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EU8+2

## CREDIT EXPANSION IN EMERGING EUROPE: A CAUSE FOR CONCERN?

### 1. Introduction

Rapid credit growth in Emerging Europe, generally considered a sign of catching-up with the “old” Europe, has begun receiving considerable attention among investors and policy makers alike. Reports from investors and international financial institutions reveal some nervousness and reflect this in a growing focus on vulnerability indicators.<sup>2</sup> Meanwhile, publications by many central banks in the region address the difficult balancing act between financial deepening supporting output growth and potentially excessive credit expansion leading to macroeconomic and financial vulnerabilities.<sup>3</sup> Given heightened global risks and the demands under the European Union accession process, the need to better understand the drivers of credit growth in Emerging Europe and associated risks is strong.

Previous episodes of very rapid credit growth have often been associated with the emergence of sizeable macroeconomic imbalances and surging asset prices, followed by subsequent corrections, busts, or outright financial crises. Further, euphoria-led credit booms have often led banks to increasingly focus and reassign staff to the generation of new loans to the detriment of credit monitoring and risk appraisal. As a result, such episodes have frequently been associated with eventual increases in non-performing loans (NPLs) and banking sector problems.<sup>4</sup>

We attempt to examine these concerns by focusing on the nature of the recent credit expansion and the banking sector’s health and vulnerability while taking a holistic approach and assessing the macroeconomic, financial and corporate sector conditions and their interrelations. The analysis is based on macroeconomic trends established from widely available sources and bank level data from BankScope.<sup>5</sup>

<sup>1</sup> Draws on a background paper prepared by Sophie Sirtaine and Ilias Skamnelos, ECSPF, World Bank.

<sup>2</sup> For example, ING (2006) “Thai with a twist”, Danske Bank (2006) “Be careful! Risk on the rise”, or cautionary reports by the IMF (WEO, 2004) and the ECB (Papademos, 2005).

<sup>3</sup> The importance of financial deepening for growth has received a lot of attention recently with studies such as Levine et al (2000), while many other studies such as Kaminsky and Reinhart (1999) point to financial distress associated with rapid credit expansion.

<sup>4</sup> Fitch Ratings has calculated that about 70 percent of banking crises since the 1980s were preceded by over-lending, with most crises happening in countries characterized by weak banking systems and prudential frameworks.

<sup>5</sup> We are grateful to Natalia Tamirisa (IMF) and Ugo Panizza (IADB) for sharing BankScope data.

We find that while the rapid credit expansion across the region to a large degree reflects financial integration and deepening, some countries—notably the Baltic States and to a lesser degree the Southeastern European NMS—have witnessed an outright credit boom in recent years which has contributed to significant macroeconomic imbalances. In particular, the credit-fueled domestic demand upsurge has exerted upward pressure on prices in asset, goods and labor markets leading to strong real exchange rate appreciation, low or negative real interest rates, and large current account deficits. The very rapid expansion of credit to the household sector, including for housing and in foreign currency, is also causing concern about potential stock and real estate price bubbles as well as currency and liquidity risks in the banking sectors. Nevertheless, banking systems in the region, which are dominated by Western European banks, appear to be strong and able to withstand sizeable potential shocks.

The study is organized as follows: in Section 2, we provide a brief overview of financial sector developments in the region over the past decade. In section 3, we discuss bank credit developments in recent years in more detail. In section 4, we discuss risks and vulnerabilities, both in the banking sector and in asset markets and the broader macro economy. We also draw comparisons to and lessons from, episodes of credit booms and financial crises in other parts of the world, including Scandinavia, Asia, and Southern Europe. Finally, section 5 concludes and discusses policy implications.

## 2. Overview of Financial Sector Developments 1996-2006

### 2.1. Evolution of financial sector assets and the evolving role of capital markets

The former-socialist East and Central European countries entered the European Union (EU) in May 2004 (the EU8) and January 2007 (Bulgaria and Romania) with the reform of their banking systems mostly completed.<sup>6</sup> Despite several banking crisis episodes in the region in the 1990s, on the eve of EU accession they had relatively modern banking systems. This is because most of the EU8+2 undertook bank restructuring and privatization efforts, which were followed or complemented by consolidation, growing integration of banking and non-banking services and rapid development of new financial products and services.

Despite the impressive progress, all EU8+2 countries face the challenge of financial system deepening and they remain far behind the euro-zone (the EU12) both in respect of bank and non-bank financial institutions, including capital market development. In some countries, the total assets of financial institutions (banks, insurers, pension funds and investment funds)<sup>7</sup> still constitute less than 50% of GDP (Latvia and Romania). But even in countries having a ratio higher than 120% (Croatia, Estonia, and Slovenia), it is still several times lower than the EU12 benchmark. Although non-bank financial institutions have been growing rapidly in recent years,<sup>8</sup> the banking sector strengthened, or at least kept its position, and still remains the main player with assets ranging from 70% (Poland) to 96% (Romania) of total financial sector assets at the end of 2005 (Chart 1).

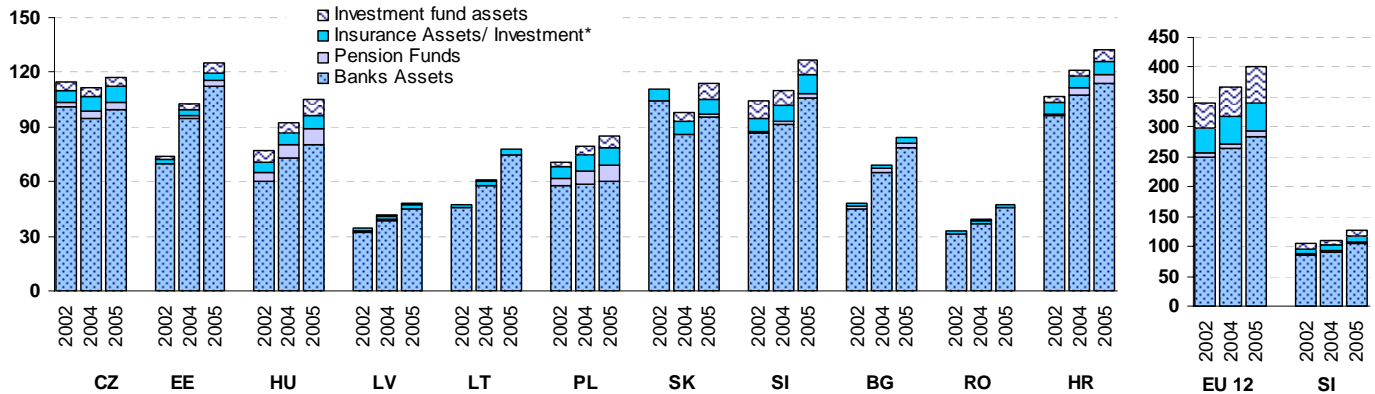
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<sup>6</sup> In most charts and tables we show Croatia as a comparator country, because most tendencies are similar to those in other countries in the region.

<sup>7</sup> Because of the marginal value of other institutions like brokerage houses, leasing, factoring and venture capital institutions in relation to GDP and problems with the collection of comparable data, assets of these institutions were not taken into account.

