rate regime</b>           |           |           |           |           | x         | x         | x         | x         |           |           |
| <b>Expectation to join euro area soon</b>   |           |           |           | x         | x         | x         | x         |           |           |           |
| <b>Lack of risk awareness</b>               | x         | x         |           |           |           |           |           |           | x         | x         |
| <b>Herd behavior</b>                        |           |           |           |           |           |           |           |           |           | x         |
| <b>Appreciation trend of local currency</b> |           | x         |           |           |           |           |           |           | x         |           |
| <b>Strong export orientation</b>            |           |           | x         |           |           | x         | x         |           |           |           |
| <b>Scarcity of domestic financing</b>       | x         |           |           |           |           | x         |           |           |           |           |

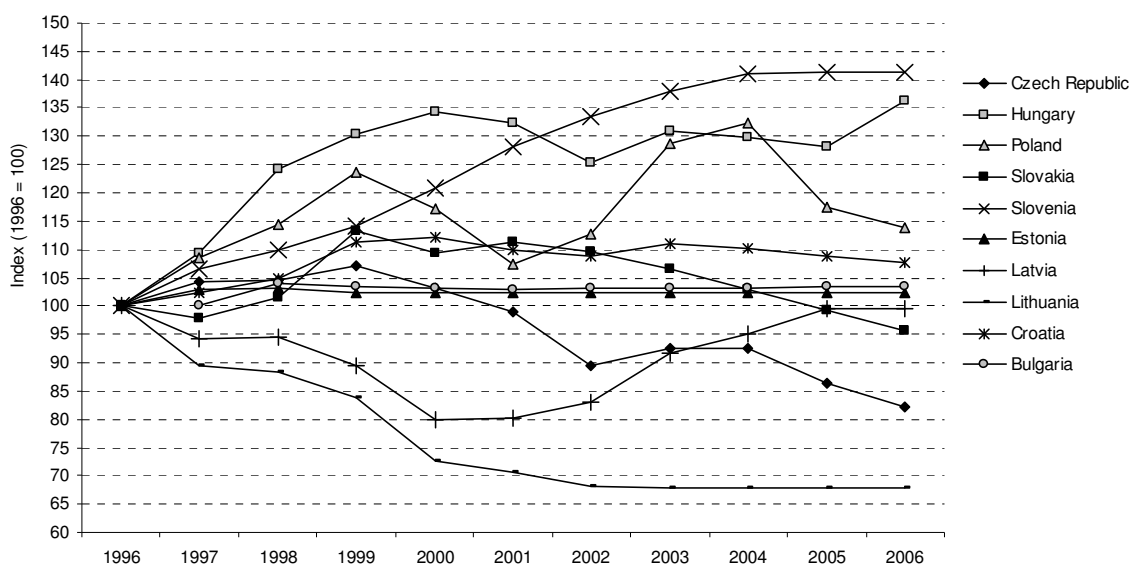
Source: ECB (2006b), OeNB (2007)

So far, only qualitative surveys among households try to analyze drivers of currency substitution by households in CEECs. Table 2 presents a compilation of survey results taken from the European and the Austrian National bank (ECB 2006b, OeNB 2007). Gains from an interest rate advantage, fixed exchange rate regimes and expectations of joining the EMU (European Monetary Union) seem to encourage households to take out foreign currency credit in CEECs. The results for a developed country, Austria, show that lack of risk awareness and herd behavior are the main factors - apart from the interest rate advantage. In the following, potential drivers of currency substitution with a particular focus on foreign currency debt are discussed.

*Exchange rate developments and future integration into EMU:* Exchange rate movements lead to uncertainty about the costs of foreign currency debt. If the domestic currency appreciates, currency substitution of liabilities can result in gains via decreasing costs of liabilities. If the domestic currency depreciates, currency substitution of assets can result in

gains because the assets don't lose value. Annual bilateral nominal exchange rate movements of the eleven CEECs against the euro/ecu are shown in figure 7a and 7b.

**Figure 7a: Exchange rate developments against the euro, 9 CEECs (excl. BG and RO), Index (1996 = 100; for BG 1997 = 100), 1996 - 2006**



Source: Eurostat (2007), National banks (2007)

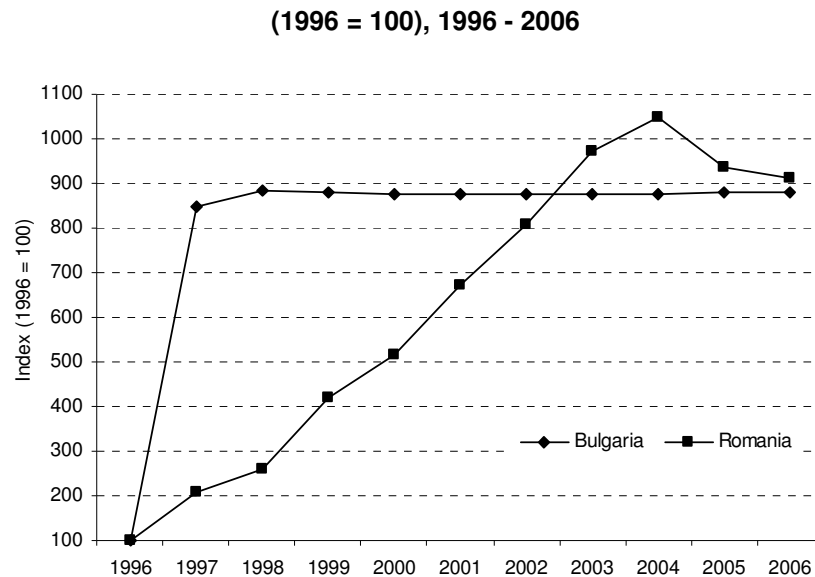
Some new EU member states have adopted currency board or similar arrangements based on the euro/ecu. Bulgaria established a currency board with the German mark in 1997 when it had been in a banking crisis and after several stabilization attempts had failed (Gulde 1999; see figure 7b<sup>23</sup>). This stabilization program was successful in curbing inflation and stabilizing the exchange rate (see figure 7b and the appendix). The Bulgarian currency board with the German mark as nominal anchor was replaced by the EUR in 1999. Romania officially maintained a floating regime but the country followed unofficial exchange rate targets (Nerlich 2002). The Romanian leu continued to weaken against the euro over 1996 to 2004 (figure 7b).

Slovenia has already been fully integrated into EMU at the beginning of 2007. In Lithuania, the Lita had been fixed to the USD until February 2002, when the nominal anchor was changed to the euro (figure 7a). In 2003, the EUR was monetized leading to a unilateral de facto currency substitution (Luchtmeier 2005). Latvia implemented a fixed parity to the SDRs (Special drawing rights of the IMF) in 1994. In May 2005 it entered ERM II. Hungary and the

<sup>23</sup> For Bulgaria, 1997 has been chosen as the base year in figure 7b due to the change in currency regime.

Czech Republic have postponed euro introduction to 2010 (Ritzberger-Grünwald and Stix 2007). Slovakia is member of ERM II (Exchange Rate Mechanism II) since November 2005 and euro adoption is still unclear due to the relatively high exchange rate volatility<sup>24</sup>.

**Figure 7b: Exchange rate developments against the euro, Bulgaria and Romania, Index**



Source: Eurostat (2007)

As regards currency substitution, Ritzberger- Grünwald and Stix (2007, 97) report that “[...] the increase in demand [for euro] due to anticipation [of integration into EMU] is stronger than the decrease in demand due to economic stabilization“. The portfolio behavior of economic agents is already adjusting to future full euro membership and the perception of a strong euro adds to its attractiveness (Stix 2004; Honohan 2007). Even low volatility of exchange rates might provide a reason for economic agents to substitute for the foreign currency to obtain an “optimal” portfolio composition (Honohan 2007).

*Inflation:* Empirical research has not paid much attention to the impact of inflation on currency substitution of debt held by households despite the known fact that they contribute to the uncertainty of the amount of the repayment. In the late 80ies and mid 90ties, several CEECs experienced hyperinflation in terms of inflation rates above 50 percent lasting at least for one month. The appendix shows the average year on year change in the consumer price index of the 11 CEECs. Temporary hyperinflation has inter alia been caused by the lifting of price controls during transformation. Since the mid 90ies, inflation has been at relatively low

<sup>24</sup> Daily and monthly data reveal volatility.



levels in the CEECs with the exception of Bulgaria (1058 percent) and Romania (155 percent) in 1997 where high inflation flared up again after disinflation had begun. Bulgaria and Romania consequently faced high levels of currency substitution of assets held by the private sector: 55 (34) percent of private deposits<sup>25</sup> were denominated in foreign currency in Bulgaria (Romania) in 1997 (OeNB 2007). Positive evidence for inflation causing currency substitution of deposits in seven EU periphery countries over 1994-2001 was found by Selçuk (2003). The author argues that he finds evidence for currency substitution of liquidity. I argue that deposits in foreign currency are very much likely to be used as store of value, particularly in transition economies with financial and capital markets still in development<sup>26</sup>. Experiences of high inflation enter long-lasting memories of economic agents. Persistent currency substitution of assets could consequently be a legacy of the countries' inflationary past. However, Stix (2004) and Ritzberger-Grünwald and Stix (2007) found in their qualitative surveys conducted among households in CEECs that inflation (and exchange rate expectations) do not seem to play a role in the decision of currency substitution of assets in times of moderate inflation and exchange rate movements. Other factors such as distrust in the banking system seem to be more important.

