An Overinvestment Cycle in Central and Eastern Europe?

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Summary

Prior to the Asian crisis, easy liquidity conditions contributed to credit expansion and overinvestment in the East Asian economies until they were hit by a deep recession. Similarly to the developments in the tiger economies in the nineties, CEE grew rapidly from 2001 to 2007, due to foreign capital inflows. But the current global financial turmoil and economic downswing pulled the CEE economies into the maelstrom of the crisis. With the Asian experience in mind, the aim of this paper is to analyze whether overinvestment due to easy liquidity conditions possibly emerged and contributed to the crisis in CEE.

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1   Introduction

Prior to the Asian crisis of 1997/98, easy world liquidity conditions contributed to credit expansion and *overinvestment*[2] in the East Asian economies until they were hit by a deep recession that revealed unsustainable investment projects (Saxena and Wong 2002). Similarly to the tiger economies in the 90s, the Central and Eastern European (CEE[3]) economies grew rapidly from 2001 to 2007. But the current global financial turmoil and economic downswing pulled the CEE economies into the maelstrom of the crisis. With the East Asian experience in mind, the main aim of this paper is to analyze whether easy outside (EMU) liquidity conditions possibly triggered a credit-induced overinvestment boom that culminated in the current crisis in CEE.

Thus far a substantial number of papers focus on identifying how sudden liquidity shocks affect inflation and growth in small open economies. Therefore, several variations of Sims (1980)'s VAR methodology are applied throughout the literature (e.g. Mojon and Peersman 2003, Canova 2005 and Schneider and Fenz 2008). For CEE, for instance Arnostova and Hurnik (2004) find that changes in EMU liquidity conditions affect inflation in the Czech Republic. And Kuijs (2002) finds a quick response towards EMU liquidity shocks on prices in Slovakia.

Although previous research shows that liquidity shocks affect inflation and growth in CEE, it does not come up with an explanation of how easy liquidity conditions can build up a crisis potential during the boom period. To explain the emergence of a crisis, most current research assumes that an exogenous shock changes aggregate supply, demand or liquidity conditions. Then, the rational and fully informed agents adjust to the new situation. The

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[2] Mal- or overinvestment labels investment projects that seem to pay-off (due to ignoring risks or excessive lending), but eventually do not pay-off.
[3] In this paper the new member states of the European Union, except of Cyprus and Malta, are denoted as CEE.

assumption of price stickiness allows for an adjustment period that is interpreted as a business cycle (De Grauwe 2008, Lombari and Sgherri 2007).

In contrast, Hayek (1929) and Mises (1912) argue that exuberated credit growth causes an overinvestment boom that endogenously leads to a bust (in a closed economy). The central bank provides easy liquidity conditions. This allows the banking sector to hold interest rates artificially low, which induces a credit boom that is unsustainable in the long-run. Also Akerlof and Shiller (2009), Shiller (2000), De Grauwe (2008) and Minsky (1986) explain the bust endogenous to the boom. However, contrary to the Mises-Hayek overinvestment theory, they emphasize the need for "animal spirits", herding or self-fulfilling prophecies (instead of easy liquidity conditions) for the emergence of the boom-and-bust cycle.

Robbins (1934) most prominently applies the Mises-Hayek theory to explain the causes of the Great Depression. Building upon this, Eichengreen and Mitchener (2003) use quantitative tools to find evidence of whether a credit boom contributed to the Great Depression, approving the main arguments of the credit boom theories. For (small) open economies, White (2006) argues that the Mises-Hayek credit boom explanation of the business cycle may even be more applicable, as capital in- and outflows can bring about booms driven by foreign credit.

Also, McKinnon and Pill (1997) explain that buoyant foreign borrowing may cause overinvestment in small open economies. Certainly without reference to the Mises-Hayek theory, Krugman (1998a) and Corsetti et al. (1999) find overinvestment and over-borrowing (due to moral hazard of banks) to be causes of the Asian crisis. And more recently, Schnabl and Hoffmann (2008) and McKinnon and Schnabl (2009a) argue that easy liquidity conditions after 2001 contributed to investment booms around the world, especially in small open economies.

To analyze whether easy (EMU) liquidity conditions triggered a credit-induced boom-and-bust cycle in CEE, the paper starts with an introduction of the overinvestment theory of

Mises (1912) and Hayek (1929) that explains how overinvestment can emerge due to buoyant credit expansion (section 2). Then, augmenting the overinvestment theory to a small open economy framework shall help with understanding possible causes of buoyant credit growth and overinvestment in the small open economies of CEE. Section 4 provides an analysis of whether easy EMU liquidity conditions transferred to CEE and possibly caused a credit boom that culminated in the current crises. Section 5 concludes.

2 Overinvestment in closed economies

This section discusses the overinvestment theory of Ludwig von Mises (1912) and Friedrich August von Hayek (1929, 1935). The theory may provide an explanation for the emergence of overinvestment and crisis due to positive expectations and easy liquidity conditions in a closed (advanced) economy framework.

2.1 The Mises-Hayek overinvestment theory

Interest rate concept

In the Mises-Hayek theory the interest rate coordinates the spending plans of investors and households over time. When households save more today and provide capital to the investors, they want to consume more in later periods. Thus, investment activity goes along with saving activity to provide the goods needed in the future. Following Wicksell (1898), Mises (1912) and Hayek (1929, 1935) the rate that balances savings and investment is called "natural rate of interest". This rate provides the savers with the revenue that allows them to consume the output that is additionally produced in the future due to their willingness to forgo

consumption. Thus, to keep the economy in equilibrium, banks have to set money market rates according to the natural rate.

Monetary causes of an overinvestment boom

According to Hayek (1929), an overinvestment boom may start with a rise in profitability of investment projects and positive expectations about the future income. Hayek (1929) follows Schumpeter's concept of "new combinations" (i.e. innovations) as a possible cause of positive expectations (Hayek, 1929 [1976]: 95; Schumpeter 1912: 100-103). According to Schumpeter, an innovation is the result of competition, where "dynamic entrepreneurs" try to create an advantage over the other market participants to achieve higher profits. Other market participants soon realize the gains from this innovation and want to adopt it. (Schumpeter 1928: 36).

This brings about a higher demand for capital. With capital demand (investment) increasing, the "natural rate of interest" rises, because capital supply and saving preferences remain constant. Thus, to keep savings and investment in equilibrium, banks have to increase the money market rate in this situation. However, Hayek and Mises argue that banks have the tendency to expand credit too far at unchanged rates, due to competition for the greatest market share (Mises 1912: 409, 417, 420, 428, 430; Hayek 1976 [1929]: 99).[4] This is often referred to as the *"perverse elasticity of the banking sector."*

Theoretically, the central bank can restrict this credit expansion by constraining the liquidity conditions of the banks. Central banks may do this e.g. by increasing the refinancing costs or minimum reserve requirements for banks. This would force the banks to increase the money market rate which increases the cost of credit for investment projects in accordance to the higher demand and makes savings more attractive. On this way the economy would soon

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[4] Rotemberg and Saloner (1987) found that oligopolistic competition provides incentives to not adjust prices straight away and may provide a theoretical model for this behavior. Further Carilli and Dempster (2001) use a prisoner's dilemma framework to explain the profit maximizing behavior of investors and banks.

be in equilibrium again. However, this is unlikely to happen. Therefore banks can widely expand credit in accordance to the rise in demand at unchanged rates (Hayek 1976 [1929]: 99-103; Mises 1912: 417-430).

Instead of constraining the banks and smoothening the credit cycle, central banks often see expansionary monetary policies as tools to promote economic growth. This point is stressed by Mises (1928, 1966) as well as by Hayek (1935). Hayek (1935) does not see the initial causes of the credit boom in innovations and expectations, but rather in an expansionary monetary policy that induces banks to lower money market rates. As the money market rate does not decline due to additional savings, it falls below the natural rate of interest. Further, the drop in money market rates induced by the central bank makes savings less attractive. On the other hand, investment projects that would not be lucrative under equilibrium interest rates become profitable. With more investment, employment and incomes increase; and consumption booms (Mises 1912; Hayek 1929; Hayek 1935).

Changes in the production structure[5]

While Hayek (1929) and Mises (1912) elaborate on the monetary causes of overinvestment cycles, Hayek (1935) further explains the real consequences of a credit expansion (Hayek 1967 [1935]: VIII). Building upon Böhm-Bawerk's capital theory (1884, 1923), Hayek argues that the drop in money market rates changes the production structure in the economy. A lower money market rate brings about more "roundabout ways of production" as the production of capital goods becomes relatively lucrative (Böhm-Bawerk 1884: 400). This means that credit and resources are allocated towards the production of intermediate (capital) goods that cannot be consumed right away as investors assume that households save more and forgo consumption. These goods are used to produce consumption goods at a later stage of production. The investment boost brings about more employment and rising incomes.

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[5] Kirzner et al. (1995) provides an interesting discussion of Hayek (1935)'s *Prices and Production*.

When all factors are employed, resources from the consumption sector are shifted towards the capital goods sector.

However, as this shift is caused by expansionary monetary policy instead of voluntary savings, savings did not increase and consumption activity is not reduced (Hayek 1967 [1935]: 87-88). When the amount of produced consumer goods remains constant or falls and the incomes of the consumers increase in the face of even higher consumption preferences, prices of consumer goods must increase (Hayek 1967 [1935]: 57; Mises 1912: 430, 431). This inflationary pressure is equivalent to forced savings (Hayek 1935) or wealth redistribution from workers (who intended to save a small amount of their income) towards investors (who save more) (Mises 1967, Sraffa 1932a, Garrison 2004) and cause the turn-around. The boom is characterized by overinvestment and overconsumption (Garrison 2006: 72).

The turn-around and crisis

Rising consumer prices signal that the production of consumer goods becomes relatively more lucrative. When the demand for consumption is too "urgent" to further invest in capital goods, resources have to be reallocated towards the production of consumer goods. Then previous investment plans become unprofitable. The central bank contributes to this shift by constraining credit expansions to counteract the inflationary tendencies (Hayek 1967 [1935]: 90). Then the crisis is inevitable.

During the crisis the banking sector reconsiders credit lines (Hayek 1976 [1929]: 101). As the rising money market rate lifts the threshold for the profitability of all previous investment projects, this dismantles investment projects (especially investment in capital goods) with an internal interest rate below the risen money market rate. At this time production capacities become useless. Plants and durable goods may only be sold with losses and become unprofitable (Hayek 1967 [1935]: 96). Overinvestment dismantles. Previous overconsumption turns into abstinence of consumption as the losses due to mal-investment

have to be digested. A recession follows which will be the deeper the larger the "exuberance" has been.

As overinvestment is dismantled, other investment projects may become unprofitable as general demand declines (negative multiplication effect). Thus the natural interest rate starts to fall. At the same time banks suffer from credit defaults due to malinvestment. Credit supply is constrained and rates for new investment projects are high. In this situation the money market rate is above the natural rate. This aggravates the downturn.

Policy implications

"In times of crisis central banks should give increased accommodation and extend thereby their circulation in order to prevent panics" (Hayek 1967 [1935]: 109). Thus, lowering the money market rate in accordance with the natural rate is necessary to beware the economy of serious disturbances and counteract a secondary deflation. However, further expansionary monetary or fiscal policies are not seen as useful tools to accelerate the recovery of the economy.

Instead, Mises and Hayek argue that the structural adjustment after the turnaround is a necessary prerequisite for the next boom after the slump. The *"crisis will heal the market"* (Mises 1912: 431) as it separates profitable investment projects (with high internal interest rates) from investment projects with low profitability (low internal interest rates). In a crisis, market participants restore the disequilibrating effects of an expansionary credit policy to equilibrium. This implies the existence of an internal impulse towards equilibrium (Rizzo 1990). Without such a cumbersome process, investment projects with low internal interest rate would be maintained, the necessary restructuring would be postponed, and the following upswing would not be sustainable.