<sup>8</sup> Insurers increased their assets especially in the Visegrad countries, Slovenia and Croatia; pension funds in countries which introduced comprehensive multi-pillar pension reforms (Hungary, Poland, Croatia); and investment funds in all countries except Lithuania, Latvia, Bulgaria and Romania.

**Chart 1. Assets of the Main Financial Institutions in the EU8+2 and the Euro-zone (% of GDP)**

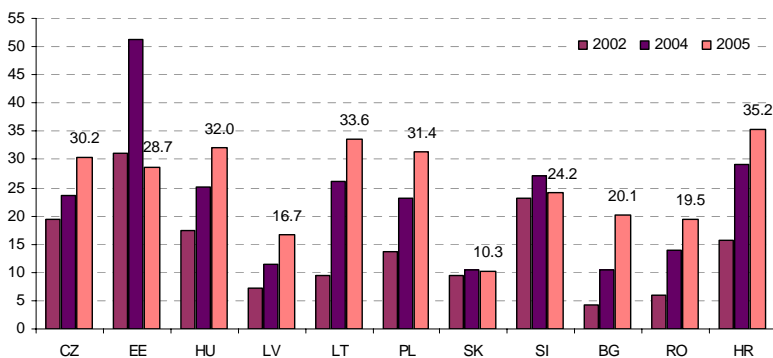


Note: For the EU8 data refers to insurance companies' investment; for BG, RO and HR it refers to total assets of insurance companies.

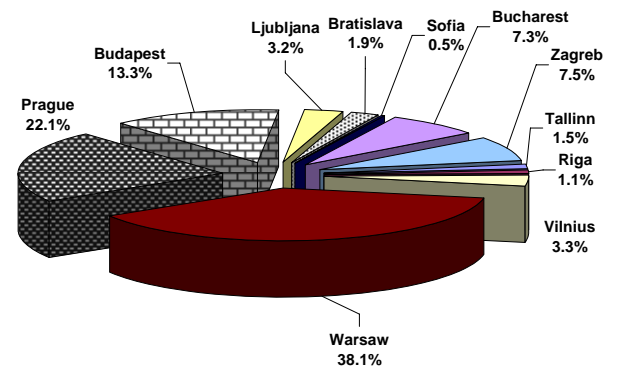
Source: ECB; national central banks.

Despite recent rapid growth, equity markets in the region remain small. The levels of development vary widely by country both in absolute numbers and as a percent of GDP. Poland, the Czech Republic and Hungary have the largest markets in absolute terms, constituting together around  $\frac{3}{4}$  of the regional equity market. At the end of 2005, stock market capitalization was higher than 30% of GDP only in the Czech Republic, Hungary, Poland, Lithuania and Croatia (Chart 2 and Chart 3). Nonetheless, growth in the last two years has been spectacular, driven by bullish investor sentiment (and numerous debuts partly driven by IPOs in the bigger markets like Warsaw, Prague or Budapest).

**Chart 2. Stock Market Capitalization (% of GDP)**



**Chart 3. Stock Market Capitalization (% of GDP, December 2005)**



Note: The sharp decrease in 2005 in Estonia results from delisting of the blue-chip Hansabank after a take-over by its Swedish parent bank.

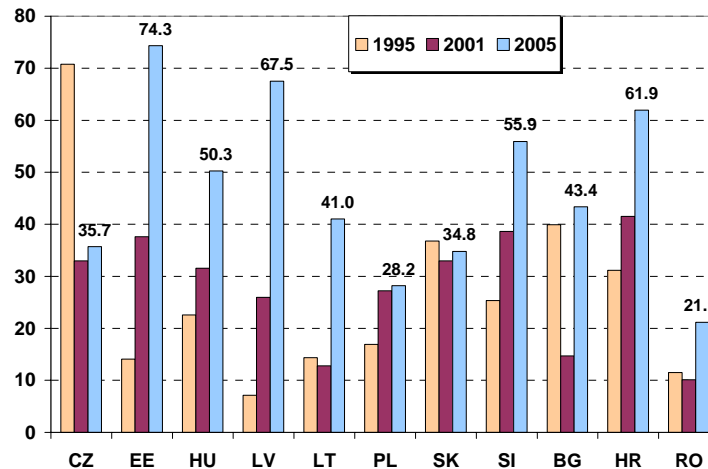
Source: national stock exchanges.

Equity markets in the region are not yet an effective mechanism for corporate sector financing (Bakker and Gross, 2004). Moreover, in countries like Lithuania or Slovakia the market capitalizations are in fact even lower than the data suggest, as many companies that

trade only very infrequently or have a very small free float remain listed.<sup>9</sup> Even in Poland, the most liquid market in the region, funds obtained on the capital market and the increase in non-government debt securities ranged from only 0.2% of GDP to 0.6% of GDP per annum in 2001-2004.

Over the last 10 years, bank credit to the private sector has expanded impressively in all countries except the Czech Republic and Slovakia. But even in those two countries, a modest rebound was observed in recent years, and bank lending accelerated in every country in the region on the back of EU accession and improvements in long-term economic prospects. Nevertheless, there were big differences in ratios of credit to GDP across countries - at the end of 2005, Estonia was leading with a close to 75% ratio, followed by Latvia, Slovenia and Hungary (with ratios over 50%), while it amounted to only 21% in Romania (Chart 4, Chart 5). Furthermore, private credit-to-GDP ratios remain significantly below euro-zone levels, but broadly in line with per capita income levels (Chart 6).

**Chart 4. Bank Credit to the Private Sector (% of GDP, 1995/2001/2005)**



Source: national central banks; World Development Indicators (WDI data for 1995).

<sup>9</sup> Stock markets in smaller countries entered into strategic alliances. Currently, Vilnius, Riga and Tallinn Stock Exchanges are parts of OMX Exchanges which also operate exchanges in Copenhagen, Stockholm and Helsinki. They offer access to most of the securities trading in the Nordic and Baltic marketplace.

Chart 5. Change of GDP per capita and Private Credit (1995-2005)

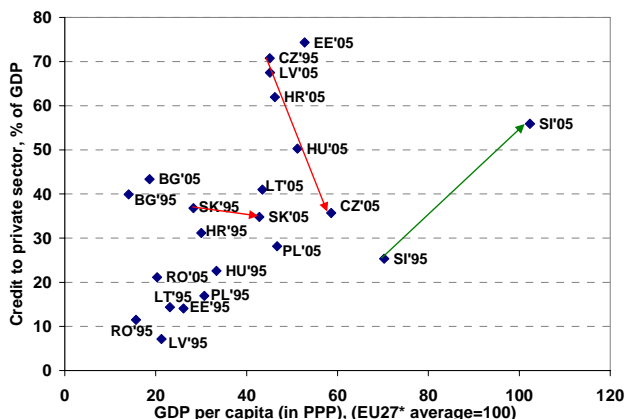
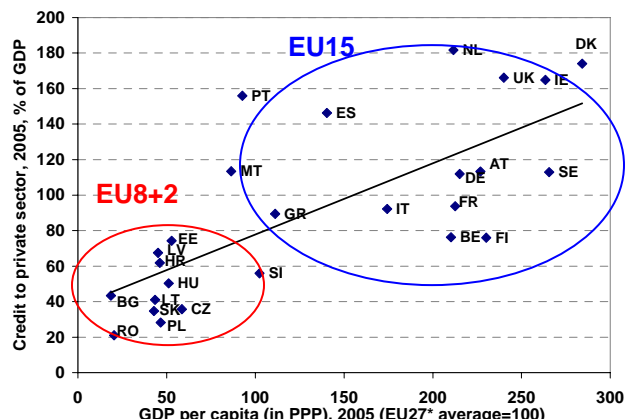