*Banking crises:* Distrust in the stability of the local financial system turned out to be a crucial factor for currency substitution of both - liabilities and assets - in emerging markets. Komárek and Melecký (2003) find that former occurrence of financial crises has been a motive for currency substitution of assets. Their analysis covers households in the Czech Republic over 1994-2001. CEECs experienced two waves of banking crises. First, banking crises occurred during the transformation process at the beginning of the 90ies when the one-tier banking system was broken up. The second wave of crises in the late 90ies was caused by instability of the newly created banking system. Examples are the Czech Republic, Bulgaria, Romania and Slovakia between 1996 and 2001 (Ritzberger-Grünwald and Stix 2007). Banking sector reforms have been implemented to support financial market stability. The banking sector reform index<sup>27</sup> published by the European Bank for Reconstruction and development (EBRD)

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<sup>25</sup> Private deposits include deposits held by non-financial private enterprises and households.

<sup>26</sup> Foreign currency liquidity is difficult to measure – not only due to the role of the black market and fraud. Nevertheless, deposits are mostly used as proxy for foreign currency in circulation (e.g. Calvo and Végh 1993 raise this issue).

<sup>27</sup> Index of banking sector reform: 1: little progress beyond establishment of a two-tier system.; 2: significant liberalization of interest rates and credit allocation; limited use of directed credit or interest rate ceilings.; 3: substantial progress in establishment of bank solvency and of a framework for prudential supervision and regulation; full interest rate liberalization with little preferential access to cheap refinancing; significant lending to private enterprises and significant presence of private banks.; 4: significant movement of banking laws and regulations towards BIS standards; well-functioning banking competition and effective prudential supervision;

reports substantial progress with Romania which has been lagging behind the other CEECs (table 3).

**Table 3: Index of banking sector reform**

|           | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|-----------|------|------|------|------|------|------|------|------|------|------|------|
| <b>CZ</b> | 3.0  | 3.0  | 3.0  | 3.3  | 3.3  | 3.7  | 3.7  | 3.7  | 3.7  | 4.0  | 4.0  |
| <b>SK</b> | 2.7  | 2.7  | 2.7  | 2.7  | 3.0  | 3.3  | 3.3  | 3.3  | 3.7  | 3.7  | 3.7  |
| <b>BG</b> | 2.0  | 2.7  | 2.7  | 2.7  | 3.0  | 3.0  | 3.3  | 3.3  | 3.7  | 3.7  | 3.7  |
| <b>PL</b> | 3.0  | 3.0  | 3.3  | 3.3  | 3.3  | 3.3  | 3.3  | 3.3  | 3.3  | 3.7  | 3.7  |
| <b>HU</b> | 3.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  |
| <b>RO</b> | 3.0  | 2.7  | 2.3  | 2.7  | 2.7  | 2.7  | 2.7  | 2.7  | 3.0  | 3.0  | 3.0  |
| <b>LT</b> | 3.0  | 3.0  | 3.0  | 3.0  | 3.0  | 3.0  | 3.0  | 3.3  | 3.3  | 3.7  | 3.7  |
| <b>LV</b> | 3.0  | 3.0  | 2.7  | 3.0  | 3.0  | 3.3  | 3.7  | 3.7  | 3.7  | 3.7  | 3.7  |
| <b>LV</b> | 3.0  | 3.0  | 2.7  | 3.0  | 3.0  | 3.3  | 3.7  | 3.7  | 3.7  | 3.7  | 3.7  |
| <b>EE</b> | 3.0  | 3.3  | 3.3  | 3.7  | 3.7  | 3.7  | 3.7  | 3.7  | 4.0  | 4.0  | 4.0  |
| <b>HR</b> | 2.7  | 2.7  | 2.7  | 3.0  | 3.3  | 3.3  | 3.7  | 3.7  | 4.0  | 4.0  | 4.0  |

Source: EBRD (2007)

Increasing banking stability might convince people to refrain from holding cash in foreign currency “under the mattress” as a store of value. In fact, there has been a move from the use of foreign currency cash as a store-of-value to transaction purposes (Ritzberger-Grünwald and Stix 2007). In addition, one would expect that households with an increasing optimism about deposit safety would hold less foreign currency cash. Table 1 shows that the percentage of households holding foreign cash has declined but is still at a level of more than 30 percent in Croatia, Slovakia, the Czech Republic and Slovenia. Despite ongoing banking sector reform, empirical evidence of de facto currency substitution of assets and liabilities has been persistent— though at different levels (see section 3.1. and 3.2.).

*Shopping and holidays abroad:* While cash has been widely used as a store-of-value in times of instable banking systems, cash is nowadays mainly held for shopping tours and holidays in the euro area (Ritzberger-Gruenwald and Stix 2007). The role of the black market needs to be considered as well. Purchases in illegal markets may be more foreign currency intensive (Agénor and Khan 1996). Komárek and Melécky (2003) find evidence that the existence of a large illegal or underground economy drives currency substitution of assets. The purchase of

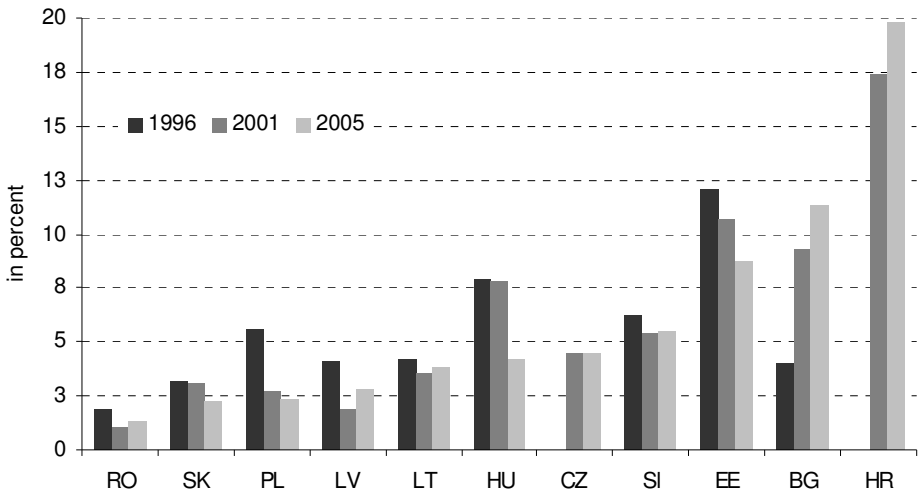
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significant term lending to private enterprises; substantial financial deepening. 4+: standards and performance norms of advanced industrial economies: full convergence of banking laws and regulations with BIS standard; provision of full set of competitive banking services.

luxurious consumer durables abroad might add to currency substitution of liabilities. If a household took out a credit for consumption purposes abroad, such as shopping or holidays, they could be inclined to take it in foreign currency.

*Income in foreign currency:* Tourism income in foreign currency has played a substantial role in the accumulation of foreign currency cash holdings of households in South Eastern Europe because mainly private dwellings are offered for rent (Ritzberger-Grünwald and Stix 2007). Figure 8 gives an insight into the role of tourism income relative to nominal GDP. While tourism income accounts for about 20 percent of GDP nom in Croatia and is slightly increasing in Rumania, Bulgaria, Latvia and Lithuania since 2001, it has been decreasing in the remaining countries. The receipts shown in figure x include expenditures by international inbound visitors, including payments to national carriers for international transport (WTO 2007<sup>28</sup>).