The general policy implication for central banks is to hold market rates close to the "natural rate of interest" and closely watch the liquidity conditions of the banking sector to

safeguard the economy against volatility and severe crisis. The longer market and natural rates differ, the bigger the catastrophe (Mises 1912: 436).

2.2 Applicability of the theory

Critical assessment of the theory

Keynes and Sraffa most prominently criticized the Mises-Hayek business cycle theory. According to Keynes a policy induced monetary expansion does not necessarily go along with more investment; instead additional money could be used to digest losses. Further he claims that investment and saving activity may also diverge without changes in the interest rate, f.i. due to changes in investment rates or liquidity preferences (Kirzner et al. 1995: 92).

Sraffa (1932a) criticizes the theory of not being consistent in itself. The turn-around due to forced savings (theft) or inflation is not consistent with Hayek's idea of a return to equilibrium as it causes a lack of consumption. Further, Hayek's assumptions are too strong, as he abstracts from debts, contracts, wage and price rigidities. In general Sraffa finds the Austrian capital theory to be wrong and misleading (Kirzner et al. 1995: 96; Sraffa 1932b: 45).[6]

Not only Hayek's opponents criticized the theory. For instance, Hawtrey (1932: 125) and Kaldor (1942: 359) explain that introducing the capital theory and changes in the production structure rather weakened the Mises-Hayek theory of the business cycle. Further Lachmann (1940: 180-181) argues that Hayek (1935) puts too much emphasis on the changes in the production structure. Also, the assumption of full employment in the boom is counterfactual to reality. According to him, expectations play a major role in business cycle theory as outlined by Schumpeter's (1939) "Business Cycles" (Lachmann 1940: 180; 1943).[7]

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[6] Heinz Kurz explains the Keynes/Sraffa – Hayek controversy in more detail (In Kirzner et al. 1995, 89-105).
[7] There are several other critics of the theory, e.g. by Friedman (1969) and Krugman (1998b). They consider the theory to be wrong.

Applicability

The critics weaken the applicability of the theory as they show that the mechanisms that lead to boom-and-bust cycles, as described by Mises and Hayek, may not always be the similar. Therefore different crises may have different explanations. Especially, Hayek's (1935) capital theoretic explanation of the turn-around and bust seems to be problematic. Therefore, newer research that builds upon Mises and Hayek complements (Cowen 1997; Garrison 2006) the capital theory with the idea of marginal investment projects and different risk levels of investment to improve its applicability. Accordingly, policy can induce credit expansion that allow for riskier projects to be undertaken (Garrison 2006: 107-122).

Despite the critics, the theory seems to be applicable in many instances.[8] Eichengreen and Mitchener (2003) finds that the "credit boom theories" of the business cycle have explanatory power for the emergence of the Great Depression. Also Oppers (2002) argues that there are still lessons to be drawn by the Mises-Hayek theory as the crises in Japan in the 1980s and 90s as well as the dot-com bubble include some features similar to their theory. And according to White (2006), in small open economies capital in- and outflows increase the likelihood of Mises-Hayek credit cycles.

Most recently the emergence of the US housing bubble and its later corrections are reminiscent of the monetary theories of Hayek (1929) and Mises (1912). Taylor (2008) and Diamond and Rayan (2009) explain that the primary cause of the boom in the housing market was accommodative monetary policy of the Federal Reserve. Acemoglu's (2009: 190) explains that the loss of GDP was probably *"unavoidable anyway, given the overexpansion of the economy in prior years."* But the economy returns to equilibrium as *"within a decade or two, we may see modest but cumulative economic growth that more than outweighs the*

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[8] Countries that see large capital inflows and current account deficits like emerging Europe, Spain and the US see both overinvestment and over-consumption in the boom. On the other hand, in countries like Germany, f.i. (car industry) malinvestment and (domestic) under-consumption may provide a better explanation of the crisis. Therefore polcy implications may differ.

current economic contraction." Therefore Acemoglu (2009) draws similar lessons for policy as Mises and Hayek. He explains that *"the preoccupation of economic theory with economic growth offers a cautionary note against overreacting to the crisis."*

3   Overinvestment in small open economies

Mises and Hayek explain the causes of overinvestment in a closed (advanced) economy framework. They stress that it is the fall of the money market rate below the natural rate that causes the cycle. In this part the theory is augmented to small open economies by introducing more recent research to help with explaining the causes of buoyant credit growth and overinvestment in a small open (emerging market) economies.

3.1   Foreign credit and overinvestment

Foreign credit and growth

With closed capital markets, entrepreneurs can only raise money from domestic banks. In this context underdeveloped financial markets in emerging market economies are by definition characterized by high interest rates and risk (*original sin)* (Eichengreen and Hausmann 1999). Therefore the expected return of planned investment projects has to be high to be realized. According to overinvestment theories of Mises and Hayek the investment activity is sluggish in this scenario.[9]

Free access to international capital markets lowers money market rates and thereby accelerates investment and growth (McKinnon 1997). In this scenario, lower interest rates

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[9] The CEE economies faced an even greater problem. They had no market economy, needed to accumulate capital (Böhm-Bawerk 1884).

from abroad can boost investment. Low world interest rates promote investment in the domestic market because they are tantamount to lower costs of investment, as investors can use foreign savings to finance projects in the domestic market. Due to capital inflows the interest rate level converges towards the international level (plus a risk premium).[10] According to Mises and Hayek this drop in interest rates must initiate an upswing.

Figure 1 explains the effects of opening capital markets for instance for the CEE economies. It shows that after opening capital markets world liquidity conditions, especially EMU interest rates, affect investment decisions in CEE. When borrowing from abroad capital supply in CEE increases as foreign savings become available via capital imports. On the other hand, as the CEEC are relatively small, they do not affect capital supply in the EMU. Thus, capital inflows lower interest rates in CEE. Investment projects in CEE can be financed with capital at the cost of i_{mEU} (plus a risk premium). The investment activity increases. The catch-up process starts.

[Figure 1]

This is equivalent to a drop of interest rates in the closed economy framework of Hayek and Mises, which allows for additional investment especially in investment goods. Similarly to a credit expansion of banks in a closed economy, the interest rate drop will bring about lower saving preferences and higher consumption preferences of households. As in a small open economy where goods are available via imports, the current account balance turns negative. In this case, households borrow against future income (McKinnon and Pill 1997). But because the capital stock of economies in the catch-up process grows, the marginal rate of capital declines and the economic growth rates converge towards the level of the advanced economy. Thus the natural rate declines as well.

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[10] This is only true, if return on investment are higher. Capital market imperfections and high risks of investment may hinder capital mobility and even reverse capital flows (Lucas 1990).

Due to higher production and income, investors are able to repay foreign credit lines in the future unless malinvestment is made. Thus, the short-term drop in savings is not troublesome. The current account deficit rather reflects an intertemporally efficient allocation of resources (McKinnon and Pill 1997), bringing about higher production, wages and savings in later periods. Hence, free access to international capital markets increases investment and growth.

Foreign credit and overinvestment

Overinvestment in a small open economy is likely to emerge if world interest rates are "too low" (below their natural rate). Central banks in advanced economies may contribute to this by holding interest rates too low. Further, the credit creation of banks which is widely independent from the money supply of central banks may cause excessive liquidity conditions. Then capital flows can transfer easy world liquidity conditions to a small open economy, e.g. via foreign credit. This may bring about boom-and-bust cycles along the long-term growth path (Schnabl and Hoffmann 2008) as outlined by Mises and Hayek for a closed economy.

Overinvestment driven by buoyant capital inflows is most likely in the presence of positive expectations about the future returns from investment (high expected internal interest rates) in the small open economy. In this situation the volatility risk of the small economy is often neglected and banks finance riskier investment projects (Saxena and Wong 2002; Cowen 1997). Further, moral hazard (e.g. guarantees by central banks) may signal lenders too high pay-offs and lead them to finance additional investment projects (McKinnon and Pill 1997; Corsetti et al. 1999; Garrison 2006: 121). This causes over-borrowing of households and investors, increases consumption and decreases savings below a point that is sustainable. Then the economy faces overinvestment, overconsumption and unsustainable current account deficits (McKinnon and Pill 1997).

Some evidence

For instance in the 1990s, over-optimism about the future growth-path and false fiscal policy were incentives for neglecting the volatility risk and for rising credit demand in the small open economies of East Asia. The availability of cheap U.S. and Asian monies allowed for exuberate credit growth and over-borrowing (Saxena and Wong 2002). In the mean time, central banks implicitly guaranteed the banks to act as a lender of last resort in case of default and crisis. Therefore banks ignored risks of default because they believed that possible losses would be covered by an insurance system (Krugman 1998a, Corsetti et al. 1999). Thus, an artificially lowered risk premium further reduced the costs of capital for investors, and capital investment, especially in real estate and construction, boomed. Overinvestment emerged.[11] This is in line with the augmented Mises-Hayek explanation. Here, risk-taking contributed to more investment, especially in capital goods.

Similarly, the Federal Reserve provided low cost liquidity as it kept interest rates *"too low for too long"* after the burst of the dot-com bubble in 2001, contributing to excessive borrowing and the US housing market bubble (Taylor 2008, Lombari and Sgherri 2007, Diamond and Rajan 2009). The Fed's overreaction accompanied by loose regulation further led to dollar *carry trades* to markets around the world, especially in 2005 and 2006 (McKinnon and Schnabl 2009a) and translated to monetary expansion worldwide. Especially countries that pegged their currencies to the dollar experienced foreign reserve growth, and thus monetary expansion. But also the ECB that tried to prevent the euro from appreciating too much, reluctantly followed the US monetary expansion until 2006 (Belke and Polleit 2006; Hoffmann 2009).

Additionally, new unregulated financial products (derivatives) seemed to allow for unlimited credit creation at unchanged rates as banks could pass on the risks of investment via

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[11] This is caused by "too big to fail" policies of central banks in case of default Other implicit insurance systems are IMF bail-outs.

AAA rated derivatives to investors worldwide (Diamond and Rajan 2009). Thus, the investment activity further increased. In the Mises-Hayek theory this lifted the natural rate above the respective money market rate and can be interpreted as signs of the *"perverse elasticity of the banking sector."* With central banks losing control over liquidity conditions, global excess liquidity after 2001 led to credit growth, inflation and real estate booms in several markets (Belke et al. 2008). This contributed to hiking asset prices around the world (Borio 2008), in particular in new and emerging markets as additional liquidity is likely to *"vagabond"* to the high-yielding markets (Schnabl and Hoffmann 2008).

3.2   Exchange rate regime and overinvestment

The emergence of overinvestment due to capital inflows in a small open economy largely depends on its exchange rate regime. Under both, fixed and flexible, exchange rate regimes, overinvestment cycles can emerge, although causes and transmission differ.

Fixed exchange rates may attract capital inflows as the exchange rate risk seems to diminish (Fischer 2001). If this risk is not taken into account, foreign investment and borrowing only depend on the interest rate differential with the anchor economy. Speculative capital flows to countries with fixed exchange rates should increase their exchange reserves as well as stock and real estate prices. Overinvestment may also emerge if banks borrow money denominated in foreign currency to give it to the domestic investors, without consideration of the exchange rate risk. According to Herzberg and Watson (2007) hard pegs *"accelerate the expansion of un-hedged borrowing in foreign currencies."* Thus, banks have incentives to expand credit lines too far as in the closed economy framework of Mises and Hayek. Maturity mismatches enhance the danger of a crisis due to overinvestment.[12]

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[12] This was the case in the run-up to the Asian crisis.

Further, in currency board arrangements, monetary expansions of the anchor economy directly transfer into monetary expansions in the anchoring economy. Therefore, an asymmetric shock in an anchor economy can bring about an overinvestment boom in small open economies with a currency board. If the small open economy is in a boom and the anchor economy experiences a cyclical downturn, the optimal money market rate (natural rate) in the small economy is higher than in the anchor economy. This can fuel the boom in the small economy and bring about investment that only pays-off until interest rates in the anchor economy start to increase. But if business cycles are highly synchronized, as in the case of CEE and the euro area (Fidrmuc and Korhonen 2006), this scenario is rather unlikely.