Chart 6. GDP per capita and Private Credit (2005)



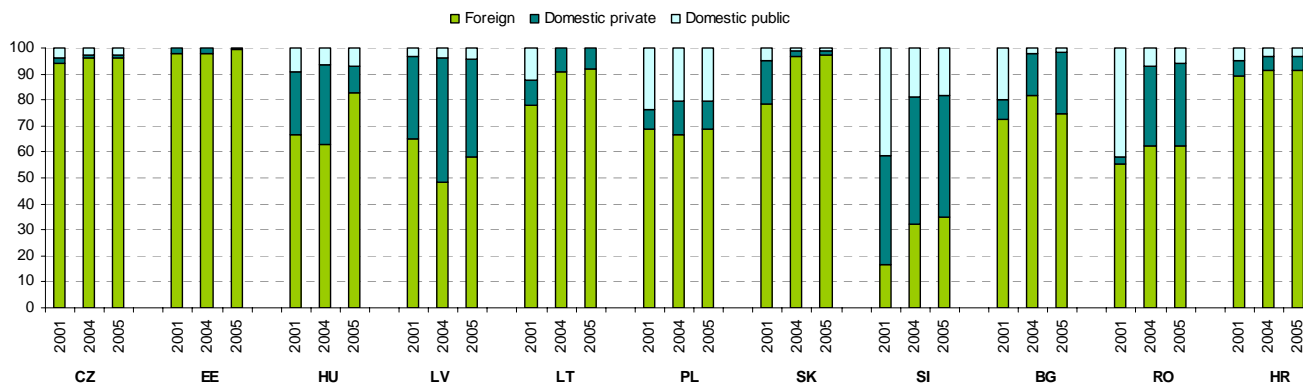
Note: Czech Republic and Slovakia were marked with red arrows as these are the only countries where credit-to-GDP ratio decreased between 1995 and 2005; in the former this was due to the financial crisis in 1997 and in the later it was due to late privatization and restructuring of the Slovak banking sector which started in 2000.

EU27 is a simple average covering current EU Member States (excluding Luxemburg) and Croatia.

Source: national central banks; WDI (data for 1995 and the "old" EU countries).

In most of the EU8+2 countries, foreign-owned banks dominate the banking system (Chart 7). Parent banks are generally from European countries which explains the prevalence of the universal banking model. Entry of foreign banks is usually seen as leading to improved banking practices, especially in terms of credit risk analysis and risk management. Foreign banks have been responsible for the lion's share of the credit growth observed in recent years in the region.

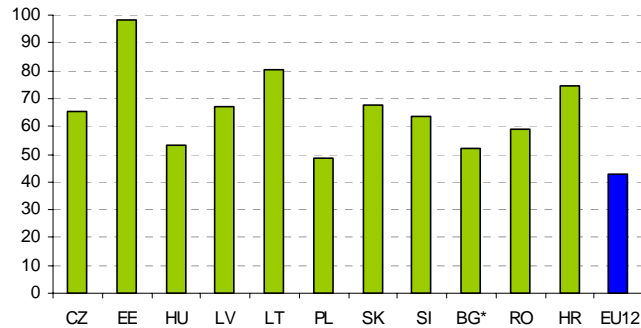
Chart 7. Ownership Structure (% of total assets)



Source: national central banks.

The share of foreign ownership is negatively correlated with host country size and positively correlated with market concentration levels. Estonia is the most prominent example - the smallest country in the region with 99% of bank assets owned by foreigners and 98% of assets concentrated in the five largest institutions (Chart 8). By contrast, Poland had a concentration level below 50%, and it had one of the lowest shares (69%) of foreign ownership (it was only lower in Slovenia and Romania, with 35% and 62%, respectively). Moreover, market concentration is much higher in the region than the 43% observed in the EU12.

Chart 8. Market Concentration (assets of the 5 biggest banks, % of total bank assets, 2005)



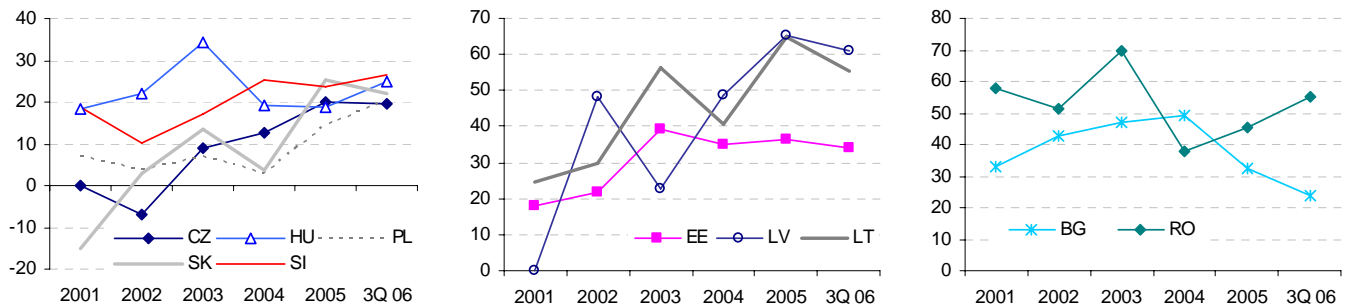
Source: national central banks; for Bulgaria - [www.euroframe.org](http://www.euroframe.org)

### 3. Credit Developments 2001-2006

#### 3.1. Credit developments

As discussed above, in recent years some of the EU8+2 countries recorded very rapid growth in bank credit. Over the last decade, bank lending to the private sector in the EU8+2 countries has been growing at an average annual compounded rate of 24 percent and was particularly strong and sustained in Romania, Bulgaria and the Baltic countries. The trends have continued to accelerate in the last few years in the Baltic countries (reaching annual growth rates of nearly 60 percent in Latvia and Lithuania in 2005 (Chart 9) and in Romania (nearly 45 percent in 2005). Meanwhile, in the Central Eastern European countries, credit growth has been notably lower, especially in Poland, Slovakia and the Czech Republic.

Chart 9. Growth of Credit to the Private Sector (% y/y, 2001-3Q 2006)



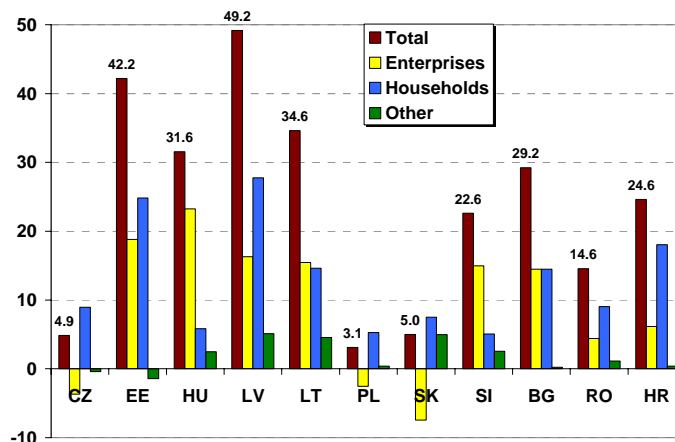
Source: national central banks.