**Figure 8: Receipts from international tourism in percent of nominal GDP, 11 CEECs, 1996, 2001, 2005<sup>29</sup>, in percent**



Source: WTO (2007)

Remittances and income from daily migration to EU member countries add to currency substitution of cash and deposits, too. People with close relatives working abroad hold more euro cash. These findings are reported by Ritzberger-Grünwald and Stix (2007) based on the

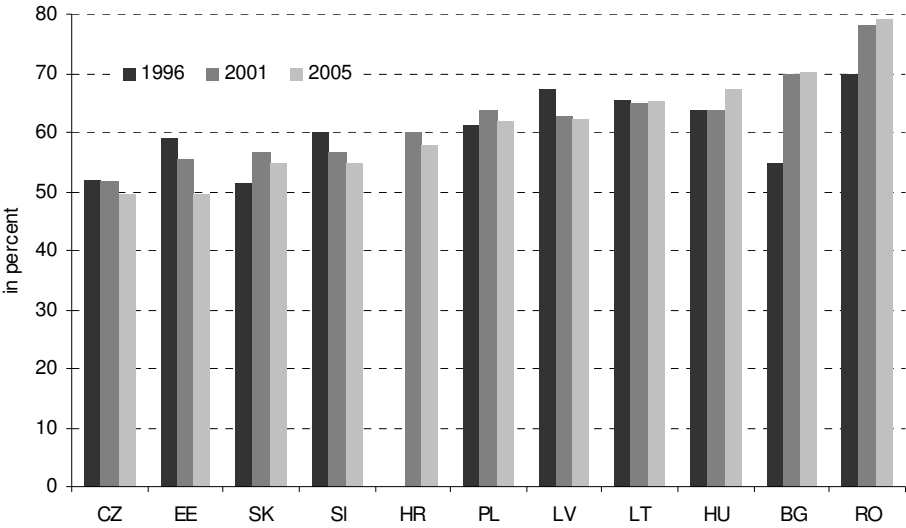
<sup>28</sup> The data include expenditures by international inbound visitors, including payments to national carriers for international transport, any other prepayment made for goods or services received in the destination country and receipts from same-day visitors, except in cases where these are so important as to justify a separate classification (WTO 2007).

<sup>29</sup> Values of 2002 instead of 2001 for CZ, value of 2004 instead of 2005 for SK due to missing data. Values for 2006 not available.

conducted surveys among households in CEECs. In turn, increasing currency substitution of assets and cash can encourage currency substitution of debt – causality needs to be analyzed. Luca and Petrova (2007) showed at the firm level that foreign currency deposits drive dollarisation of liabilities in CEECs.

*Consumption expenditure:* Increasing net wealth of households should increase consumption and in general the ability of households to take out loans, including foreign currency loans, due to their increasing credibility. Data on consumption expenditure shows that over 1996 to 2001, Romania experienced the highest increase in final consumption expenditure to nominal GDP from 69 percent to 78 percent, while it decreased in Slovenia, Estonia, Lithuania and Latvia (see figure 9). From 2001 to 2006, the households’ ability to consume declined except for Lithuania, Hungary, Bulgaria and Romania. The decline is not surprising in view of a decreasing share of annual disposable income in nominal GDP in most CEECs (GMID 2007). Bulgaria and Slovakia were the only countries out of the sample which experienced an increase in the latter.

**Figure 9: Household final consumption expenditure in percent of GDP nom., 11 CEECs, 1996 – 2006, in percent**



Source: Worldbank (2008)

*Interest rate advantage:* Lower borrowing costs for foreign currency loans stimulate the demand for foreign currency credit. Sirtaine and Skamnelos (2007) find evidence for 11 CEECs over 2000-2006. For example in Croatia, average lending rates for a loan denominated in euro were 4.51 percentage points lower than interest rates on domestic

currency loans in 2006. Table 4 shows the average lending interest rate development for credit denominated in domestic and foreign currency in CEECs over 1996 to 2006.

**Table 4: Average domestic and foreign currency lending rates in CEE-11, percent per annum**

|      | Average domestic<br>currency lending rate | Average foreign<br>currency lending rate |
|------|-------------------------------------------|------------------------------------------|
| 1996 | 48.49                                     | 11.22                                    |
| 1997 | 40.12                                     | 9.76                                     |
| 1998 | 20.05                                     | 8.61                                     |
| 1999 | 18.90                                     | 8.14                                     |
| 2000 | 16.28                                     | 8.20                                     |
| 2001 | 14.42                                     | 7.95                                     |
| 2002 | 11.94                                     | 7.67                                     |
| 2003 | 9.49                                      | 6.83                                     |
| 2004 | 9.93                                      | 6.36                                     |
| 2005 | 8.31                                      | 5.82                                     |
| 2006 | 7.68                                      | 6.08                                     |

Source: IMF (2008) and Worldbank (2008)

It may not only be demand that pushes currency substitution in CEECs. The role of banks as financial intermediary and primary supplier of finance needs to be considered as well, because banks' lending activities are not only demand-driven by the need for additional external finance.

*Herd behavior:* I expect herd behavior to have a significant impact on currency substitution of credit. Herd behavior refers to a large number of people taking identical actions, e.g. taking out foreign currency credit (Epstein and Tzanninis 2005). While Epstein and Tzanninis (2005) present positive evidence for Austria, I expect herd behavior to have also played a role in the recent boom of foreign currency borrowing.

From the point of view of the bank, the following supply side factors can be important drivers of currency substitution:

*Portfolio diversification of banks* plays an important role in commercial banks' policies (Panagopoulos and Spiliotis 1998). They use foreign currency lending to clients as a "natural hedge" of their own foreign currency liabilities by shifting the direct exchange rate risk<sup>30</sup> to the customers. (ECB 2006a).

Empirical studies modeling credit supply apply different input factors as explanatory variables according to their research focus (e.g. Drake and Holmes 1995; Weller 2000; Hale and Arteta 2007). For example, Greenwald and Stiglitz (1990) specified a model displaying bank's credit supply under credit rationing. Their results confirm that the banks' capital and deposits base play a crucial role in determining credit supply (see Weller 2000; Drake and Holmes 1995). I argue that the foreign currency deposit base held by banks could be an incentive to expand lending in foreign currency. The comparison of currency substitution of credit and deposits by households has shown ambiguous developments in the CEECs and calls for a more detailed analysis. Luca and Petrova (2007) argue in their empirical paper that banks operating in CEECs have the desire to match their currency portfolios even beyond regulatory requirements.

*Higher margins for banks:* Higher margins in the foreign currency business<sup>31</sup> may induce banks to promote currency substitution. Although domestic currency lending rates are at a high level compared to developed markets of the EU, the spread between lending and deposit rates in foreign currency might be larger than with domestic currency loans and deposits. In addition, one could question whether lower refinancing rates (EURIBOR or respective LIBOR) at the interbank market encourage banks to promote foreign currency denominated loans.

*Changes in competition - foreign ownership in banking:* Again, Komárek and Melécky (2003) provide empirical evidence for the sharp increase in openness to be an important factor in currency substitution of assets. Changes in competition due to financial liberalization and

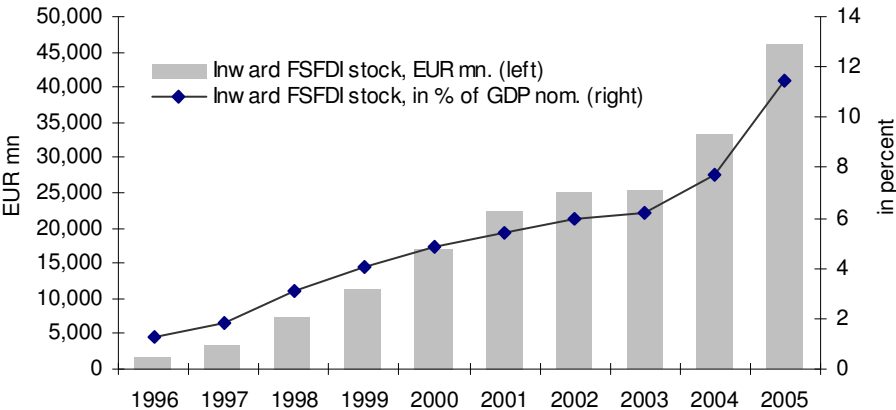
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<sup>30</sup> An indirect exchange rate risk remains due to the potential default of the debtor in case of a depreciation of the domestic currency.

<sup>31</sup> The reduced models of credit supply and demand exclude the role of non-interest costs. In interpreting the results these costs will need to be taken into account as financial development in CEECs and with it decreasing interest rates will shift the majority part of revenues of banks to non-interest income.

ongoing regulatory reforms encourage banks to expand credit beyond what can be funded by the domestic deposit base (ECB 2006a). In particular, the large share in foreign ownership in the market needs to be taken into consideration. Figure 10 shows the increase in the stock of foreign direct investment in the financial sector from 1 percent of nominal GDP in 1996 to about 7.5 percent of nominal GDP in 2005. The majority presence of foreign owned banks might promote euroisation in the transition economies. In 2004, foreign ownership in total banking assets accounted for 77.5 percent in CEE-10 (CEE-11 except Romania; Allen, Bartoloro, Kowalewski 2005). Financial currency substitution thus might not necessarily be a home-grown phenomenon in CEECs.

**Figure 10: Average inward FSFDI stock, 10 CEECs (excl. Romania) in EUR mn and in percent of GDP, 1996 to 2005<sup>32</sup>**



Source: Gábor and Stankovsky (2006), own compilation

Parent banks located in the EMU facilitate refinancing in euro. It can be argued that foreign owned banks promote a more diversified range of lending products because they have better access to sources of finance and more valuable know-how in risk management compared to domestic banks. This might have strengthened growth of foreign currency credit in CEECs. The need for further research on this issue is highlighted by the ECB (2006b).