On the other hand, flexible exchange rates can induce speculative investment due to "one-way bets" on appreciation, especially in economies that are in the process of catching-up (McKinnon and Schnabl 2009b). "One-way bets" on appreciation may then endanger price stability in volatile small open economies (Merza 2004). Furthermore, if banks anticipate that the domestic currency appreciates due to the Balassa-Samuelson effect, they may borrow at low interest rates in the currency of the anchor economy and convert this money into domestic currency. When the domestic currency appreciates, the value of foreign liabilities declines (in terms of domestic currency). In this situation, the central bank faces the revaluation loss and allows for more speculative investment and consumption of the private sector (Schnabl 2008a). Herding behavior can make appreciation expectations reinforcing and bring about a highly overvalued currency (Schnabl 2008a).[13]

In both exchange rate strategies, the volatility of the economy increases with the amount of capital attracted. Therefore most emerging market economies intervene in the foreign exchange market and accumulate reserves to safeguard the economic stability, even though they announce the exchange rates to be flexible (Schnabl 2008a). When reserves are accumulated, capital inflows translate into additional monetary expansions. Thus, the money

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[13] In periods of contraction this effect is well-known. During the Asian crisis 1997/98 investors expected a strong depreciation and withdrew capital.

market rates fall below the natural rate. Following Hayek and Mises the monetary expansion eases credit conditions for the banking sector and translates into additional credit to the private sector, due to the competition among banks. The credit boom is characterized by falling interest rates and a rising number of low-yielding investment projects.

In both cases imports increase relative to export. On the one hand, exuberate capital inflows to economies that peg their currency to an advanced economy translate into higher wages and inflation (Schnabl and Ziegler 2008), improving the purchasing power of consumers in the small open economy. On the other hand, under a flexible exchange rate regime, the purchasing power increases relatively as the domestic currency appreciates. Both transmission channels lead to an appreciation of real exchange rates (De Grauwe and Schnabl 2005). As in the theory of Hayek and Mises, savings are unlikely to increase with declining interest rates. Therefore the wealth effect from overinvestment contributes to higher consumption and increases imports as they become relatively cheaper. Thus, in both cases, imports tend to increase relative to exports due to the capital inflows into the economy. Overinvestment is followed by overconsumption. Thus, overinvestment cycles can emerge under either exchange rate regime.[14]

4   Easy liquidity and overinvestment in CEE

In this section, an empirical analysis shall provide evidence of whether easy liquidity conditions in the EMU affected liquidity conditions in CEE as suggested in section 3. Furthermore, it is elaborated, whether a credit-induced overinvestment boom possibly emerged in CEE (in the sense of the augmented Mises-Hayek theory).

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[14] Empirically the transmission over fixed exchange rates is more pronounced.

4.1   Impact of easy EMU liquidity conditions on CEE

Foreign capital inflows and liquidity conditions in CEE

After the burst of the dot-com bubble capital flows to CEE increased due to two reasons: First, positive growth expectations attracted FDI as well as portfolio investment from international investors financed at the cost of low world interest rates. Second, as most banks in CEE are foreign owned, they were considered to be safe lenders. For instance in Estonia, Swedish banks dominate the banking sector. Similarly, Austrian banks play a significant role in Hungary. This domination of western subsidiaries and foreign owned banks raised the credibility of the financial sector and allowed for an easy access to international capital (Ehrlich et al. 2002, Sepp and Randveer 2002). Both, FDI and foreign owned banks seemed to provide an insurance against financial instability.

Foreign borrowing of banks increased in CEE, because the interest rate spread between the euro area and CEE was high (Figure 2 and 3). This was especially the case after 2002 when world interest rates were abnormally low (Taylor 2008, Lombari and Sgherri 2007) and CEE improved its macroeconomic stability as a prerequisite for EU accession. Foreign borrowing brought about falling lending rates and a dependency on foreign credit. The banking sector passed on the currency risk from borrowing in euro to the private sector. The capital inflows squeezed the spread between deposit and lending rates in CEE close to the spread in the euro area (Figure 4). This provided an incentive to take higher risks to both borrowers and lenders.

Although the exchange rate risk adds to the risk premium, the falling lending-loan rate spreads (that can be seen as measures of risk) reflect that investors neglected this risk as EU membership and guaranteed euro adoption seemed to make depreciations unlikely (Figure 4). The exclusion of the risk further lowered loan rates. Therefore, especially in countries with exchange rate pegs, interest rates converged towards the EMU level (Figure 2) In Estonia the

interest rate differential to the euro area was close to zero after 2004. In Poland the differential disappeared after joining the EU. The increases of the share of banks' foreign liabilities after 2003 reflect this interest rate convergence (Figure 3). This provides evidence of a transmission of EMU liquidity conditions and interest rates to the small open economies in CEE.

[Figure 2] [Figure 3] [Figure 4]

Transmission of easy liquidity conditions in the EMU to CEE

Granger causality tests can help with finding evidence of a transmission of easy liquidity conditions from the EMU to CEE (Granger 1969). Following the augmented overinvestment framework, easy liquidity conditions are a deviation of the real money market rate from the natural rate. Therefore, the null hypothesis of the Granger causality test is that the deviation of the real money market rate from the natural rate in the EMU *does not Granger Cause* the deviation in the NMS. If the test rejects the null, this provides evidence of a transmission of easy liquidity conditions. The Schwartz criterion is used to select the correct lag length for the Granger causality test.

For the analysis, monthly data is taken from the International Financial Statistics of the IMF provided by the Reuters EcoWin database. The data set starts in 1998 as before data (government bond yields) is hardly available. However, for most countries the data set even starts only in 2002. This is sufficient for our test as the transmission of easy money from the EMU to CEE is argued to have started in the aftermath of the bursting internet bubble and accelerated when the countries joined the EU. The data includes money market rates, long-term interest rates and consumer price inflation for the NMS and the EMU, respectively. The real money market rate is calculated by subtracting consumer price inflation from the money market rate for each economy.

The calculation of the natural rate can be troublesome. Woodford (2000) defines Wicksell's natural rate to be the real interest rate that yields price stability. Following Williams (2003) the natural interest rate can be approximated by the average long-run real interest rate if inflation and time preference are more or less stable. This rate then largely depends on the trend of the real growth of an economy. However, then the natural rate would be a constant. To allow for structural changes (in time preferences, trend growth), which can have an impact on the natural rate of interest, I construct a natural rate following Keeler (2001) and Mulligan (2002; 2006) who consider that the observed long-term rate (government bond yield) is a good proxy for the natural interest rate.

Thus the natural rate is equal to a weighted average of short-term rates plus a risk premium. Easy liquidity conditions should then increase the *gap* between long-term and short-term interest rates in the period from 2002 to 2006 as a monetary expansion or more risk-taking lowers short-term rates. Long-term rates, on the contrary do not directly go along with the cycle (Keeler 2001). The *gap* opens at the beginning of the credit boom. When the gap closes and becomes negative, we see a recession. At the 10 percent significance level, the Dickey-Fuller test does not identify unit roots in the calculated *gaps*.

The Granger causality test widely approves that the *gap* in the EMU *Granger causes* the gaps in the CEE economies for this sample (Table 1). Only for Estonia and Slovenia, the causality must be rejected. This is surprising, as both economies have stable exchange rates to the euro since 2004. Slovenia introduced the euro in 2007. Thus the countries directly follow possible monetary expansions in the euro area. Further, in two cases (Hungary and Czech Republic) the causality seems to be two-sided.

[Table 1]

When adjusting the sample to the most interesting period from 2002 to 2007, also the Slovenian and Estonian gaps are Granger caused by the *gaps* in the EMU. Therefore easy liquidity conditions from the EMU, as defined here, transferred to the CEE economies. Further, Table 2 provides more evidence of the direction of liquidity transmission. The money market rates in all new member states, except of Romania, are *Granger caused* by the EMU rates. For some countries this is only true after 2001, as they pegged their currencies to a currency basket beforehand.

[Table 2]

4.2   Possible signs of an overinvestment cycle

The credit boom?

Capital inflows and increased foreign borrowing of banks went along with high growth in output and credit. They were reflected by large current account deficits, especially in the economies with exchange rate pegs, as higher incomes were spent on foreign goods. Figure 5 shows that in the CEE economies credit to the private sector as share of all assets has increased strongly after 2002. Similarly, credit to the private sector as percent of GDP increased especially in countries with pegs to the euro. Further, the credit-deposit ratios of banks in 2007 are high above their past averages, especially in the Baltics, Romania and Bulgaria (Figure 6). This indicator can be seen as a financial deepening indicator but also as a sign of more risk-taking by banks (Beck et al. 2000).

[Figure 5] [Figure 6]

Following the augmented overinvestment framework, these are the typical ingredients of a credit-induced overinvestment boom. Accordingly, a substantial number of studies stressed the danger of excessive credit growth, current account deficits and overheating for stability in the CEEC prior to the current crisis. (Egert and Backe 2006, Sopanha 2006, Duenwald et al. 2005, Mendoza and Terrones 2004, Hoffmann and Schnabl 2007, Bini-Smaghi 2007, Schnabl 2008b).

However, there is a broad consensus that credit booms are hard to spot before the event of the crisis, because high growth rates of output and credit to the private sector may also be justified by financial deepening (Beck et al. 2000), new technology, institutional change (as explained by Hayek and Schumpeter) or - as in the case of CEE - the accession to the EU and the expectation of euro adoption. Thus, large credit growth itself does not provide *ex ante* evidence of a credit boom (Eichengreen and Mitchener 2003, 15), even though loose credit conditions and credit growth are prerequisites of a credit boom. Eichengreen and Mitchener (2003) use three measures for an *ex post* quantitative analysis of whether an overinvestment may have occurred prior to the Great Depression: 1. the development of asset prices, 2. the investment/GDP, and 3. the money/GDP ratio. These indicators are analyzed in the following:

First, Figure 7 shows that share prices (broad index from the IMF statistics) increased in all CEE economies especially after 2001 when credit growth increased and interest rates were low. In Figure 7 the development in Poland, Estonia and Romania is shown as representatives for the different exchange rate strategies. Since 2007 share prices have been falling sharply. The share price index follows the Eichengreen-Mitchener scheme for a credit boom.

[Figure 7]

Second, the development of the investment/GDP ratio is illustrated in Figure 8 using data of quarterly capital formation. It indicates an increase of this ratio up to 2007 in Romania and Estonia, representing the countries with rather fixed or pegged exchange rates. In countries with flexible exchange rates such as Poland this cannot be found, even though the investment/GDP share increased after 2004 in accordance with the interest rate convergence. Hungary, which is not in the graphs, is an exception. Troubled by instability the investment/GDP ratio did not increase, although share prices in Hungary have a similar trend to those in the other CEE economies. As increases in credit and investment were most pronounced among countries with tight pegs to the euro, e.g. the Baltic States, Bulgaria and Slovenia, exchange rate pegs contributed to higher investment and growth rates in CEE countries from 1994 to 2007 (Hoffmann and Schnabl 2009, Schnabl 2008b).

Interestingly, as explained by Hayek (1935) additional investment went along with an increase in construction and a boom in the real estate sector in most CEE economies. Further the production of capital goods increased relatively to the production of consumer goods. This may signal a change in the production structure caused by easy credit conditions as explained by the overinvestment theories (see Figure 9). Due to the prior increase, also the fall in the production of capital goods in the crisis is more pronounced.