The recent credit expansion is largely a result of increased loans to households, including both consumer and mortgage loans, while growth in corporate sector loans has remained more modest, particularly in the Visegrad countries (Chart 10). In all EU8+2 countries the recent credit expansion (2001-2006) was driven by the household sector - growth of credit to households surpassed that of enterprise loans and in some countries (Poland, Slovakia, Bulgaria and Romania) was even twice as high<sup>10</sup> (Chart 11). Although most recently (since 2004), credit

<sup>10</sup> Credit to the households was a largely underdeveloped market segment and the observed higher growth rates thus result partly from the low initial levels.

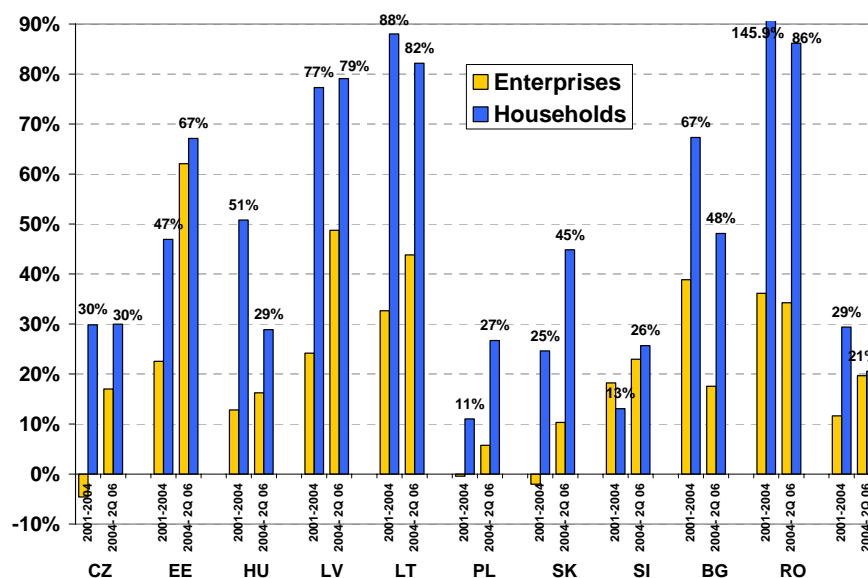
growth to the enterprise sector accelerated in most of the countries (except Bulgaria and Romania), it is still much slower than to the household sector. Only in Estonia, Slovenia and Croatia did loans to both sectors in 2004-2Q 2006 grow at a similar rate. As a result, the share of household loans in bank portfolios has increased significantly in all countries (except Slovenia and Slovakia).

Chart 10. Change in Credit to the Private Sector (% of GDP, 2001 - Q2-2006)



Source: national central banks.

Chart 11. Average Annualized Credit Growth (% , 2001-2004 and 2004 - Q2-2006)

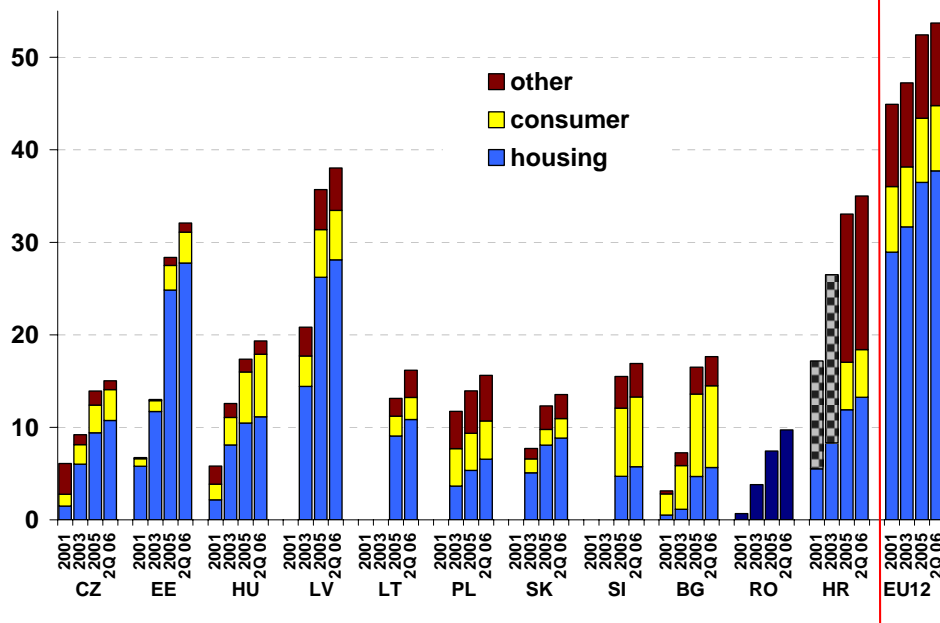


Source: national central banks; and staff calculations.

Among loans to households, housing loans have been growing particularly fast (Chart 12). Between 2004 and 2005 alone, housing loans increased by more than 95% in the Czech Republic, 45% in Slovakia and Poland and 25% in Estonia, Latvia and Hungary. In Latvia and Estonia, total real estate loans outstanding (including mortgages and real estate sector loans) accounted for over 50 percent of total outstanding loans at the end of 2005. However, when compared to the EU15, the level of residential mortgage debt in the EU8+2 remains rather low,

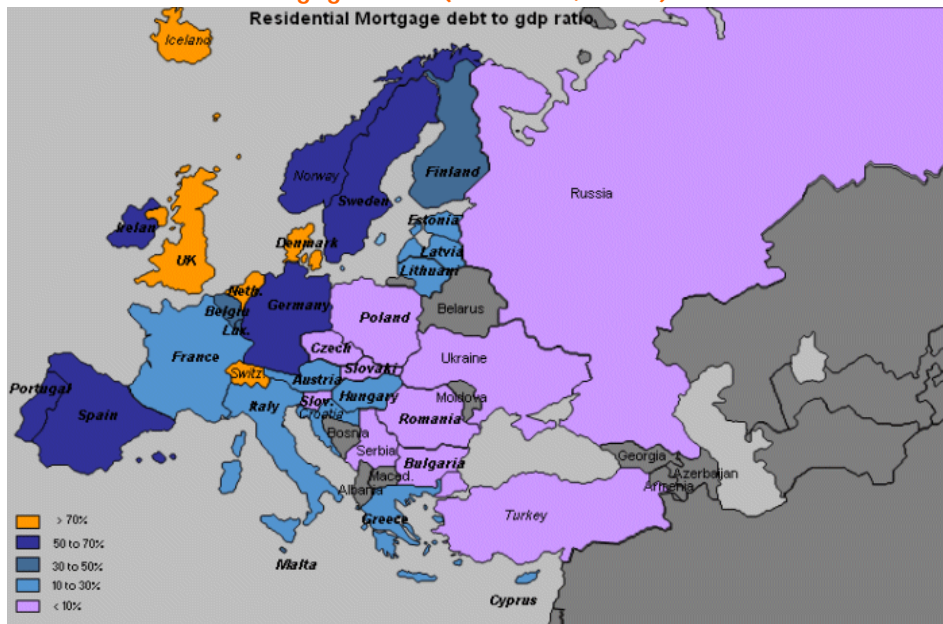
below 30% of GDP in the Baltic countries and Hungary and below 10% in other countries (Chart 13).