Altogether, the drivers of foreign currency debt of private households in CEECs seem to be manifold compared to the main drivers identified for emerging markets in general. Besides the institutional development, lowered inflation and increasing monetary credibility so far, demand factors such as income in foreign currency, interest rate advantages, shopping or holiday purposes abroad or herd behavior push this development. Supply factors are

<sup>32</sup> Data for 2006 only available for SK, EE, LT, LV, HR.

portfolio diversification of banks, higher margins in the foreign currency business and foreign ownership in banking. The particular role of expected accession to the EMU needs to be considered as well. But, the developments among the eleven CEECs differ. While in some countries (e.g. the Czech Republic and Slovakia) currency substitution is a minor issue, it is very popular in other countries (e.g. Croatia, Estonia, Latvia).

### **3.4. Risks of foreign currency debt at the household, bank and country level in CEECs**

While the scenario of potential risks depicted in section 2 could also apply to CEECs in case of greater volatility of exchange and inflation rates, another phenomenon needs to be considered in CEECs: credit growth.

Credit growth has attracted significant attention from scholars with particular focus on stability of financial development (see ECB 2006b for a review on empirical literature on credit booms). Deepening financial intermediation is important for the economy to grow and can be seen as a natural adjustment of financial development in emerging markets. But “not every expansion of intermediary activity will be beneficial” (Wachtel 2003, 44). Gourinchas, Vlades and Landerretche (2001) show how dangerous lending booms can be and identify credit growth as a determinant for banking crises. Risks can particularly stem from the size of the commercial banks’ open foreign currency positions despite the transfer of exchange rate risk to their customers. In turn, this creates substantial indirect foreign exchange risks from a potential deterioration of the (unhedged) borrowers’ debt servicing capacity following e.g. a possible depreciation of the domestic currency. Most foreign currency loans seem to be collateralized by dwellings (or cars). A potential shock in the housing market (decreasing housing prices) could also have a negative impact on the performance of foreign currency loans. It might be the case that too strong optimism about future returns may boost asset valuations and thus the owner’s net worth, which then feeds back into higher credit demand and a further increase in asset prices<sup>33</sup>, finally leading to a bubble in the housing market (Papademos 2005). A drop in housing prices might decrease the ability to take out domestic and foreign currency lending<sup>34</sup> as means of securitisation are too low (missing).

Do foreign owned banks face the same tight regulatory limits on e.g. the volume of euro denominated credit, or are these limits relaxed if the foreign parent bank is located in the euro area? On the one hand, one might argue that solvency risk is less pronounced, if the

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<sup>33</sup> It must be noted that there is a gap between urban areas and the country side which needs to be kept in mind.

<sup>34</sup> This would go hand in hand with other economic developments (e.g. decreasing purchasing power).



foreign bank originates from a country where the domestic currency is the respective foreign currency of substitution of the host country. In the event of a currency crisis in the host country, the foreign bank may be more willing and able to serve clients holding deposits and loans denominated in that foreign currency. De Haas and Van Lelyveld (2006) find evidence that foreign banks did not contract their credit base in times of crisis. It is argued that foreign owners import stability also during the early years of transition (Kraft, 2005, 352). On the other hand, the high openness of these countries and the multilateral integration of several countries into the EMU could lead to potential contagion of external shocks.

In CEECs, concerns have been raised about the speed of credit growth - particularly of private credit<sup>35</sup> growth, because history has shown that banking distress (crisis) has often been preceded by excessive credit growth<sup>36</sup> (ECB 2006b). This is of course not the inevitable consequence, but the development must be carefully monitored. Most recent research on credit expansion in CEECs shows that none of the eleven CEECs has experienced excessive total private credit levels above the equilibrium level of private credit to GDP in transition economies (Backé, Égert and Zumer 2007). But in the years to come, this could be the case for Croatia, Estonia, Latvia, Hungary, Slovenia and Bulgaria if the rise in credit growth continues. Has the level of foreign currency debt already surpassed a certain threshold (equilibrium) level?

Cottarelli, Dell’Ariccia, Vladkova-Holar (2005), Boissay, Calvo-Gonzalez and Kozluk (2006) and Backé, Égert, Zumer (2007) have tested whether total private credit growth is consistent with the structural characteristics of the transition economies in CEE. The application of slightly different methods of time-series analysis leads to diverging results. Disaggregated data also distinguishing between domestic and foreign currency-denominated credit showed that no particular credit sector has excessively driven credit growth in CEECs (Boissay et al 2006). If credit growth continued, this could be the case in the future. I argue that it is important to analyse particular credit market segments and their risk exposure, e.g. of households or small and medium enterprises (SMEs). The Hungarian National Bank (Bódnar 2007) conducted a survey in 2005 on the exchange risk exposure of Hungarian SMEs and

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<sup>35</sup> Private credit refers to credit to the private sector including households and non-financial enterprises.

<sup>36</sup> For more on this issue see e.g. Hilbers, Otter-Robe and Pazarbaşıoğlu (2006). One of the reasons for potential distress is the following: Assuming procyclicality of lending, risks may be underestimated by banks during the expansionary phase of the credit cycle and lead to the application of lower credit standards. The “quality” of borrowers may thus decline and lead to higher risk of default during the next economic downturn.

found that only few were aware of the exchange rate risk and hedged. In addition, a shift in the exchange rate can produce an unexpected negative effect on domestic SMEs.

Altogether, currency substitution of liabilities should be a “hot topic” among bankers, supervisors and regulators. In addition, increasing credit growth raises concerns about its stability. The policy response is promoting the integration into the EU and EMU, but needs high flexibility of adjustment to external shocks for a successful and stable integration into the currency area (Luchtmeier 2005).

#### **4. Summary and Conclusion**

The aim of this paper is to identify the mechanisms driving de facto currency substitution of assets and liabilities and discuss associated risks for emerging market economies. What are the risks for households, banks and the whole country? Any economic agent strives to optimize his/her currency portfolio in order to maximize the return and minimize costs as argued by the portfolio approach. The choice of currency is one of the crucial determinants of the future return on assets or cost of credit. Research has shown that high inflation, lack of monetary credibility and a lack of financial depth induce economic agents to invest and borrow in foreign currency in emerging markets. Risks occur in the event of unfavorable exchange rate and interest rate developments. If a large number of clients were affected, banks would face debt default and the withdrawal of assets could result in a banking crisis. In addition, a large volume of de facto currency substitution would contribute to the build-up of total external debt of a country and limit the effectiveness of monetary policy. What about CEECs?

Lower financing costs of foreign currency liabilities, i.e. lower interest rates in foreign currency, affect the choices of economic agents in favor of currency substitution of liabilities. Currency substitution in CEECs seems to be a legacy of the past, too. At the same time, economic agents seem to anticipate future integration into the EMU. At the demand-side, the sharp increase in openness of the financial system, continuing distrust in the banking system, a large underground economy, remittances as well as tourism income in foreign currency (mostly euro) seem to cause currency substitution at the household level. However, the development of currency substitution differs among the eleven CEECs. Follow-up research on currency substitution of liabilities held by households will empirically test the potential drivers using panel data techniques. Future research should also analyze the domestic debt structure of households in emerging markets including different types of debt (e.g. foreign currency-indexed, inflation-indexed debt, the role of short-term domestic debt).

Risks seem to be underestimated in CEECs. In particular households and corporations not involved in cross-border trade could be negatively affected by adverse exchange rate and inflation developments because the real value of foreign currency debt cannot be forecasted. If a large share in total credit, or a certain group of creditors make default, banking stability may be endangered. Recent research on CEECs (e.g.Boissay et al 2006; Backé, Ègert and Zumer 2007) points out that credit growth (and with it growth in foreign currency lending) needs to be monitored. Further research is needed.

At the supply-side, the following factors promote currency substitution in CEECs: hedging of banks' liabilities position, foreign ownership in banking and potential higher return on foreign currency business. Differences in risk management and portfolio allocation among foreign and domestic banks need to be part of future analysis as suggested by Luca and Petrova (2007). Ritzberger-Grünwald and Stix (2007, 98) conclude their paper with the remark that “[.] it would be interesting to test whether a multivariate analysis confirms our conclusions and findings [of drivers of currency substitution of cash]. As this issue affects both the effectiveness of monetary policy and cash logistics, we consider this a worthwhile undertaking.” The same accounts for the mechanisms driving foreign currency debt of private households in CEECs.

Follow-up research of this paper will account for demand and supply side factors. The group of CEECs should be analyzed separately. Their experience of currency substitution differs from other emerging markets because currency substitution persists although banking stability has been increasing so far and inflation and exchange rate fluctuations have been moderate. Future research will reveal the particular mechanisms at work in more detail.