[Figure 8] [Figure 9]

Following Eichengreen and Mitchener (2003) a rising money/GDP ratio is the third indicator for an overinvestment boom in the sense of the Mises-Hayek theory. Figure 10 illustrated that the money/GDP share increased in all CEE economies during the boom. Especially from 2003-2007 the money/GDP share grew rapidly as capital inflows caused a fast accumulation of reserves in all CEE economies (that translated into additional monetary expansions). Figure 11 shows that countries with more flexible exchange rates did not stay behind

exchange rate stabilizers in accumulating reserves. Countries with *de jure* intermediate exchange rate regimes like Romania and Slovakia even experienced the fastest reserve accumulation. In accordance with the reserve accumulation, real appreciation accelerated in all new member states. Figure 12 indicates that there was no difference between the countries with flexible and fixed exchange rates. Although nominally the exchange rate was stable, for instance in Estonia, capital inflows led to wage and (asset) price increases, which appreciated the currency in real terms during the boom period.

[Figure 10] [Figure 11] [Figure 12]

The construction of a composite indicator of the three credit boom indicators may provide evidence of an interrelation of the credit boom indicators (Eichengreen and Mitchener 2003; Borio and Lowe 2002). Therefore the deviation of the money/GDP and investment/GDP ratios as well as of the development of share prices (growth) from their HP trend are added with equal weights for the average share prices growth, money/GDP and investment/GDP ratios in CEE. Figure 13 indicates that after 2005, the composite indicator signals a credit boom. Figure 14 shows the development of each indicator separately. As share prices seem to fluctuate heavily, even though they provide the same notion, the composite indicator without shares is constructed as well. The indicator widely remains unchanged. This provides *ex post* evidence in favor of the strand of literature that warned from overheating pressure in CEE due to credit booms since 2005, such as Egert and Backe (2006), Sopanha (2006), Duenwald et al. (2005), Mendoza and Terrones (2004) and Hoffmann and Schnabl (2007).

[Figure 13] [Figure 14]

The turn-around and downswing

According to the overinvestment theory, the pick up of inflation is the first indicator for overheating pressures (Figure 15) and brings about the turn-around. Similarly in CEE, the increase in inflation was followed by a bust. While until 2004 countries with fixed exchange rates outperformed countries with flexible exchange rates, inflation increased in these countries from 2005 to 2007. At the same time inflation in the euro area increased. This dampened the macroeconomic outlook and thereby the stability of the markets, especially after the ECB started to raise interest rates due to inflationary pressure in 2006. Then asset prices and credit growth stagnated. This provides evidence in favor of an unsustainable credit boom.

[Figure 15]

Additionally, the emergence of the crisis in the US in 2007 and its transmission to Europe led to higher interest rates and falling output as investors invest less in emerging markets when they need liquidity in the safe havens. Due to fewer capital inflows the CEE economies faced a strong depreciation pressure. Therefore, the risk premium for investment projects increased dramatically. Thus, the lending-deposit rate spread increased from 2007 to early 2009. The inclusion of the risk raised costs of investment *(volatility and exchange rate risk)*. Interest rates increased (Figure 2). Therefore many investment projects that seemed profitable before were not sustainable anymore. The investment activity stagnated and asset prices fell. (Figure 8).

Because less capital is available at higher costs, the countries in CEE see a strong contraction and real depreciation in the current crisis. In countries with fixed exchange rates, wages have to decline to keep up competitiveness. For instance in Estonia, where wages are relatively flexible, a wages cut is expected for 2009. Countries with rather floating exchange

rates like Poland depreciated strongly to adjust to the new situation. In this case, repaying credit lines denominated in euro becomes more expensive. Up to now, the crisis has hit Latvia and Hungary the most. They have had to ask for IMF money because of rising deficits bringing the countries close to insolvency.

5 Economic policy implications

This paper has focused on explaining how overinvestment due to easy liquidity conditions in the EMU and buoyant (foreign) credit growth can emerge in the small open economies of CEE. The empirical analysis has provided evidence in favor of a liquidity transmission from the EMU to CEE. At the same time there are some signs of a credit boom prior to the current crisis. This may signal overinvestment in the sense of the Mises-Hayek theory which may have endogenously contributed to the cyclical downturn.

Policy Implications

To lower the probability of economic turmoil in the future and cope with the current crisis the following policy implications arise from the paper, even though I am aware of that there is not a full insurance against speculation and false risk assessment:

First, as outlined by the overinvestment theory, the money market rate has to be close to its natural rate to reduce the risk of overinvestment cycles in the EMU and CEE, respectively. Thus, credit creation (banking sector) has to be brought under control by improved risk assessment and supervision. From this perspective, the current measures for a better supervision of the banking sector and the ECB paying attention to monetary aggregates provide hope for the future. But as credit creation may increase widely without additional money supply from the central bank, future monetary policy models could consider taking

into account asset prices and credit aggregates (Borio 2008), or departing from assumptions of perfect information of the banking sector (Lombari and Sgherri 2007) to improve the prediction of future natural rates and keep credit conditions under control.

Second, from Mises's and Hayek's point of view, policy-induced credit expansions are not adequate to counteract a crisis as they delay the structural adjustment and prevent the reallocation of resources. Likewise, the events during the Asian crisis and following the dot-com bubble show that expansionary fiscal and monetary policies may cause moral hazard of the private sector, new distortions and new overinvestment cycles (Saxena and Wong 2002, Schnabl and Hoffmann 2008). In this sense, the current Bundesbank/ECB strategy is promising as it seems to acknowledge these findings when Jürgen Stark (member of the executive board of the ECB) announced that *"the financial crisis can't be solved with rate cuts"* because *"the lower rates are the less incentive banks have to clean up their balance sheets and carefully monitor their credit risks"* (Bloomberg 2009). Furthermore, Axel Weber (2008) argues that in the future liquidity conditions have to be restricted as they were loosened in the crisis (more symmetrically than before) to lower the probability of new bubbles or inflation.

Third, as the CEE countries with floating exchange rates have seen strong depreciations and thereby raising foreign debts in the current crisis, exchange rate stabilizers should try to keep the peg to prevent their economy from further credit defaults. The IMF further promotes a fast euro adoption (The Baltic Times 2009). Instead of depreciating the countries' currencies, then flexibility in labor markets may help to adjust to the new situation (Mundell 1961). To regain competitiveness countries could cut wages to reverse the exuberated wage increases from the boom.

However, with the exception of countries like Estonia that cut wages strongly in the current crisis, wages and labor markets are not necessarily flexible in the short-term (Latvia, Lithuania). And even though cutting wages and pushing for more labor market flexibility may

depreciate a currency in real terms, there remains a danger of a downward-spiral in consumption, which can further dampen the economic activity. But holding the peg may favor countries that seek to adopt the euro as soon as possible.

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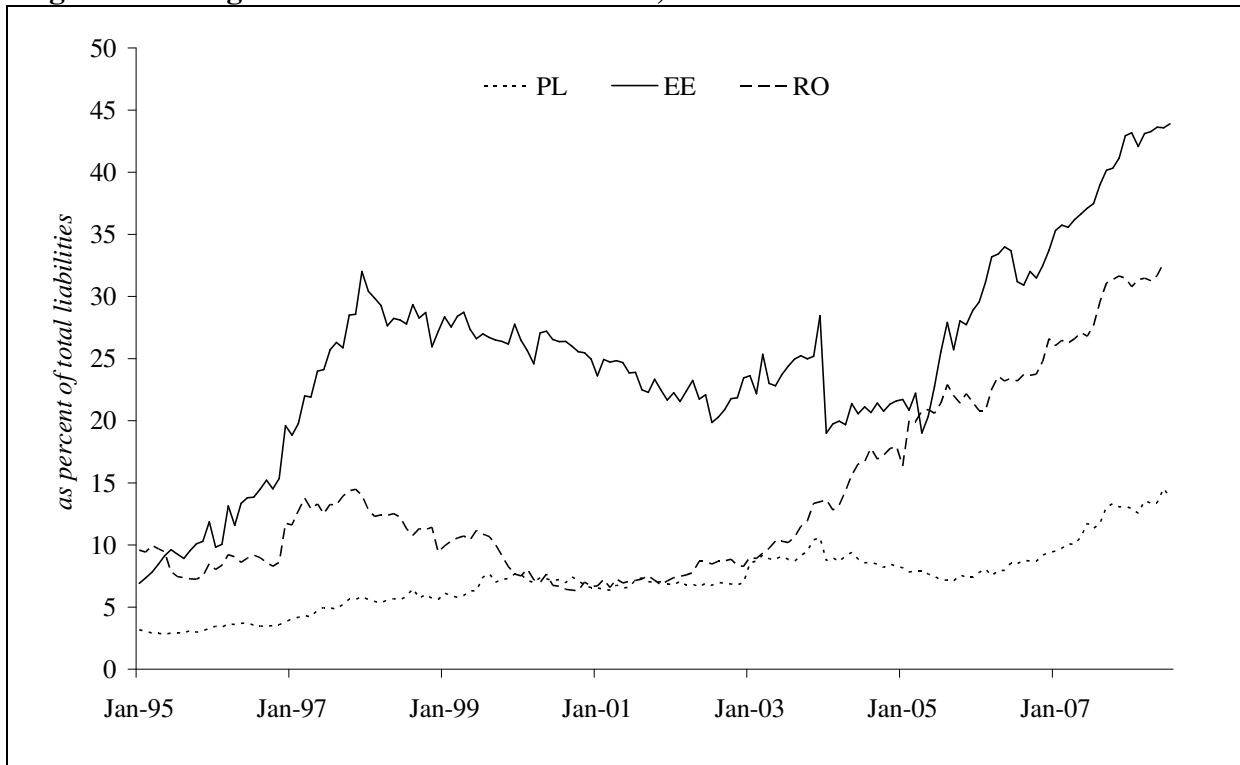
Figure 1: Capital Flows from EMU to CEE
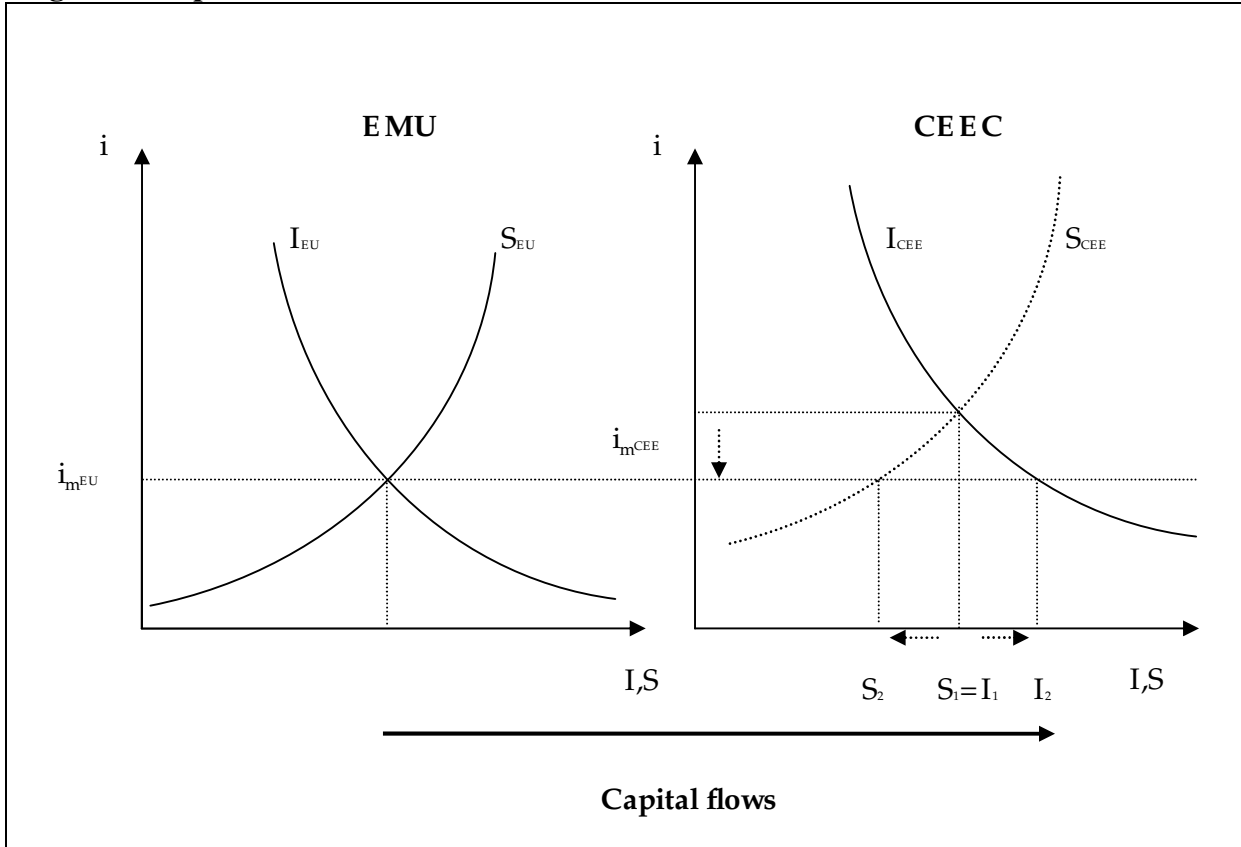
Source: Own illustration.