**Chart 12. Household Loans by Purpose (% of GDP, 2001-2006)**



Note: For Romania data show total credit to households.  
 Source: national central banks; and staff calculations.

**Chart 13. Residential Mortgage Debt (% of GDP, 2005)**

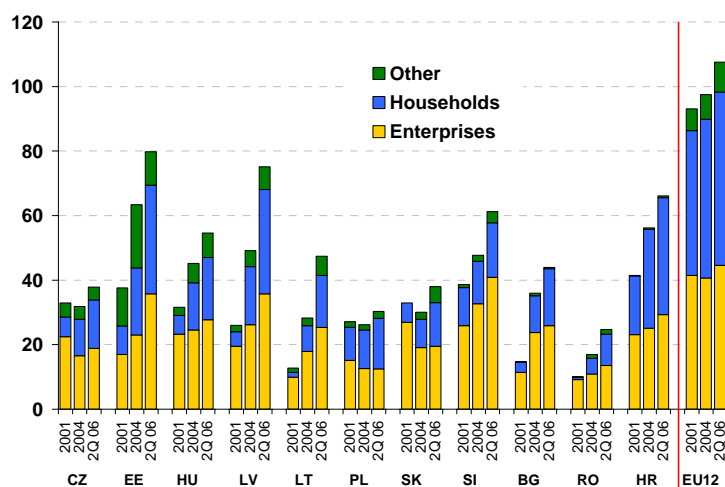


Source: European Mortgage Federation.

Despite the rapid growth, the level of private credit-to-GDP in the EU8+2 countries in mid-2006 generally remained low compared to the euro-zone (Chart 14). Credit to the enterprise

sector in the region ranged between 13 percent of GDP in Poland and 41 percent of GDP in Slovenia (compared to 45 percent of GDP in the euro-zone). Credit to households as a percentage of GDP was between 10 percent (Romania) and 36 percent (Slovenia) compared to 54 percent in the euro-zone.

Chart 14. Structure of Bank Loans to the Private Sector (% of GDP, 2001-2006)



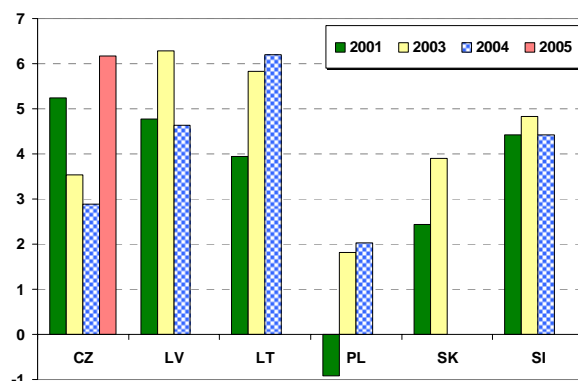
Source: national central banks.

The relatively small increase in bank loans to the corporate sector in the Visegrad countries is mainly due to a considerable improvement in corporate earnings and accumulation of liquid funds in recent years (Chart 15). Internal funds remain the major source of financing for firms of all sizes, and better business performance naturally limits borrowing needs (see also Box 1).

Moreover, in addition to domestic credit, enterprises have access to external lending and inter-company loans (Chart 16), which in some countries constitute a significant part of gross external debt (exceeding 50% of it in the Czech Republic and Bulgaria). In half of the observed countries (Poland, the Czech Republic, Slovakia, Bulgaria and Estonia), the foreign debt stock of enterprises exceeded the level of their domestic bank loans.

Among other reasons for the comparatively modest pace of bank lending growth to the corporate sector in the region (except for the Baltic countries and Slovenia) are inadequate corporate bankruptcy procedures (see the World Bank's Doing Business 2007), opacity of information on enterprises (especially SMEs), and a more selective approach to corporate lending. Nevertheless, in all EU8+2 countries the financial sector infrastructure has also been significantly strengthened (including credit bureaus and corporate and collateral registries), the use of the International Financial Reporting Standards (IFRS) generalized, and auditing now subject to International Standards on Auditing (ISAs) enabling banks to make more informed credit decisions. In addition, creditor rights have been strengthened (see the Doing Business indicators -[www.doingbusiness.org](http://www.doingbusiness.org)).

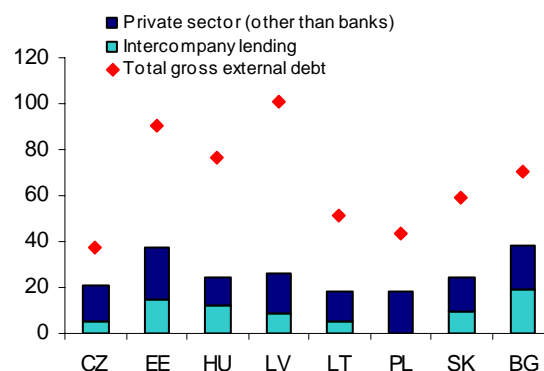
**Chart 15. Net Disposable Income of the Corporate sector (% of GDP, 2001-2005)**



Note: Net disposable income of corporations is equal to gross disposable income minus consumption of fixed capital.

Source: AMECO database.

**Chart 16. Gross External Debt of Enterprises (% of GDP, 2005)**



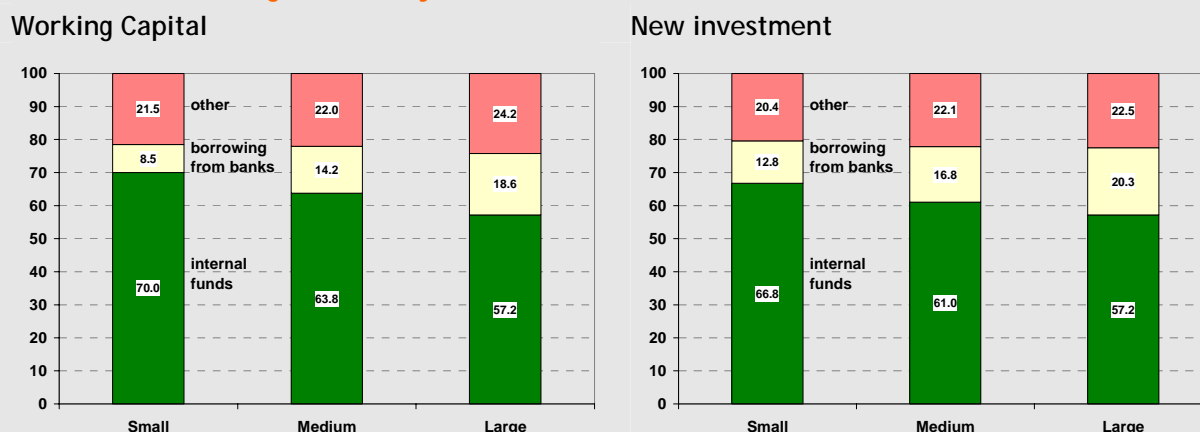
Source: national central banks.