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## Appendix

The countries are tabulated in ascending order of the values of 2006 of the first table on this page.

### Private credit in percent of GDP nom.

in %

|                   | 1996   | 1997   | 1998   | 1999   | 2000   | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| <b>CZ</b>         | 51.00% | 57.88% | 53.29% | 48.45% | 42.99% | 36.62% | 27.80% | 27.55% | 28.81% | 31.93% | 36.00% |
| <b>HU</b>         | 20.68% | 22.87% | 22.73% | 25.94% | 24.42% | 26.85% | 28.13% | 35.80% | 41.10% | 45.39% | 51.68% |
| <b>PL</b>         | 19.04% | 18.47% | 20.36% | 23.55% | 25.86% | 27.36% | 27.74% | 28.23% | 27.22% | 27.17% | 29.53% |
| <b>SK</b>         | 41.74% | 54.77% | 48.86% | 56.97% | 45.29% | 37.74% | 35.92% | 27.86% | 27.58% | 30.26% | 34.65% |
| <b>SI</b>         | 23.65% | 22.78% | 25.12% | 29.01% | 32.91% | 35.07% | 35.64% | 37.08% | 41.30% | 50.84% | 59.34% |
| <b>EE</b>         | na     | 22.20% | 24.76% | 23.30% | 22.64% | 22.77% | 24.48% | 27.83% | 35.52% | 46.81% | 65.37% |
| <b>LV</b>         | 5.79%  | 7.05%  | 12.05% | 13.44% | 15.33% | 19.81% | 25.89% | 30.76% | 37.21% | 47.13% | 62.42% |
| <b>LT</b>         | 11.02% | 8.60%  | 8.98%  | 10.83% | 9.92%  | 9.92%  | 11.76% | 15.56% | 22.10% | 28.40% | 39.24% |
| <b>BG</b>         | 24.21% | 13.66% | 8.77%  | 10.61% | 11.48% | 12.68% | 16.12% | 22.37% | 30.22% | 39.27% | 41.06% |
| <b>RO</b>         | 24.76% | 14.07% | 15.65% | 10.44% | 9.26%  | 10.09% | 9.91%  | 11.88% | 14.66% | 17.76% | 22.56% |
| <b>HR</b>         | na     | na     | na     | 20.69% | 18.90% | 19.86% | 21.61% | 22.50% | 21.80% | 22.61% | 26.04% |
| <b>Avg CEE-11</b> | 24.66% | 24.23% | 24.06% | 24.84% | 23.54% | 23.52% | 24.09% | 26.13% | 29.77% | 35.23% | 42.54% |

Source: OeNB (2007) and IMF (2008)

### Annual growth rate of private credit

in %

|                   | 1996    | 1997    | 1998    | 1999    | 2000   | 2001    | 2002    | 2003    | 2004   | 2005   | 2006   |
|-------------------|---------|---------|---------|---------|--------|---------|---------|---------|--------|--------|--------|
| <b>RO</b>         | 10.37%  | -36.14% | 33.31%  | -40.12% | 6.12%  | 20.88%  | 5.89%   | 29.94%  | 42.62% | 55.51% | 58.19% |
| <b>HR</b>         | na      | na      | na      | 10.43%  | -2.40% | 16.64%  | 20.03%  | 11.57%  | 4.93%  | 13.03% | 25.34% |
| <b>PL</b>         | 10.10%  | 9.11%   | 22.41%  | 18.19%  | 29.28% | 21.13%  | 0.02%   | -7.07%  | 2.73%  | 19.12% | 20.46% |
| <b>SK</b>         | 28.83%  | 48.11%  | -6.09%  | 11.03%  | -7.30% | -11.59% | 5.16%   | -12.97% | 14.68% | 23.58% | 32.03% |
| <b>CZ</b>         | 9.01%   | 17.67%  | 0.65%   | -7.20%  | -3.22% | -4.51%  | -12.01% | 0.11%   | 12.74% | 26.60% | 27.94% |
| <b>LT</b>         | -4.45%  | 6.67%   | 18.13%  | 23.78%  | 10.63% | 9.82%   | 31.21%  | 44.90%  | 56.51% | 46.34% | 58.95% |
| <b>BG</b>         | -32.02% | -48.11% | -26.08% | 29.24%  | 21.67% | 22.74%  | 38.34%  | 48.25%  | 49.62% | 42.33% | 21.31% |
| <b>HU</b>         | 6.61%   | 25.53%  | 3.17%   | 22.62%  | 8.70%  | 25.73%  | 24.68%  | 34.14%  | 26.46% | 19.11% | 14.55% |
| <b>SI</b>         | 23.19%  | 4.92%   | 17.86%  | 24.57%  | 17.60% | 12.11%  | 8.74%   | 9.36%   | 17.56% | 29.66% | 25.58% |
| <b>LV</b>         | -43.54% | 49.86%  | 86.23%  | 26.90%  | 41.69% | 41.29%  | 38.97%  | 19.15%  | 35.31% | 47.56% | 64.48% |
| <b>EE</b>         | na      | 17.23%  | 26.72%  | -0.66%  | 13.47% | 13.49%  | 21.07%  | 24.47%  | 40.86% | 55.42% | 65.16% |
| <b>Avg CEE-11</b> | 0.90%   | 9.48%   | 17.63%  | 10.80%  | 12.39% | 15.25%  | 16.55%  | 18.35%  | 27.64% | 34.39% | 37.64% |

Source: OeNB (2007)



The countries are tabulated in ascending order of the values of 2006 of the first table on this page.

**Foreign currency private credit in percent of GDP nom.**

in %

|                   | 1996   | 1997   | 1998   | 1999   | 2000   | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| <b>CZ</b>         | na     | 9.38%  | 9.88%  | 9.62%  | 7.36%  | 5.57%  | 3.97%  | 3.64%  | 3.52%  | 3.46%  | 3.70%  |
| <b>SK</b>         | na     | na     | na     | na     | na     | na     | na     | 5.14%  | 5.94%  | 6.76%  | 7.24%  |
| <b>PL</b>         | 2.35%  | 2.70%  | 3.91%  | 5.03%  | 5.43%  | 6.56%  | 7.51%  | 8.44%  | 7.45%  | 6.83%  | 7.93%  |
| <b>BG</b>         | 15.45% | 11.51% | 3.90%  | 4.26%  | 4.38%  | 4.37%  | 6.39%  | 9.70%  | 13.96% | 18.99% | 18.74% |
| <b>RO</b>         | 9.13%  | 7.71%  | 9.22%  | 6.02%  | 5.51%  | 6.04%  | 6.20%  | 6.86%  | 8.57%  | 10.42% | 10.83% |
| <b>HU</b>         | na     | na     | na     | na     | 7.81%  | 8.05%  | 7.36%  | 11.55% | 14.81% | 19.34% | 25.73% |
| <b>LT</b>         | 3.86%  | 3.12%  | 4.22%  | 6.17%  | 6.48%  | 6.60%  | 6.77%  | 8.16%  | 12.48% | 17.42% | 22.80% |
| <b>SI</b>         | 2.87%  | 1.87%  | 2.35%  | 3.36%  | 4.58%  | 5.77%  | 7.36%  | 9.35%  | 13.06% | 25.05% | 36.03% |
| <b>HR</b>         | na     | na     | na     | 17.28% | 15.96% | 16.06% | 16.37% | 16.10% | 15.62% | 16.53% | 17.92% |
| <b>LV</b>         | 3.22%  | 4.13%  | 6.62%  | 7.57%  | 8.78%  | 10.05% | 14.49% | 16.66% | 21.42% | 31.68% | 45.75% |
| <b>EE</b>         | na     | 11.93% | 16.43% | 16.89% | 16.83% | 17.03% | 19.30% | 21.59% | 25.66% | 35.06% | 50.22% |
| <b>Avg CEE-11</b> | 6.15%  | 6.54%  | 7.06%  | 8.47%  | 8.31%  | 8.61%  | 9.57%  | 10.65% | 12.95% | 17.41% | 22.44% |

Source: OeNB (2007) and IMF (2008)