Figure 2: Interest rates in the euro area, Poland, Estonia and Romania: 1995-2008
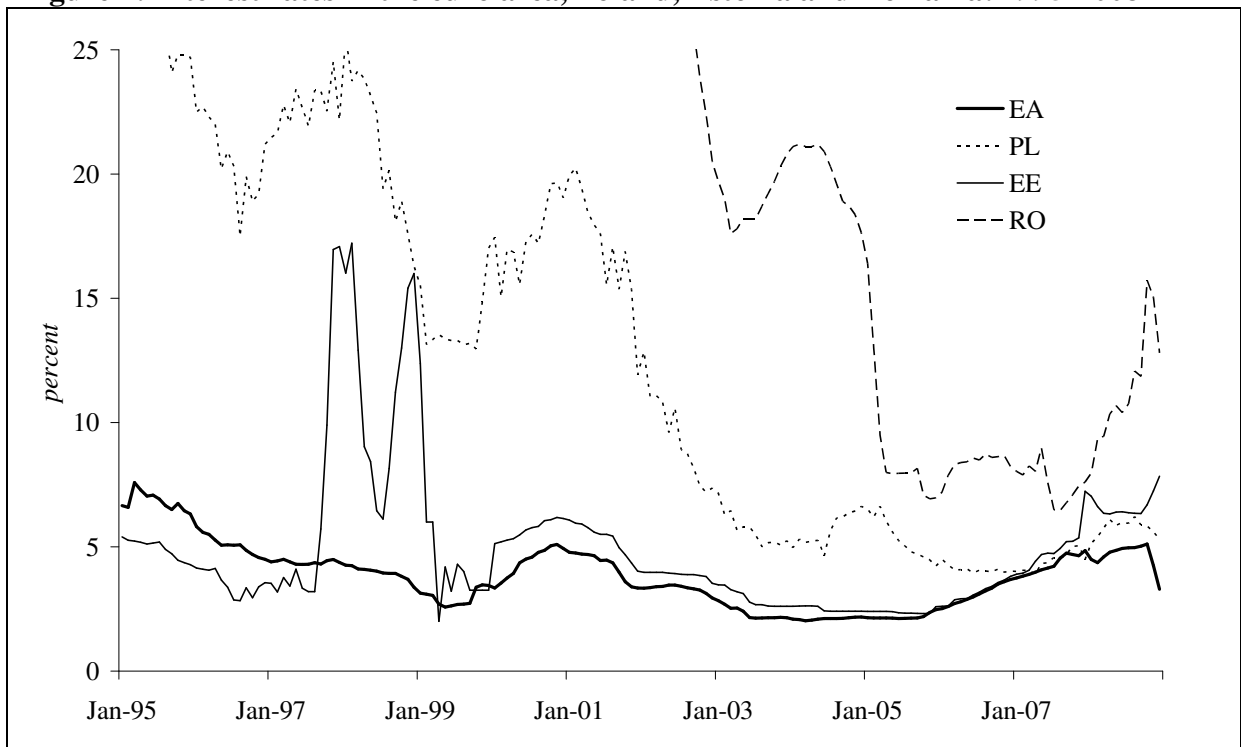
Source: IMF, IFS 2009 (Money market rates). PL, EE and RO represent the different exchange rate strategies of the CEE.

Figure 3: Foreign liabilities of banks in Poland, Estonia and Romania: 1995-2008

Source: IMF, IFS 2009. PL, EE and RO represent the different exchange rate strategies of the CEE.

Figure 4: Lending-deposit rate spread in Poland, Estonia and Romania: 1995-2008
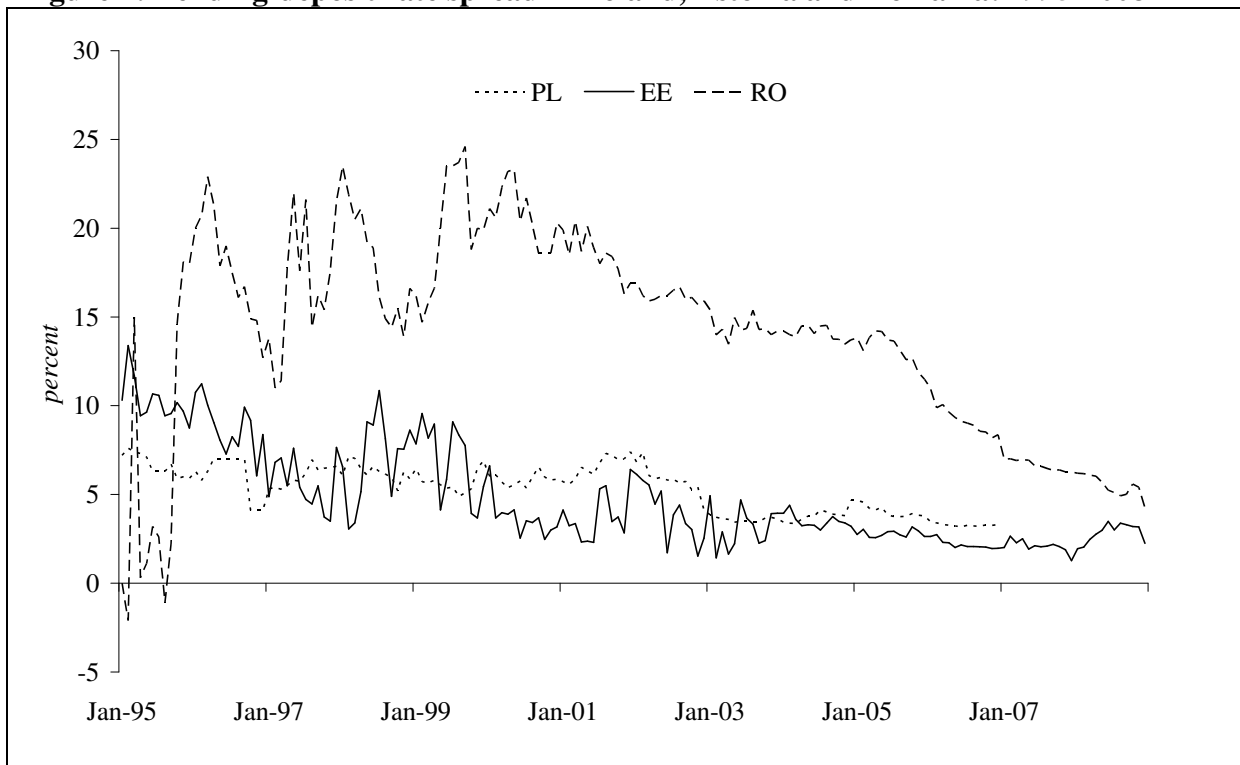
Source: IMF, IFS 2009. PL, EE and RO represent the different exchange rate strategies of the CEE.

Table 1: Granger Causality of the interest rate gaps in the EMU and CEE

Causality relation tested	Obs. (lags)	F-statistics	Prob.
EMU gap do not GC BU gap	131	3.995	**0.021****
BU gap do not GC EMU gap	(2 lags)	0.096	0.909
EMU gap do not GC CZ gap	111	10.053	**0.000*****
CZ gap do not GC EMU gap	(2 lags)	6.604	0.002***
EMU gap do not GC EE gap	131	0.357	0.700
EE gap do not GC EMU gap	(2 lags)	0.246	0.782
EMU gap do not GC HU gap	102	2.342	**0.100***
HU gap do not GC EMU gap	(2 lags)	2.898	0.059*
EMU gap do not GC LT gap	102	7.687	**0.000*****
LT gap do not GC EMU gap	(2 lags)	1.092	0.339
EMU gap do not GC LV gap	101	4.301	**0.016****
LV gap do not GC EMU gap	(2 lags)	1.012	0.365
EMU gap do not GC PL gap	102	3.128	**0.048****
PL gap do not GC EMU gap	(2 lags)	1.465	0.236
EMU gap do not GC SI gap	131	1.059	0.349
SI gap do not GC EMU gap	(2 lags)	0.268	0.766
EMU gap do not GC SK gap	97	4.243	**0.017****
SK gap do not GC EMU gap	(2 lags)	1.801	0.171
EMU gap do not GC RO gap	49	4.248	**0.021****
RO gap do not GC EMU gap	(2 lags)	2.625	0.084*

***, ** and * indicate levels of significance at the 10, 5 and 1 percent level. The Schwartz test suggested the use of 2 lags. Using 3 or 4 lags improve the levels of significance.

Table 2: Granger causality of EMU rates and Rates in NMS

| Money market rates	Obs	F-statistics	Prob.
EMU rates do not GC EE rates	131	6.147	**0.003*****
EE rates do not GC EMU rates	(2 lags)	0.329	0.720
EMU rates do not GC BU rates	131	6.974	**0.001*****
BU rates do not GC EMU rates	(2 lags)	0.605	0.548
EMU rates do not GC CZ rates	132	2.450	**0.090***
CZ rates do not GC EMU rates	(2 lags)	0.015	0.985
EMU rates do not GC HU rates	132	5.689	**0.000*****
HU rates do not GC EMU rates	(2 lags)	2.620	0.077*
EMU rates do not GC LT rates	131	0.685	0.506
LT rates do not GC EMU rates	(2 lags)	0.055	0.946
EMU rates do not GC LV rates	131	7.220	**0.001*****
LV rates do not GC EMU rates	(2 lags)	1.493	0.229
EMU rates do not GC PL rates	132	10.010	**0.000*****
PL rates do not GC EMU rates	(3 lags)	1.798	0.151
EMU rates do not GC SK rates	131	0.050	0.951
SK rates do not GC EMU rates	(2 lags)	1.491	0.229
EMU rates do not GC SI rates	132	0.430	0.651
SI rates do not GC EMU rates	(2 lags)	0.204	0.816
EMU rates do not GC RO rates	131	0.897	0.410
RO rates do not GC EMU rates	(2 lags)	3.407	0.036**

The lags used are taken from the Schwartz test. For more lags as suggested by the Akaike criterion, the results remain unchanged and significance improves. Then the Slovakian interest rate is Granger caused by the EMU rate. Lithuanian and Slovenian interest rates are Granger caused by EMU rates after 2001.