The relatively slow expansion of corporate sector lending in most countries raises questions about the productive impact of the observed credit growth. The strong increase in loans to households has resulted partly from the stagnation in corporate lending - it forced banks to re-orient their services towards households. Obviously, households have fewer financing options than corporations: when household savings are insufficient for bigger expenses, informal borrowing is in fact the only alternative to bank borrowing. Households also benefited from growing competitive pressure among banks (easing loan terms, conditions, and credit standards) and the development of bank loan distribution channels (Pruski and Żochowski, 2006).

### Box 1. Bank Financing to Enterprises (based on BEEPS 2005)

Availability of adequate funding is particularly important for small- and medium-sized enterprises (SMEs). As central banks across the region do not provide detailed data on the structure of bank lending to the corporate sector, we used data from the joint EBRD-World Bank Business Environment and Enterprise Performance Survey (BEEPS). The survey conducted in 2005 covered 3900 firms from EU8+2 countries. The results confirm existing hypotheses that SMEs are more constrained in their financing options than large firms. Hence, they rely more frequently on internal funds/retained earnings than large firms in financing both their working capital and new investments (Chart 17)

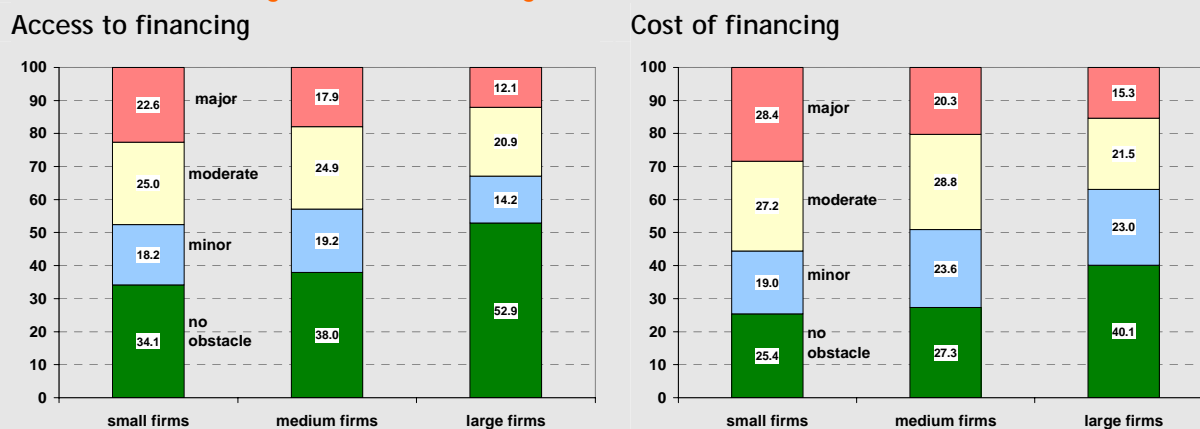
**Chart 17. Financing sources by firm size in the EU8+2**



Note: Small firms are defined as those employing less than 50 full-time employees, medium-size firms employ from 50 to 249, and large firms employ 250 and more. The category “other” covers, inter alia, equity, trade loans, borrowing from family and leasing.  
 Source: BEEPS 2005.

Moreover, SMEs complain much more frequently about access to and cost of financing as a significant obstacle to doing business. Access to financing is indicated as a moderate or major obstacle for around 50% of small firms surveyed, while it is problematic for only around 1/3 of large firms. As far as cost of financing is concerned, the proportions are 56% and 37%, respectively (Chart 18).

**Chart 18. Financing obstacles to doing business in the EU8+2**



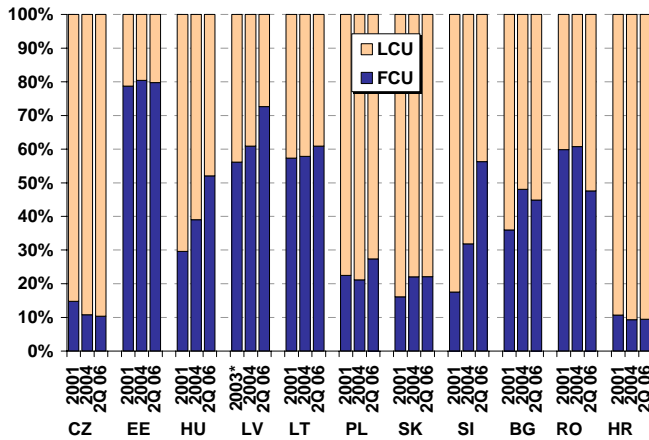
Source: BEEPS 2005.

Foreign currency exposure is expanding quickly on the back of uncovered interest rate differentials and stable or appreciating exchange rates. In some countries, notably the Baltic countries and Hungary, the share of foreign currency-denominated loans increased substantially in recent years (Chart 19). In the household sector, the share of loans denominated in foreign currencies is similar to (Estonia, Latvia, Hungary) or lower than (the Czech Republic, Slovakia, Slovenia, Bulgaria, Romania, Croatia) the private sector as a whole (Chart 19). Only in Poland is this share higher, but overall foreign currency lending is moderate. These loans are mainly in euros, but currencies like Swiss Francs and Japanese Yens are very popular in Hungary and

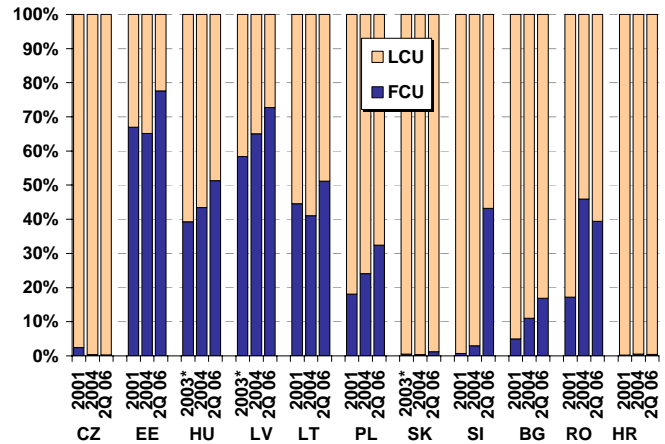
Poland.<sup>11</sup> In the non-Visegrad countries, private sector exposure in non-euro currencies is moderate.

Chart 19. Share of Foreign Currency Denominated (FCU) Bank Loans (% , 2001-2006)

In loans to the private sector



In loans to households



Source: national central banks; and staff calculations.

### 3.2. Drivers of credit growth

The rapid credit growth observed in the EU8+2 countries has been driven by a combination of macro- and microeconomic factors affecting both demand and supply (see Box 2 for a summary of empirical studies). *The demand for credit* has grown because of the transaction motive (increases in disposable income, rising income expectations and higher confidence related partly to EU accession), falling inflation and interest rates, a stable (if pegged) or appreciating trend of local currencies (encouraging foreign currency borrowing), better investment opportunities, and possibly some speculative demand. (EU accession also fueled expectations of property prices increases). In some countries, the demand for credit has also been stimulated by foreign interests investing and borrowing in the region (such as the acquisition of real estate assets by Russian investors in the Baltic countries). In Poland, demand for real estate financing was stimulated by demographic factors - the entry of the 1970s/1980s population boom generation into the labor and real estate markets.