**Annual growth rate of foreign currency private credit**

in %

|                              | 1996    | 1997    | 1998    | 1999    | 2000    | 2001    | 2002    | 2003   | 2004   | 2005    | 2006   |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|--------|--------|---------|--------|
| <b>CZ</b>                    | na      | -5.57%  | 15.06%  | -0.60%  | -16.47% | -15.25% | -17.44% | -7.28% | 4.14%  | 12.39%  | 21.31% |
| <b>SK</b>                    | na      | na      | na      | na      | na      | na      | na      | 18.77% | 34.02% | 28.07%  | 23.60% |
| <b>PL</b>                    | na      | 29.10%  | 60.84%  | 31.59%  | 27.08%  | 38.42%  | 12.81%  | 2.69%  | -5.99% | 9.41%   | 28.74% |
| <b>BG</b>                    | -0.09%  | -31.46% | -60.99% | 16.60%  | 15.62%  | 10.99%  | 59.02%  | 62.24% | 59.34% | 49.05%  | 14.48% |
| <b>RO</b>                    | na      | -5.13%  | 43.37%  | -41.41% | 9.44%   | 21.59%  | 10.66%  | 20.11% | 44.34% | 56.05%  | 29.45% |
| <b>HU</b>                    | na      | na      | na      | na      | 21.27%  | 17.87%  | 8.79%   | 65.32% | 41.26% | 40.89%  | 33.83% |
| <b>LT</b>                    | -6.05%  | 10.25%  | 53.02%  | 50.23%  | 26.77%  | 11.85%  | 13.62%  | 31.84% | 68.73% | 58.89%  | 50.54% |
| <b>SI</b>                    | -4.57%  | -29.19% | 34.34%  | 54.54%  | 41.17%  | 32.61%  | 36.42%  | 33.48% | 47.50% | 101.99% | 54.77% |
| <b>HR</b>                    | na      | na      | na      | 8.07%   | -1.27%  | 11.67%  | 12.46%  | 5.33%  | 5.13%  | 15.32%  | 17.93% |
| <b>LV</b>                    | -45.26% | 57.91%  | 74.65%  | 30.02%  | 44.06%  | 25.22%  | 53.23%  | 15.32% | 43.81% | 72.31%  | 79.33% |
| <b>EE</b>                    | na      | 18.59%  | 56.37%  | 8.56%   | 16.41%  | 14.15%  | 27.64%  | 22.45% | 31.16% | 61.11%  | 69.42% |
| <b>Avg CEE-10 (excl. SK)</b> | -13.99% | 5.56%   | 34.58%  | 17.51%  | 18.41%  | 16.91%  | 21.72%  | 24.57% | 33.94% | 47.74%  | 39.98% |

Source: OeNB (2007)

**Share of foreign currency in total private credit**

in %

|                   | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|-------------------|------|------|------|------|------|------|------|------|------|------|------|
| <b>CZ</b>         | na   | 0.16 | 0.19 | 0.20 | 0.17 | 0.15 | 0.14 | 0.13 | 0.12 | 0.11 | 0.10 |
| <b>SK</b>         | na   | na   | na   | na   | na   | na   | na   | 0.18 | 0.22 | 0.22 | 0.21 |
| <b>PL</b>         | 0.12 | 0.15 | 0.19 | 0.21 | 0.21 | 0.24 | 0.27 | 0.30 | 0.27 | 0.25 | 0.27 |
| <b>BG</b>         | 0.64 | 0.84 | 0.44 | 0.40 | 0.38 | 0.34 | 0.40 | 0.43 | 0.46 | 0.48 | 0.46 |
| <b>RO</b>         | 0.37 | 0.55 | 0.59 | 0.58 | 0.59 | 0.60 | 0.62 | 0.58 | 0.58 | 0.59 | 0.48 |
| <b>HU</b>         | na   | na   | na   | na   | 0.32 | 0.30 | 0.26 | 0.32 | 0.36 | 0.43 | 0.50 |
| <b>LT</b>         | 0.35 | 0.36 | 0.47 | 0.57 | 0.65 | 0.67 | 0.58 | 0.52 | 0.56 | 0.61 | 0.58 |
| <b>SI</b>         | 0.12 | 0.08 | 0.09 | 0.12 | 0.14 | 0.16 | 0.21 | 0.25 | 0.32 | 0.49 | 0.61 |
| <b>HR</b>         | na   | na   | na   | 0.84 | 0.84 | 0.81 | 0.76 | 0.72 | 0.72 | 0.73 | 0.69 |
| <b>LV</b>         | 0.56 | 0.59 | 0.55 | 0.56 | 0.57 | 0.51 | 0.56 | 0.54 | 0.58 | 0.67 | 0.73 |
| <b>EE</b>         | na   | 0.54 | 0.66 | 0.72 | 0.74 | 0.75 | 0.79 | 0.78 | 0.72 | 0.75 | 0.77 |
| <b>Avg CEE-11</b> | 0.36 | 0.41 | 0.40 | 0.47 | 0.46 | 0.45 | 0.46 | 0.43 | 0.45 | 0.49 | 0.49 |

Source: OeNB (2007)

The countries are tabulated in ascending order of the values of 2006 of the first table on this page.

**Foreign currency household credit in percent of GDP nom.**

in %

|                   | 1996  | 1997  | 1998  | 1999  | 2000  | 2001  | 2002  | 2003  | 2004   | 2005   | 2006   |
|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| <b>CZ</b>         | na    | 0.27% | 0.25% | 0.19% | 0.17% | 0.18% | 0.08% | 0.04% | 0.04%  | 0.04%  | 0.04%  |
| <b>SK</b>         | na    | na    | na    | na    | na    | na    | na    | 0.09% | 0.04%  | 0.10%  | 0.17%  |
| <b>BG</b>         | 0.03% | 0.03% | 0.02% | 0.02% | 0.06% | 0.11% | 0.22% | 0.43% | 0.83%  | 1.81%  | 2.80%  |
| <b>PL</b>         | 0.14% | 0.20% | 0.40% | 0.56% | 0.75% | 1.51% | 2.32% | 3.10% | 3.17%  | 3.51%  | 4.82%  |
| <b>HU</b>         | na    | na    | na    | na    | 0.05% | 0.13% | 0.19% | 0.41% | 1.03%  | 3.28%  | 7.00%  |
| <b>RO</b>         | 0.04% | 0.02% | 0.03% | 0.06% | 0.09% | 0.12% | 0.23% | 0.63% | 1.49%  | 2.85%  | 3.63%  |
| <b>SI</b>         | 0.00% | 0.00% | 0.00% | 0.05% | 0.07% | 0.07% | 0.08% | 0.09% | 0.42%  | 4.29%  | 6.98%  |
| <b>LT</b>         | 0.13% | 0.05% | 0.11% | 0.34% | 0.55% | 0.64% | 0.67% | 0.84% | 2.28%  | 5.00%  | 7.65%  |
| <b>LV</b>         | 0.20% | 0.33% | 0.59% | 0.84% | 1.31% | 1.78% | 2.84% | 5.20% | 8.89%  | 14.32% | 21.99% |
| <b>EE</b>         | na    | 2.44% | 3.37% | 3.74% | 4.06% | 4.79% | 6.40% | 8.40% | 10.61% | 15.94% | 24.71% |
| <b>HR</b>         | na    | na    | na    | 0.01% | 0.01% | 0.01% | 0.02% | 0.02% | 0.02%  | 0.03%  | 0.03%  |
| <b>Avg CEE-11</b> | 0.09% | 0.42% | 0.60% | 0.65% | 0.71% | 0.93% | 1.30% | 1.75% | 2.62%  | 4.65%  | 7.26%  |

Source: OeNB (2007) and IMF (2008)

**Annual growth rate of foreign currency credit to households**

in %

|                              | 1996    | 1997    | 1998    | 1999     | 2000    | 2001    | 2002    | 2003    | 2004    | 2005    | 2006    |
|------------------------------|---------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|
| <b>CZ</b>                    | na      | -21.30% | 0.92%   | -19.54%  | -3.14%  | 15.25%  | -48.45% | -47.13% | -5.30%  | 22.55%  | 7.38%   |
| <b>SK</b>                    | na      | na      | na      | na       | na      | na      | na      | 24.31%  | -56.52% | 210.54% | 103.88% |
| <b>BG</b>                    | -24.14% | -25.93% | -3.21%  | -7.51%   | 267.72% | 101.79% | 116.60% | 113.28% | 111.07% | 139.39% | 79.35%  |
| <b>PL</b>                    | 24.52%  | 54.19%  | 123.99% | 44.30%   | 58.40%  | 129.38% | 51.56%  | 21.97%  | 8.86%   | 32.33%  | 52.25%  |
| <b>HU</b>                    | na      | na      | na      | na       | 7.88%   | 195.87% | 80.79%  | 122.44% | 178.12% | 241.76% | 114.73% |
| <b>RO</b>                    | 22.47%  | -51.86% | 97.38%  | 87.07%   | 81.43%  | 41.67%  | 112.52% | 197.35% | 171.29% | 145.61% | 58.63%  |
| <b>SI</b>                    | 52.22%  | 431.26% | 40.24%  | 1472.89% | 50.00%  | 2.39%   | 11.63%  | 17.71%  | 418.09% | 980.31% | 75.18%  |
| <b>LT</b>                    | -55.29% | -42.66% | 136.96% | 213.86%  | 94.11%  | 26.64%  | 15.42%  | 38.13%  | 199.13% | 149.80% | 75.96%  |
| <b>LV</b>                    | -52.52% | 104.28% | 96.23%  | 63.19%   | 94.11%  | 48.01%  | 69.70%  | 83.95%  | 91.07%  | 87.71%  | 90.67%  |
| <b>EE</b>                    | na      | 22.96%  | 56.90%  | 17.14%   | 26.90%  | 33.06%  | 50.45%  | 43.68%  | 39.32%  | 77.26%  | 83.31%  |
| <b>HR</b>                    | na      | na      | na      | 17.08%   | 10.18%  | 35.60%  | 35.59%  | 25.58%  | 13.23%  | 22.63%  | 23.90%  |
| <b>Avg CEE-10 (excl. SK)</b> | -5.46%  | 58.87%  | 68.68%  | 209.83%  | 68.76%  | 62.97%  | 49.58%  | 61.70%  | 122.49% | 102.12% | 66.14%  |