Figure 5: Credit to the private sector/ assets in Poland, Estonia and Romania: 1995-2008
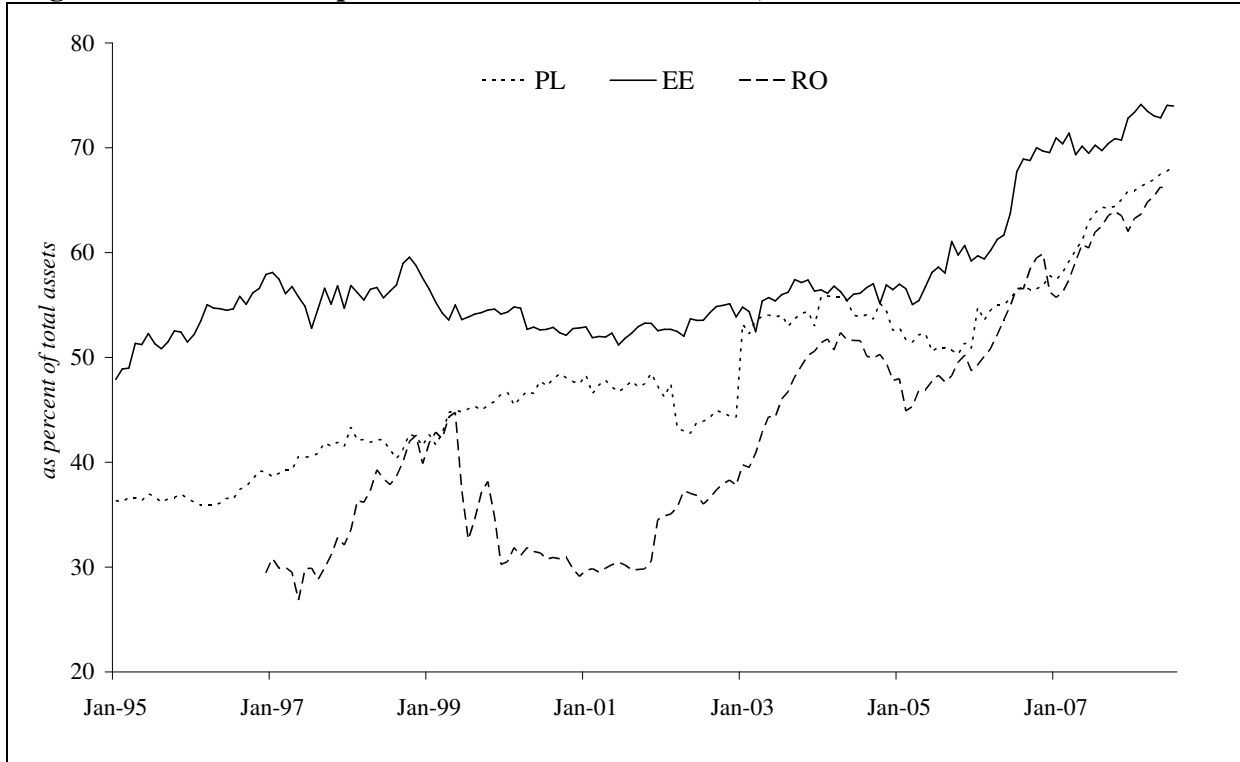
Source: IMF, IFS 2009. PL, EE and RO represent the different exchange rate strategies of the CEE.
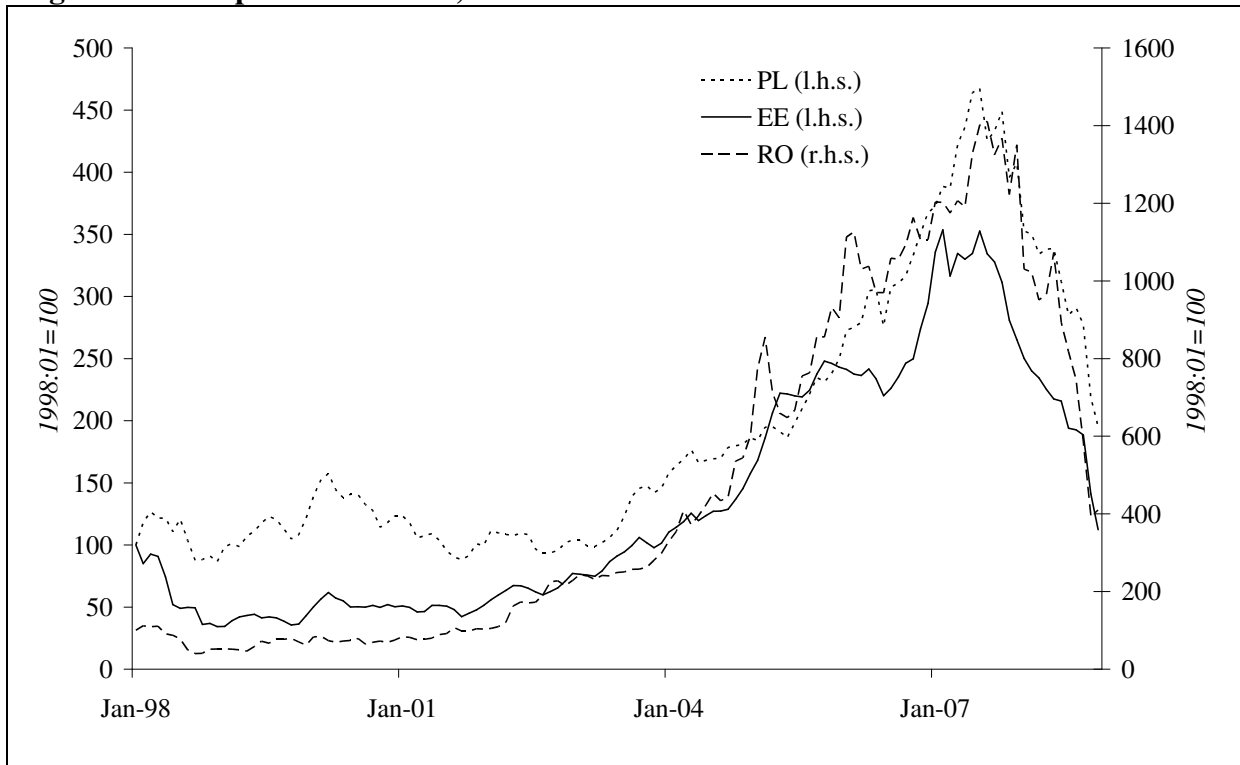
Figure 6: Development of the banks' credit-deposit ratio in CEE and Germany
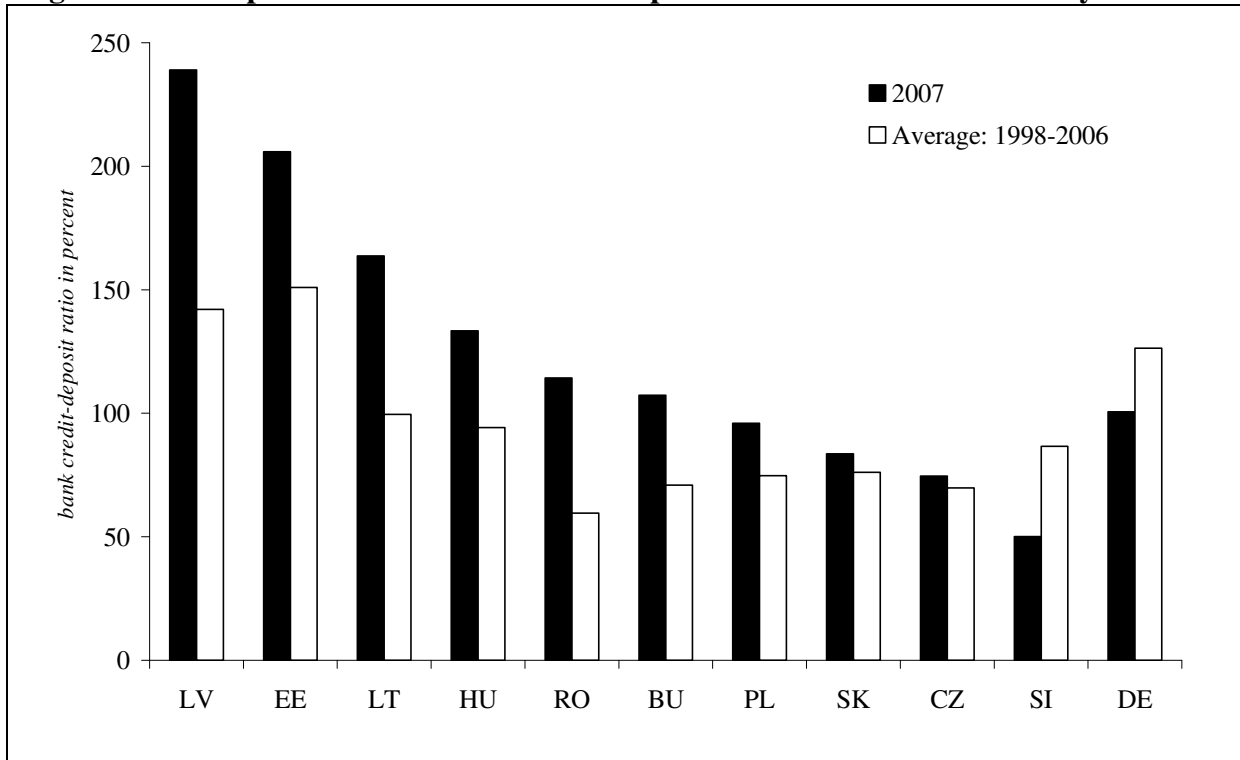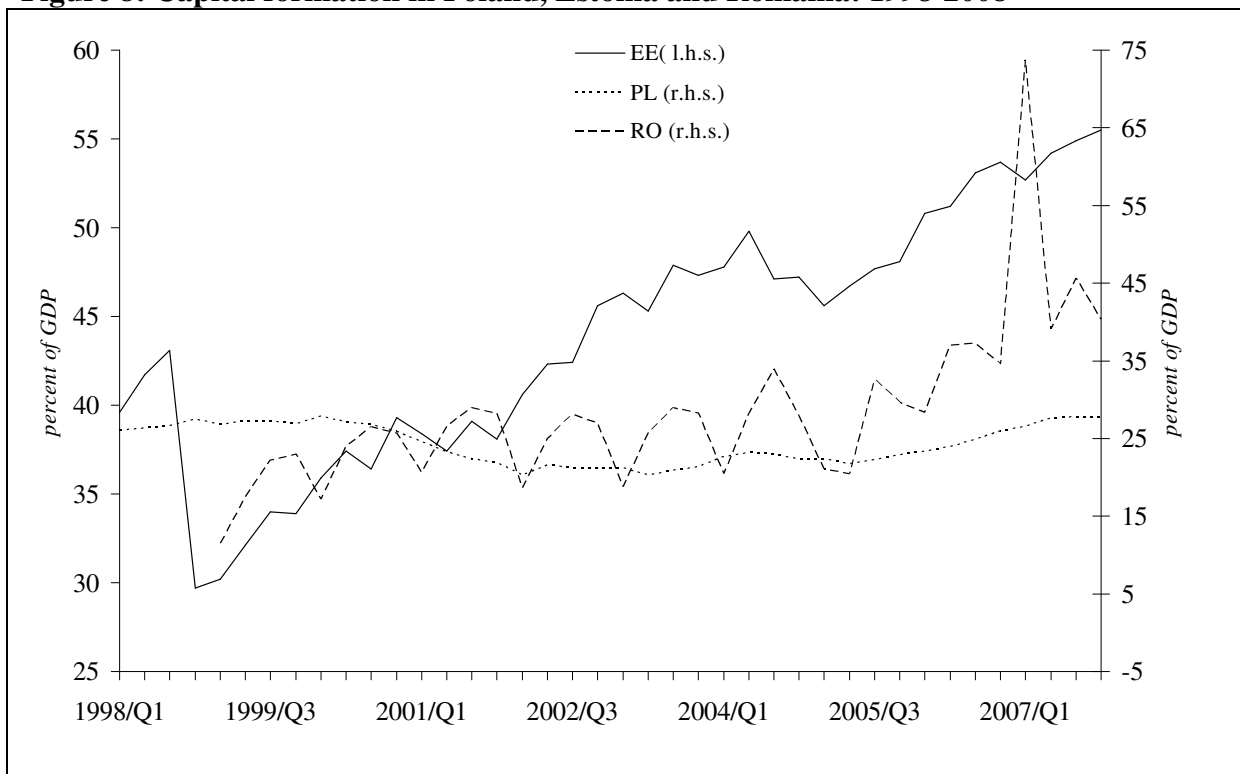

Source: World Bank, 2009.