The increased *supply of bank loans* has been driven primarily by financial sector deregulation and deepening. The large privatizations in the banking sector in the mid- or late 1990s (Hungary, Poland, and the Baltic countries) and early 2000s (the Czech Republic, Slovakia, Croatia, and Bulgaria) and public sector retrenchment from banking had a large impact on bank's lending capacity. Increased competition among banks (as a result of foreign entry into the market to capture market share) led to narrowing margins and higher credit growth to maintain profitability.

Specific government schemes may also have contributed to some of the observed credit growth. These would include construction saving subsidies (in the Czech Republic and Hungary) interest rate subsidies (in Hungary), favorable tax treatment for housing loans and government bail-out guarantees (implicit or explicit). For instance, in Estonia, mortgage finance has been stimulated by guarantees available from KredEX, the government credit and export fund, and the deductibility of mortgage interest.

<sup>11</sup> In Poland, at the end of 2005 35% of housing loans to households were denominated in Polish Zloty, 8% in euro and the remaining 57% in other currencies (like CHF, USD or JPY etc).

## Box 2. Drivers of Credit Growth in Emerging Europe - Summary of Recent Studies

It is still an open question whether the recent credit boom observed in several countries in the region reflects a sustained financial deepening or can be already regarded as excessive (too fast confronted with fundamentals), contributing to macroeconomic imbalances and deterioration of bank asset quality.

Empirical studies investigating credit expansion concentrate mostly on high-income industrialized countries, while the literature on credit growth in CEE countries is fairly limited. In the empirical literature on credit growth in the NMS, several recent studies have dealt with lending booms, exploring their stylized features, driving forces, macroeconomic effects and possible policy implications. In these studies, the emphasis has been on the identification of the “boom” component: trying to distinguish between equilibrium movements in credit (trend deepening of financial sector, normal cyclical pattern and some fundamental macroeconomic variables) and a potentially dangerous credit boom (excessive growth of credit demand and/or supply).

There seems to be no clear consensus in the empirical literature regarding the broad assessment of credit growth to the private sector in the NMS. Some empirical findings show that current credit-to-GDP ratios in the region are in line with or even well below the level that fundamentals would justify. In contrast, other point to excessive credit expansion. However, their common finding is that demand factors (e.g. income, interest rate and inflation) are the main drivers of credit growth, although supply factors (financial liberalization indices, banking regulation, accounting standards), if robust, may increase the reliability of the estimation results.

Keeping in mind different approaches, time periods, country and topic focuses, Schadler et al (2004), Cotarelli et al (2003), and Brzoza-Brzezina (2005) consider the current trend to be a benign scenario of catching up, with a largely remote possibility of a downward correction. The importance of the catching-up is also highlighted by Kiss et al (2005). Their results suggest that a large part of the credit growth in non-Baltic states can be explained by their catching-up process and that actual credit/GDP ratios are below the levels consistent with macroeconomic fundamentals.

On the other hand, others find that current credit growth in a number of countries in the region cannot be fully explained by rapid economic growth, declining interest rates or the catch-up in incomes, and they see possible stability issues. In particular, excessive credit expansion have been found by Backé et al (2005) in Estonia, Latvia, Croatia and Bulgaria, Boissay et al (2006) in Bulgaria, Latvia and to a lesser extent Lithuania, Estonia, Hungary, and Croatia, Kiss et al (2005) in Estonia and Latvia and Duenwald et al (2005) in Bulgaria and Romania.

Empirical work on credit growth also provides evidence on the role of bank soundness as a factor driving credit growth (Dell’Ariccia, Detragiache, and Rajan, 2005; and Fabrizio et al, 2006). The latter study suggests that rapid credit growth in the NMS has not weakened banks significantly so far, but it has recently become independent of bank soundness. However, prudential risks are most apparent in lending to households or in foreign currency and in the Baltic countries, where weaker banks are found to be expanding at a faster rate.

The results of our own empirical analysis confirm the statistical significance of several factors discussed in the literature. We constructed several panel regression models using quarterly data from the EU8+2 countries and Croatia and the time range 2000 - Q2-2006 (Annex 1). We asked ourselves the following questions: Did the sensitivity of credit demand to changes

in growth rates reflect a wealth effect (i.e. is a higher propensity to borrow resulting from better current financial conditions and improved income prospects)? What was the impact of nominal interest rate convergence on bank credit? Was the crowding-out (crowding-in) effect of public sector balances observable? Did banks intensify their lending activity due to a higher degree of financial liberalization? In most cases, we found sufficient empirical evidence that the answers to those questions were positive. Moreover, we found that the statistical significance of key credit drivers differed among country groups. This suggests that credit trends are much more synchronized within smaller sub-regions than in the region as a whole.

### 3.3. Funding and market risks connected with the credit expansion

Recently, banks in the region have been increasingly looking for external financing as credit demand has surpassed deposit accumulation (Chart 20). In mid-2006, deposits were still higher than credits in the Visegrad countries (except Hungary) and Bulgaria. Foreign funds, including intra-group borrowing across borders, are gaining importance as a financing source in almost all countries in the region (except Poland and the Czech Republic), but mainly in the Baltic countries, Slovakia and Bulgaria (Chart 21).

Chart 20. Bank Credit-to-Deposit Ratio

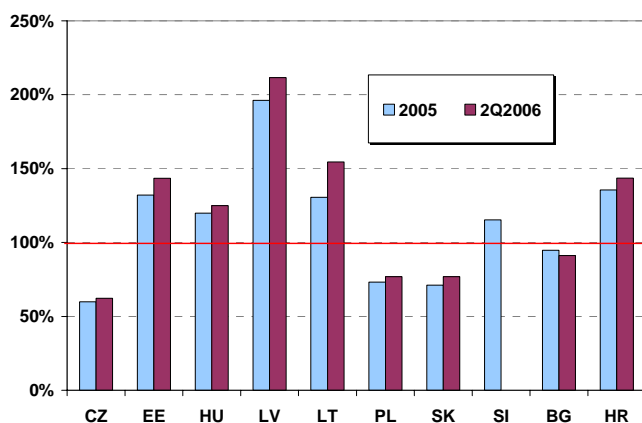
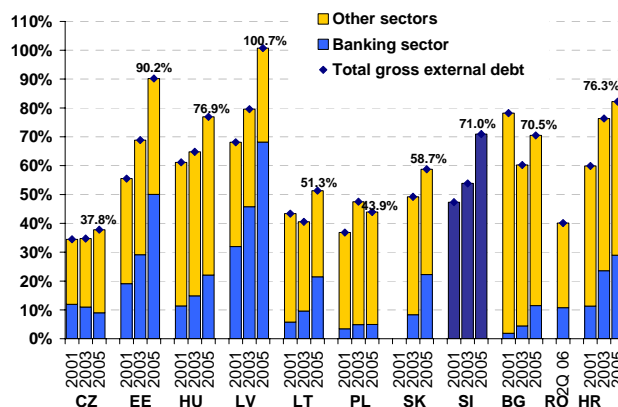


Chart 21. Gross External Debt of the Banking Sector and Total Gross External Debt (% of GDP, 2001-2005)



Note: For Slovenia only total gross external debt is available.

Source: national central banks; and staff calculations.