Source: OeNB (2007)

**Share of foreign currency in total credit to households**

in %

|                   | 1996    | 1997    | 1998    | 1999    | 2000    | 2001    | 2002    | 2003    | 2004    | 2005    | 2006    |
|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>CZ</b>         | na      | 4.541%  | 4.455%  | 3.628%  | 3.215%  | 2.927%  | 1.216%  | 0.514%  | 0.371%  | 0.321%  | 0.249%  |
| <b>SK</b>         | na      | na      | na      | na      | na      | na      | na      | 1.478%  | 0.441%  | 0.937%  | 1.344%  |
| <b>BG</b>         | 14.529% | 9.718%  | 1.324%  | 0.866%  | 2.787%  | 4.123%  | 6.146%  | 7.839%  | 9.305%  | 13.201% | 17.282% |
| <b>PL</b>         | 2.649%  | 3.484%  | 6.324%  | 7.408%  | 8.327%  | 14.901% | 21.345% | 27.110% | 26.164% | 26.630% | 30.913% |
| <b>HU</b>         | na      | na      | na      | na      | 1.339%  | 2.654%  | 2.894%  | 4.044%  | 7.915%  | 21.361% | 37.908% |
| <b>RO</b>         | 5.534%  | 2.801%  | 3.624%  | 11.410% | 17.461% | 17.200% | 25.781% | 28.019% | 38.294% | 48.526% | 40.364% |
| <b>SI</b>         | 0.008%  | 0.038%  | 0.046%  | 0.520%  | 0.682%  | 0.677%  | 0.729%  | 0.815%  | 3.670%  | 30.579% | 42.573% |
| <b>LT</b>         | 11.713% | 5.449%  | 10.376% | 23.980% | 40.056% | 47.302% | 35.368% | 26.259% | 36.953% | 50.643% | 49.575% |
| <b>LV</b>         | 24.323% | 42.194% | 44.107% | 45.241% | 49.566% | 46.811% | 50.071% | 56.451% | 62.774% | 69.259% | 73.486% |
| <b>EE</b>         | na      | 48.866% | 61.455% | 65.949% | 64.671% | 65.516% | 70.893% | 70.280% | 64.395% | 71.405% | 77.374% |
| <b>HR</b>         | na      | na      | na      | 88.810% | 89.118% | 89.690% | 87.908% | 83.513% | 79.063% | 79.355% | 79.203% |
| <b>Avg CEE-11</b> | 9.793%  | 14.636% | 16.464% | 27.535% | 27.722% | 29.180% | 30.235% | 27.847% | 29.941% | 37.474% | 40.934% |

Source: OeNB (2007)

The countries are tabulated in ascending order of the values of 2006 of the first table on this page.

**Foreign currency household deposits in percent of GDP nom.**

in %

|                   | 1996 | 1997   | 1998   | 1999   | 2000   | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   |
|-------------------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| <b>CZ</b>         | na   | 3.83%  | 3.74%  | 3.93%  | 3.86%  | 3.95%  | 3.25%  | 2.86%  | 2.48%  | 2.26%  | 1.92%  |
| <b>SK</b>         | na   | na     | na     | na     | na     | na     | na     | 4.70%  | 3.46%  | 2.92%  | 2.63%  |
| <b>PL</b>         | na   | 5.07%  | 4.33%  | 4.73%  | 4.57%  | 4.96%  | 4.62%  | 4.34%  | 3.36%  | 3.40%  | 3.18%  |
| <b>HU</b>         | na   | na     | na     | na     | na     | 5.08%  | 3.71%  | 3.16%  | 2.77%  | 2.95%  | 3.61%  |
| <b>EE</b>         | na   | 1.94%  | 2.37%  | 3.12%  | 3.90%  | 3.88%  | 3.36%  | 2.93%  | 2.96%  | 3.20%  | 4.04%  |
| <b>LT</b>         | na   | 2.46%  | 3.20%  | 4.73%  | 6.17%  | 6.85%  | 4.99%  | 3.83%  | 3.67%  | 4.35%  | 4.59%  |
| <b>RO</b>         | na   | 2.36%  | 2.89%  | 3.80%  | 4.02%  | 4.89%  | 4.33%  | 4.36%  | 4.24%  | 4.32%  | 4.66%  |
| <b>LV</b>         | na   | 2.66%  | 2.79%  | 3.23%  | 4.56%  | 5.58%  | 6.02%  | 6.25%  | 7.80%  | 9.48%  | 11.04% |
| <b>SI</b>         | na   | 11.98% | 11.67% | 11.60% | 13.34% | 16.59% | 15.30% | 14.56% | 15.04% | 14.60% | 14.36% |
| <b>BG</b>         | na   | 6.61%  | 6.27%  | 7.25%  | 8.53%  | 11.52% | 11.45% | 11.78% | 12.99% | 15.36% | 16.96% |
| <b>HR</b>         | na   | na     | na     | 18.03% | 19.95% | 26.16% | 24.64% | 24.75% | 26.17% | 27.45% | 27.85% |
| <b>Avg CEE-11</b> | na   | 4.61%  | 4.66%  | 6.71%  | 7.66%  | 8.95%  | 8.17%  | 7.59%  | 7.72%  | 8.21%  | 8.62%  |

Source: OeNB (2007) and IMF (2008)

**Annual growth rate of foreign currency deposits to households**

in %

|                   | 1996 | 1997   | 1998   | 1999   | 2000   | 2001   | 2002    | 2003    | 2004    | 2005   | 2006   |
|-------------------|------|--------|--------|--------|--------|--------|---------|---------|---------|--------|--------|
| <b>CZ</b>         | na   | 0.83%  | 6.65%  | 7.34%  | 7.12%  | 14.85% | -4.64%  | -11.02% | -6.59%  | 3.92%  | -3.27% |
| <b>SK</b>         | na   | na     | na     | na     | na     | na     | na      | -5.92%  | -14.73% | -4.83% | 3.93%  |
| <b>PL</b>         | na   | 1.62%  | -5.13% | 11.45% | 13.87% | 24.16% | -8.00%  | -14.19% | -17.54% | 20.79% | 3.67%  |
| <b>HU</b>         | na   | na     | na     | na     | na     | 0.78%  | -13.09% | -10.34% | -3.25%  | 14.79% | 23.19% |
| <b>EE</b>         | na   | 13.69% | 38.90% | 38.89% | 46.20% | 12.24% | -2.52%  | -4.40%  | 11.36%  | 27.49% | 49.47% |
| <b>LT</b>         | na   | 11.81% | 47.19% | 51.78% | 57.46% | 21.98% | -19.43% | -16.03% | 5.63%   | 35.08% | 21.49% |
| <b>RO</b>         | na   | 14.33% | 46.77% | 18.41% | 26.28% | 35.10% | -4.54%  | 9.22%   | 12.26%  | 30.71% | 34.26% |
| <b>LV</b>         | na   | 19.75% | 14.11% | 31.68% | 75.27% | 33.87% | 14.83%  | 4.04%   | 39.70%  | 41.56% | 44.56% |
| <b>SI</b>         | na   | 7.75%  | 4.10%  | 7.24%  | 19.19% | 30.85% | -1.30%  | -0.03%  | 9.06%   | 2.28%  | 5.84%  |
| <b>BG</b>         | na   | 16.57% | 9.35%  | 23.37% | 32.36% | 50.08% | 8.13%   | 9.89%   | 22.18%  | 29.50% | 28.11% |
| <b>HR</b>         | na   | na     | na     | 12.04% | 18.26% | 45.50% | 3.91%   | 7.61%   | 14.54%  | 14.32% | 10.39% |
| <b>Avg CEE-11</b> | na   | 10.79% | 20.24% | 22.47% | 32.89% | 26.94% | -2.67%  | -2.83%  | 6.60%   | 19.60% | 20.15% |

Source: OeNB (2007)