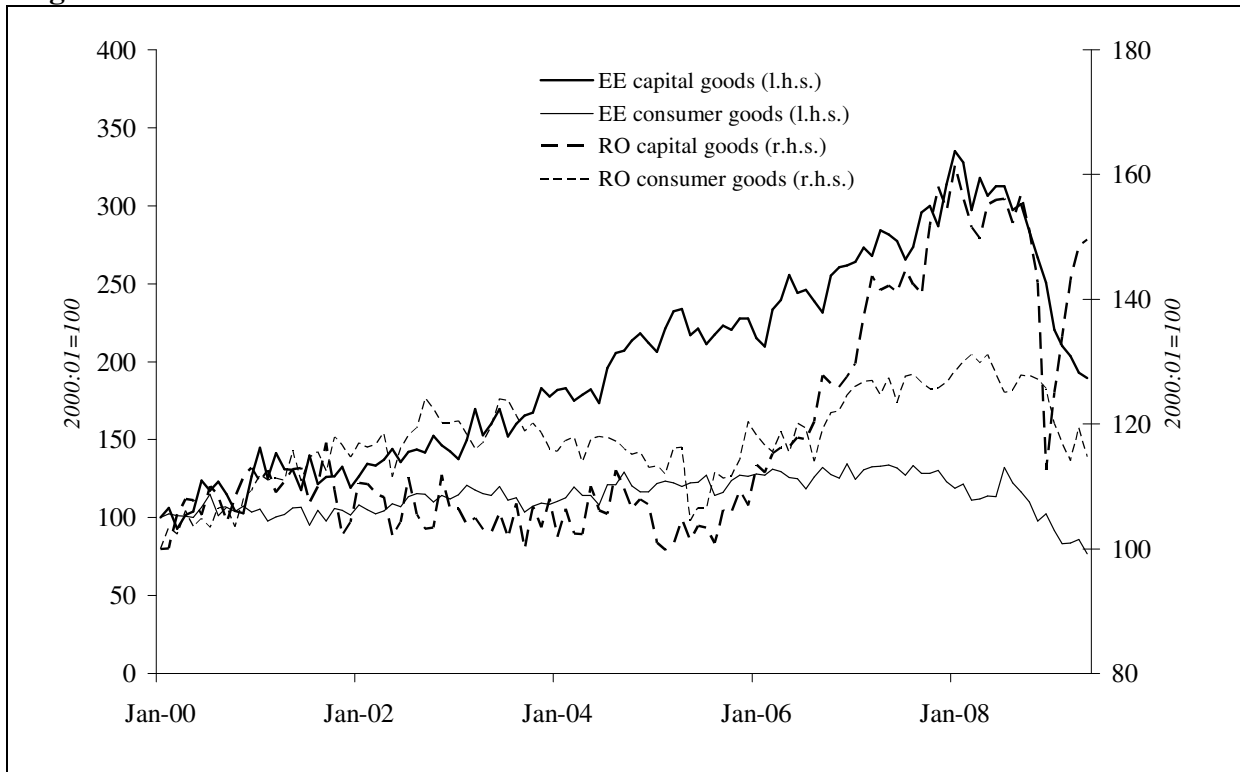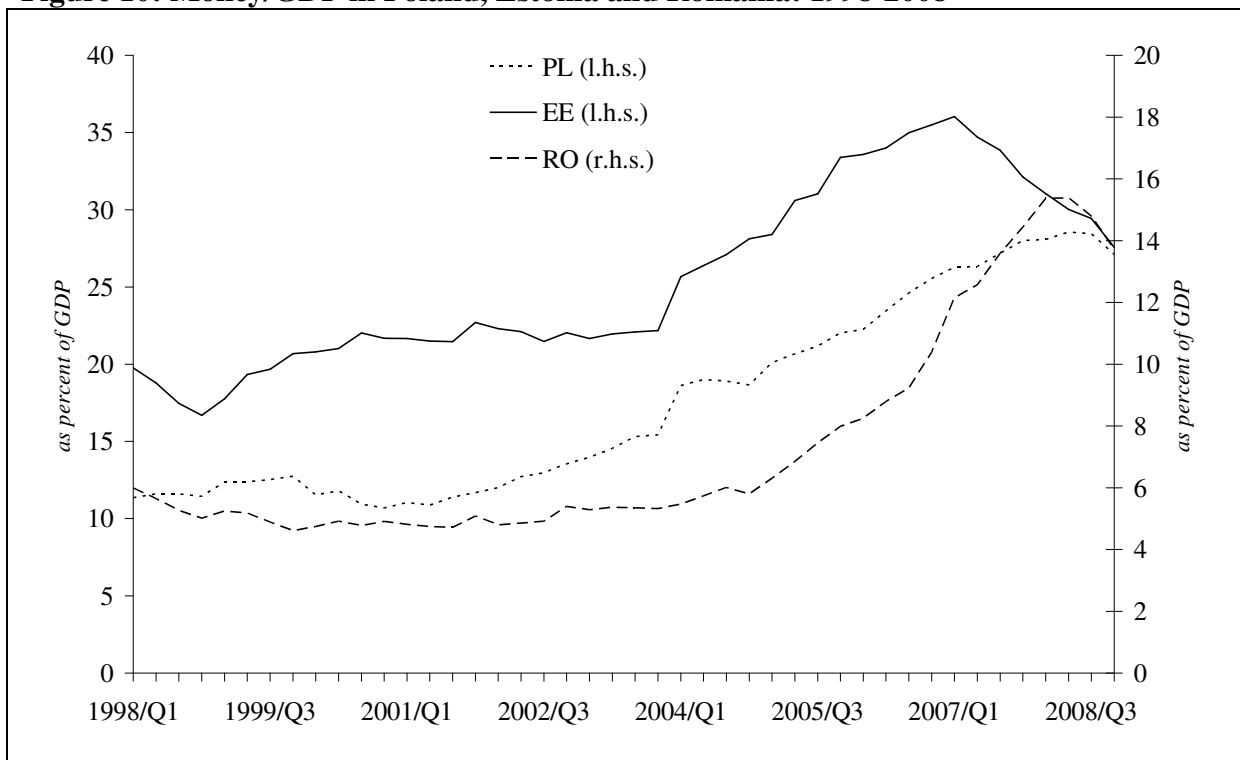**Figure 7: Asset prices in Poland, Estonia and Romania: 1998-2008**

Source: IMF, IFS 2009. Share prices. PL, EE and RO represent the different exchange rate strategies of the CEE.

Figure 8: Capital formation in Poland, Estonia and Romania: 1998-2008

Source: IMF, IFS 2009. Investment per GDP. PL, EE and RO represent the different exchange rate strategies of the CEE. The Romanian data is not seasonally adjusted but shows the necessary.

Figure 9: Production structure in Estonia and Romania: 2000-2008

Source: Ecowin, 2009.

Figure 10: Money/GDP in Poland, Estonia and Romania: 1998-2008

Source: IMF, IFS 2009. PL, EE and RO represent the different exchange rate strategies of the CEE.

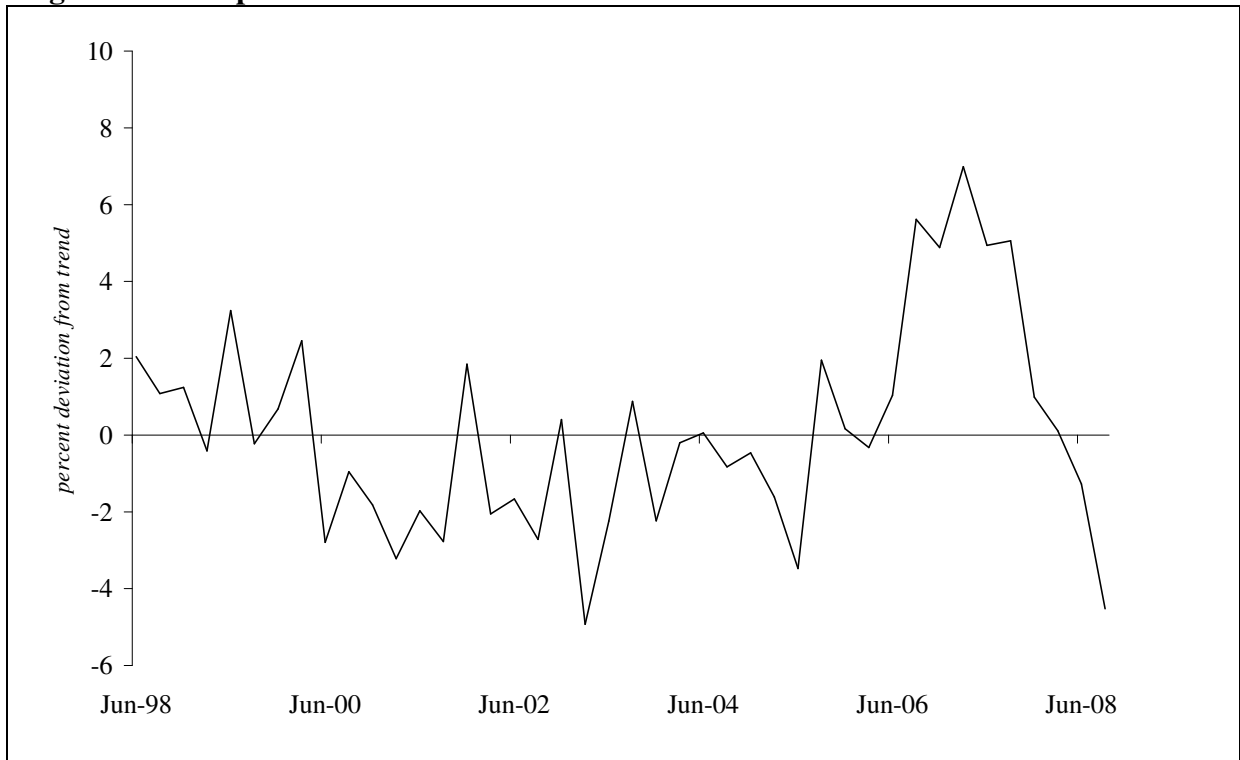**Figure 11: Foreign exchange reserves in CEE: 1994-2008**
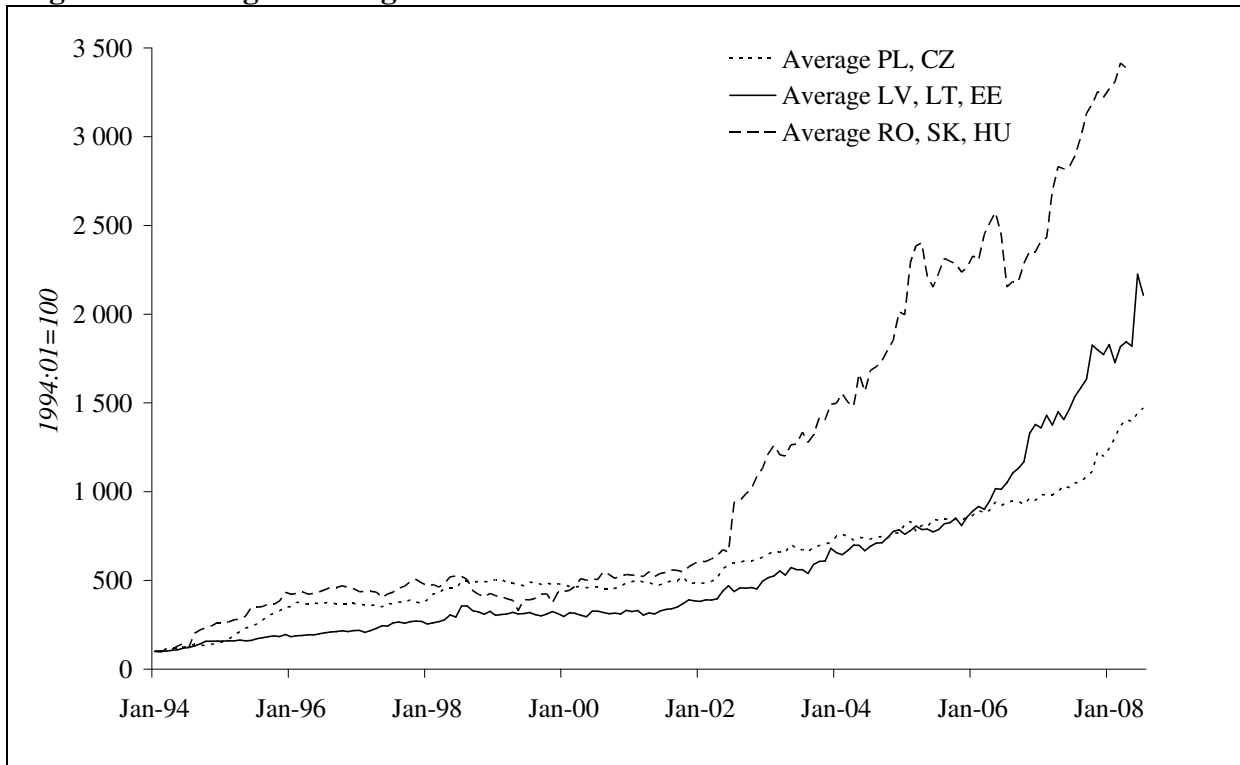
Source: IMF, IFS 2009. Averages represent different exchange rate regimes.