**Share of foreign currency in total deposits to households**

in %

|                   | 1996 | 1997   | 1998   | 1999   | 2000   | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   |
|-------------------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| <b>CZ</b>         | na   | 9.83%  | 9.55%  | 10.33% | 10.08% | 9.89%  | 8.50%  | 7.50%  | 6.60%  | 6.09%  | 5.13%  |
| <b>SK</b>         | na   | na     | na     | na     | na     | na     | na     | 14.09% | 11.69% | 10.65% | 9.23%  |
| <b>PL</b>         | na   | 22.09% | 17.11% | 18.02% | 16.19% | 16.52% | 16.60% | 16.54% | 14.19% | 14.45% | 13.38% |
| <b>HU</b>         | na   | na     | na     | na     | na     | 20.39% | 15.50% | 12.65% | 10.91% | 11.15% | 13.96% |
| <b>EE</b>         | na   | 16.93% | 20.65% | 21.77% | 23.98% | 21.66% | 18.95% | 16.59% | 15.92% | 15.40% | 17.76% |
| <b>LT</b>         | na   | 43.35% | 46.35% | 50.89% | 54.87% | 51.69% | 36.95% | 26.97% | 22.48% | 21.79% | 20.28% |
| <b>RO</b>         | na   | 22.38% | 25.56% | 34.48% | 41.49% | 46.54% | 41.51% | 44.95% | 38.55% | 35.68% | 36.15% |
| <b>LV</b>         | na   | 50.21% | 48.30% | 53.20% | 52.65% | 50.43% | 46.00% | 41.80% | 44.64% | 45.70% | 45.55% |
| <b>SI</b>         | na   | 51.16% | 45.82% | 44.04% | 44.41% | 45.34% | 41.38% | 39.53% | 38.95% | 37.95% | 37.29% |
| <b>BG</b>         | na   | 57.08% | 58.20% | 59.45% | 62.23% | 66.36% | 62.81% | 57.69% | 54.26% | 54.00% | 55.38% |
| <b>HR</b>         | na   | 83.79% | 85.83% | 95.34% | 95.40% | 95.50% | 93.70% | 93.55% | 93.04% | 92.12% | 88.09% |
| <b>Avg CEE-11</b> | na   | 39.65% | 39.71% | 43.06% | 44.59% | 42.43% | 38.19% | 33.81% | 31.93% | 31.36% | 31.11% |

Source: OeNB (2007)

The countries are tabulated in ascending order of the values of 2006 of the first table on this page.

**Consumer price index, percentage change per annum, averages**

|           | 1986  | 1987  | 1988  | 1989   | 1990   | 1991   | 1992   | 1993   | 1994   | 1995  | 1996   | 1997   | 1998  | 1999  | 2000  | 2001  | 2002  | 2003  | 2004  | 2005 | 2006 |
|-----------|-------|-------|-------|--------|--------|--------|--------|--------|--------|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|------|------|
| <b>CZ</b> | n.a.  | n.a.  | n.a.  | n.a.   | n.a.   | n.a.   | n.a.   | n.a.   | 9.87   | 9.47  | 8.82   | 8.45   | 10.68 | 2.1   | 3.93  | 4.71  | 1.79  | 0.11  | 2.83  | 1.85 | 2.54 |
| <b>SK</b> | n.a.  | n.a.  | n.a.  | n.a.   | n.a.   | n.a.   | n.a.   | n.a.   | 13.41  | 9.92  | 5.78   | 6.14   | 6.67  | 10.57 | 12.04 | 7.33  | 3.32  | 8.55  | 7.55  | 2.71 | 4.48 |
| <b>BG</b> | 2.7   | 2.73  | 2.37  | 6.39   | 23.8   | 338.45 | 91.3   | 72.88  | 96.06  | 62.05 | 121.61 | 1058.4 | 18.67 | 2.57  | 10.32 | 7.36  | 5.81  | 2.16  | 6.35  | 5.04 | 7.26 |
| <b>PL</b> | 16.55 | 26.38 | 58.72 | 244.55 | 555.38 | 76.71  | 45.33  | 36.87  | 33.25  | 28.07 | 19.82  | 15.08  | 11.73 | 7.28  | 10.06 | 5.49  | 1.9   | 0.79  | 3.58  | 2.11 | 1.11 |
| <b>HU</b> | 5.29  | 8.68  | 15.79 | 16.95  | 28.97  | 34.23  | 22.95  | 22.45  | 18.87  | 28.3  | 23.6   | 18.28  | 14.23 | 10    | 9.8   | 9.22  | 5.27  | 4.64  | 6.78  | 3.55 | 3.88 |
| <b>RO</b> | n.a.  | n.a.  | n.a.  | n.a.   | n.a.   | 230.62 | 211.21 | 255.17 | 136.76 | 32.24 | 38.83  | 154.76 | 59.1  | 45.8  | 45.67 | 34.47 | 22.54 | 15.27 | 11.88 | 8.99 | 6.58 |
| <b>SI</b> | n.a.  | n.a.  | n.a.  | n.a.   | n.a.   | n.a.   | n.a.   | 31.65  | 20.99  | 13.41 | 9.85   | 8.36   | 7.91  | 6.15  | 8.88  | 8.42  | 7.47  | 5.58  | 3.59  | 2.48 | 2.46 |
| <b>LT</b> | n.a.  | n.a.  | n.a.  | n.a.   | n.a.   | n.a.   | n.a.   | 410.24 | 72.15  | 39.66 | 24.62  | 8.88   | 5.07  | 0.75  | 1.01  | 1.3   | 0.3   | -1.18 | 1.2   | 2.66 | 3.84 |
| <b>LV</b> | n.a.  | n.a.  | n.a.  | n.a.   | n.a.   | n.a.   | 243.27 | 108.77 | 35.93  | 24.98 | 17.61  | 8.44   | 4.66  | 2.36  | 2.65  | 2.49  | 1.94  | 2.92  | 6.19  | 6.76 | 6.56 |
| <b>EE</b> | n.a.  | n.a.  | n.a.  | n.a.   | n.a.   | n.a.   | n.a.   | 89.81  | 47.65  | 28.78 | 23.05  | 10.58  | 8.21  | 3.3   | 4.03  | 5.74  | 3.57  | 1.34  | 3.05  | 4.09 | 4.43 |
| <b>HR</b> | n.a.  | n.a.  | n.a.  | n.a.   | n.a.   | n.a.   | n.a.   | 1909.9 | 107.15 | 4.04  | 4.34   | 4.13   | 6.4   | 4.01  | 4.63  | 3.76  | 1.67  | 1.77  | 2.03  | 3.34 | 3.21 |

Source: IMF (2008)

**Euro/ECU exchange rates - Annual data**

Index based on units of national currency per EUR/ECU

|           | 1996   | 1997   | 1998   | 1999   | 2000   | 2001   | 2002   | 2003   | 2004    | 2005   | 2006   |
|-----------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|
| <b>LT</b> | 100.00 | 89.31  | 88.29  | 83.96  | 72.75  | 70.53  | 68.11  | 67.98  | 67.98   | 67.98  | 67.98  |
| <b>CZ</b> | 100.00 | 104.28 | 104.62 | 107.04 | 103.31 | 98.87  | 89.40  | 92.42  | 92.55   | 86.43  | 82.25  |
| <b>SK</b> | 100.00 | 97.92  | 101.59 | 113.36 | 109.45 | 111.25 | 109.69 | 106.59 | 102.82  | 99.17  | 95.66  |
| <b>LV</b> | 100.00 | 94.25  | 94.37  | 89.42  | 79.93  | 80.06  | 83.05  | 91.58  | 95.08   | 99.51  | 99.51  |
| <b>EE</b> | 100.00 | 102.88 | 103.11 | 102.45 | 102.45 | 102.45 | 102.45 | 102.45 | 102.45  | 102.45 | 102.45 |
| <b>BG</b> |        | 100.00 | 104.13 | 103.43 | 103.24 | 103.03 | 103.08 | 103.07 | 103.30  | 103.43 | 103.43 |
| <b>HR</b> | 100.00 | 102.28 | 104.90 | 111.41 | 112.17 | 109.78 | 108.84 | 111.15 | 110.14  | 108.74 | 107.60 |
| <b>PL</b> | 100.00 | 108.57 | 114.44 | 123.52 | 117.12 | 107.30 | 112.71 | 128.56 | 132.27  | 117.55 | 113.84 |
| <b>HU</b> | 100.00 | 109.24 | 124.16 | 130.46 | 134.21 | 132.43 | 125.39 | 130.90 | 129.88  | 128.02 | 136.39 |
| <b>SI</b> | 100.00 | 106.42 | 109.89 | 114.23 | 120.96 | 128.13 | 133.46 | 137.87 | 140.91  | 141.37 | 141.35 |
| <b>RO</b> | 100.00 | 209.45 | 258.59 | 421.85 | 516.60 | 673.77 | 809.11 | 972.22 | 1049.27 | 938.00 | 912.40 |

Source: Eurostat (2007) and National banks (2007)