**Figure 12: Real appreciation in CEE 1994-2008**
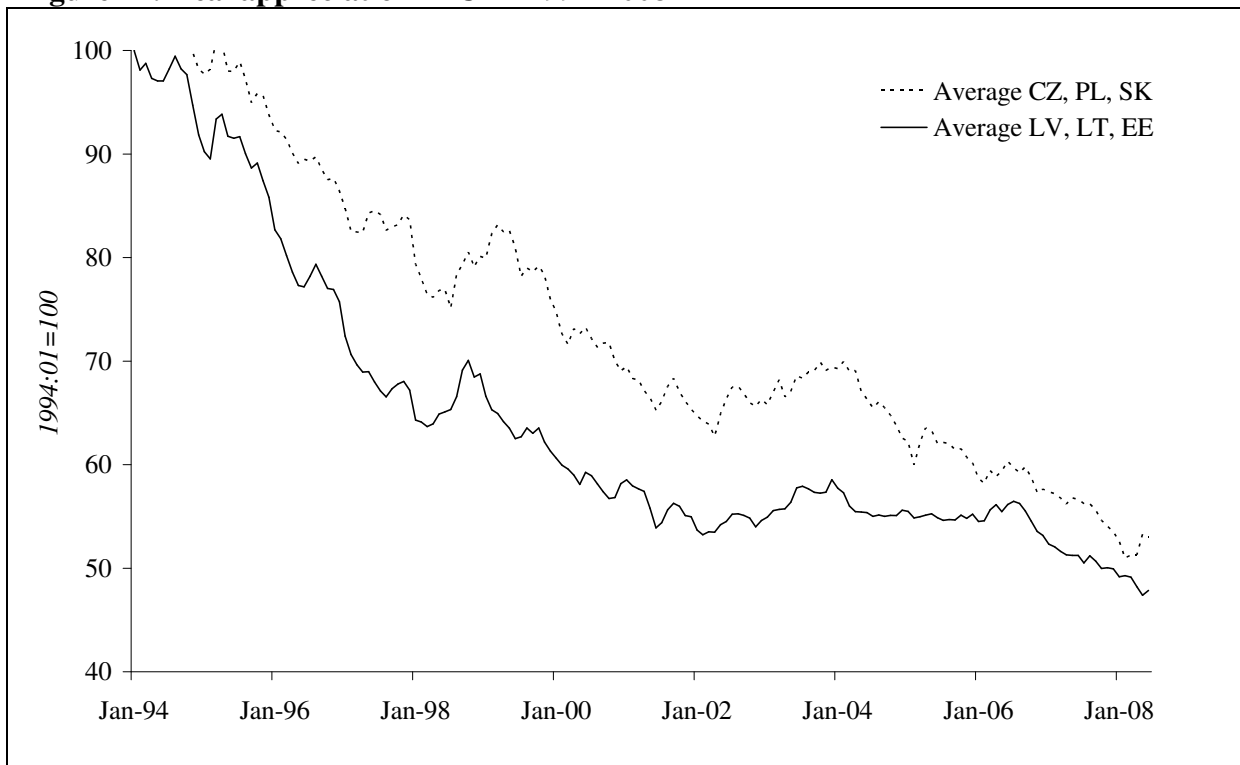
Source: IMF, IFS 2009. Averages represent countries with rather flexible and fixed exchange rate regimes.

**Figure 13: Composite credit boom index for CEE**

Source: IMF, IFS 2009. Average index for the CEE of investment/GDP, money/ GDP and asset price development from the hp-trend.

Figure 14: Credit boom components and deviations from trend
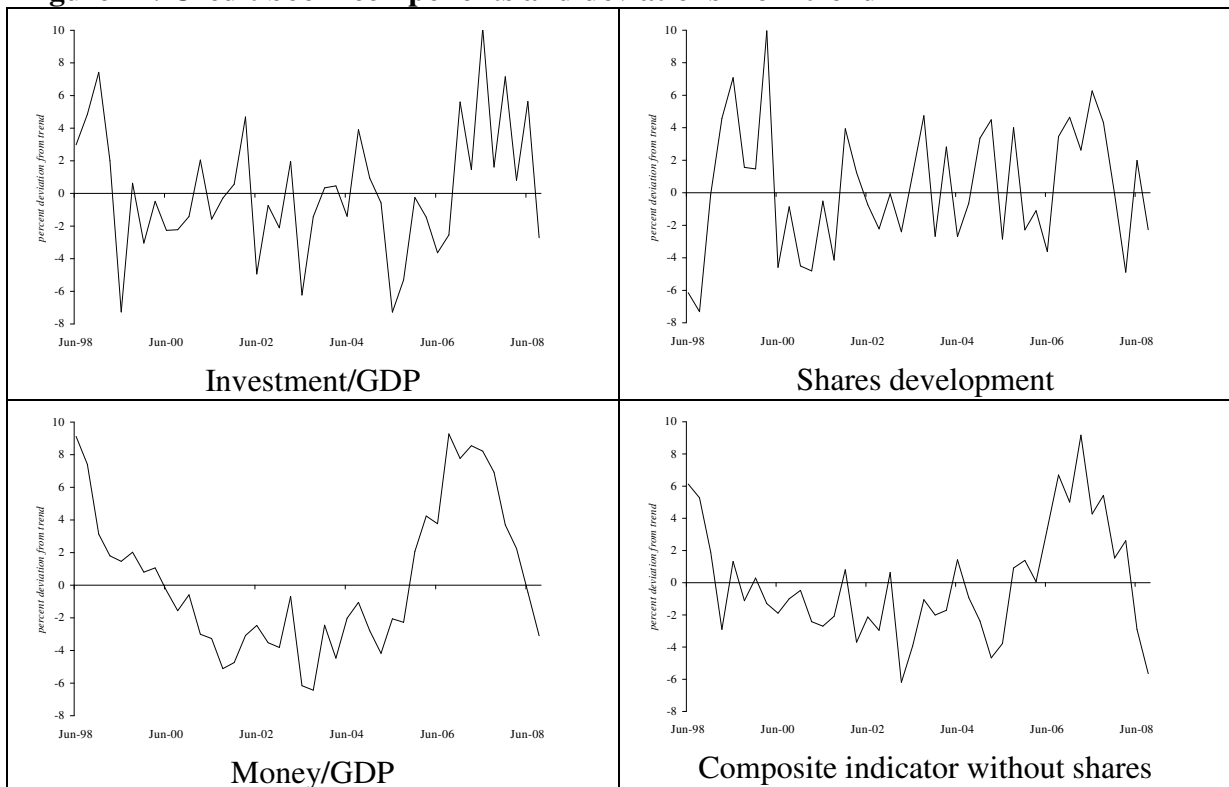
Source: IMF, IFS 2009. Average index for the CEE of investment/GDP, money/ GDP and asset price development from the hp-trend.

Figure 15: Inflation in CEE and Germany 1994-2008
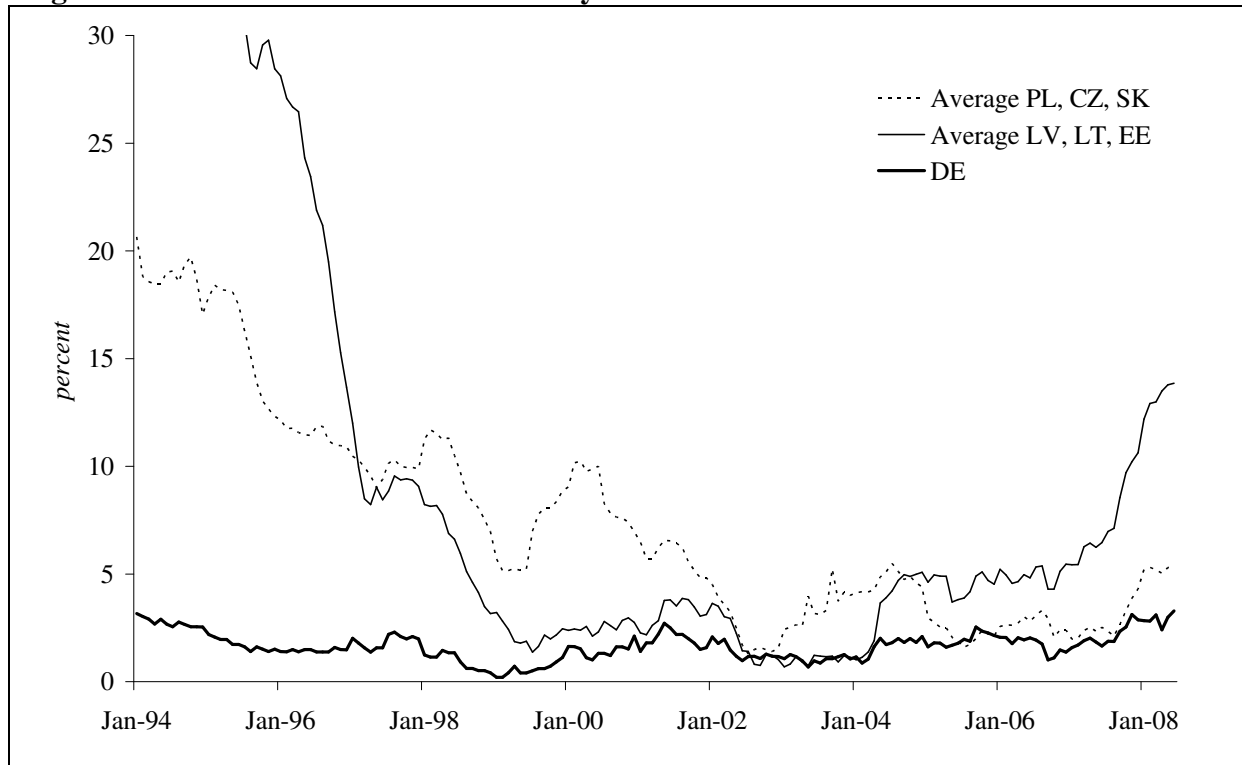
Source: IMF, IFS 2009. Averages represent rather flexible or fixed exchange rate regimes.