The strong growth of household loans translated into an increased share of long term loans in bank portfolios and into widening term mismatches. Naturally, banks as financial intermediaries face term mismatches as short-term (or demand) deposits dominate on the liability side (Table 1) while assets are usually long-term (Table 2). With a rising share of long term loans (including housing), banks' have taken on increasing liquidity risks.

**Table 1. Maturity Structure of Bank Deposits (% , 2005-06)**

|                              | CZ   |      | EE   |      | HU   |      | LV   |      | LT   |      | PL*  |      | SK   |      | SI   |      | BG*  |      | RO   |      | HR   |      |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                              | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 2Q06 | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 |
| less than 1Y (incl. current) | 85.3 | 85.9 | 97.2 | 97.0 | 95.2 | 91.0 | 92.1 | 92.8 | 90.2 | 89.7 | 39.9 | 42.2 | 85.9 | 86.8 | 86.2 | 86.6 | 84.7 | 85.3 | -    | -    | 59.9 | 60.0 |
| more than 1Y                 | 14.7 | 14.1 | 2.8  | 3.0  | 4.8  | 9.0  | 7.9  | 7.2  | 9.8  | 10.3 | 60.1 | 57.8 | 14.1 | 13.2 | 13.8 | 13.4 | 15.3 | 14.7 | -    | -    | 40.1 | 40.0 |

Note: For Poland, deposits less than one year include only current deposits and more than one year include all term deposits; for Bulgaria deposits are less than 2 years and more than 2 years.

**Table 2. Maturity Structure of Bank Loans (% , 2005-06)**

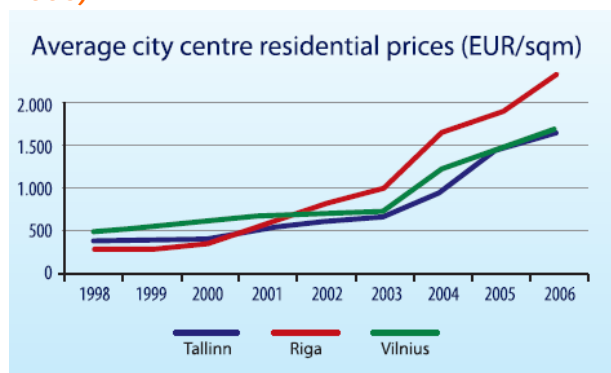
|              | CZ   |      | EE   |      | HU   |      | LV   |      | LT   |      | PL   |      | SK   |      | SI   |      | BG   |      | RO   |      | HR   |      |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|              | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 | 2005 | 3Q06 |
| less than 1Y | 25.7 | 24.9 | 8.8  | 9.3  | 26.7 | 26.2 | 13.6 | 12.6 | 17.4 | 15.3 | 27.2 | 25.2 | 31.5 | 31.3 | 47.1 | na   | 23.1 | 29.6 | 37.5 | 34.3 | 20.7 | 21.7 |
| 1-5Y         | 22.9 | 20.2 | 22.2 | 21.9 | 26.5 | 24.8 | 35.7 | 34.8 | 29.1 | 29.8 | 27.9 | 27.0 | 23.1 | 21.2 | na   | na   | 40.8 | 30.7 | 36.7 | 29.3 | 10.3 | 9.2  |
| more than 5Y | 51.5 | 54.9 | 69.0 | 68.8 | 46.8 | 49.0 | 50.7 | 52.5 | 53.5 | 54.9 | 44.8 | 47.8 | 45.4 | 47.5 | 52.9 | na   | 36.1 | 39.7 | 25.8 | 36.5 | 69.0 | 69.1 |

Note: For Croatia, medium-term loans are less than 3 years and long-term loans more than 3 years.

Source: national central banks; and staff calculations.

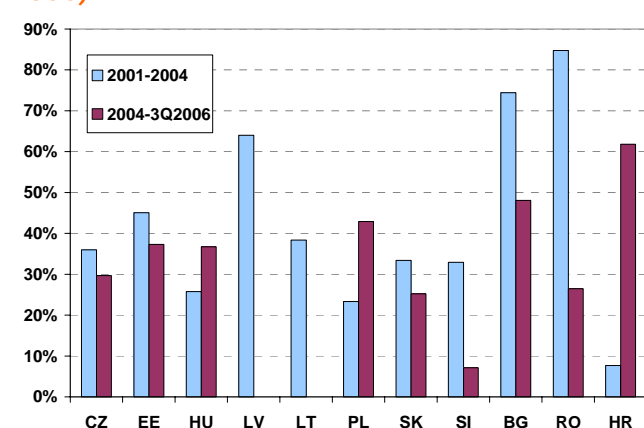
With credit growth in the region to a large extent fueled by housing loans, concerns have surfaced about potential asset bubbles and broader macroeconomic risks. It is generally recognized that, while housing loans have contributed to a sustained increase in the demand for real estate assets, the supply of real estate assets has not increased much in the EU8+2 countries. As a result, housing prices have experienced rapid growth and generated fear of a potential housing market bubble, especially in the Baltic countries (Chart 22). Also, with an increased role of housing as collateral, household spending has become more dependent on housing prices.<sup>12</sup> The rapid growth in household lending may also have contributed to the stock market boom although it is difficult to quantify to what extent (Chart 23).<sup>13</sup>

**Chart 22. Average City Center Residential Prices in the Baltic States (EUR/sqm, 1998-2006)**



Source: Real Estate Market Report 2006.

**Chart 23. Average Annualized Stock Exchange Index Growth (% , 2001-2004 and 2004 - Q2-2006)**



Source: national stock exchanges; and staff calculations.

Furthermore, the significant share of foreign currency denominated loans in bank lending to the household sector creates unhedged exposure that could precipitate loan quality

<sup>12</sup> However, the collapse of real estate prices during the Swedish crisis of the early 1990s and the UK real estate crisis of the late 1980s did not translate into significant increases in NPLs.

<sup>13</sup> In countries, in which the IPOs was a popular method of privatization in recent years, private persons frequently used bank leverage in order to circumvent over-biddings (Poland).

problems in the case of currency swings. Because of the historical stability of many domestic currencies, the exchange rate risk is generally perceived as limited. However, there is a growing unhedged exposure. Moreover, the rising proportion of foreign currency loans in bank assets translates into lower efficacy of interest rates as a monetary policy instrument. While there is little information on hedging activities of enterprises and households, the relatively low demand for derivative products would suggest that it is only taking place on a small scale (Sebastian, 2005).

#### 4. Financial and Macroeconomic Vulnerabilities

In the previous section we presented clear evidence that the magnitude of credit growth (and financial vulnerabilities linked to excessive bank lending) vary significantly across the EU8+2 countries. The Baltic countries and recent newcomers to the EU (Bulgaria and Romania) are experiencing a significantly faster credit increase than the other countries in the region and suffer from more severe macroeconomic imbalances.<sup>14</sup> This does not imply that risks are not pertinent for the remaining countries, as many of them face strong or accelerating credit growth. Slovenia, which joined the euro-zone from January 2007, probably enjoys the best protection against any potential financial distress.

Rapid credit growth has often been considered risky in itself, because during the boom even weaker private sector units may be judged creditworthy. Euphoria-led credit booms have indeed often led banks to increasingly focus and reassign staff to credit generation to the detriment of credit monitoring and risk appraisal. As a result, insufficient selectivity among projects or borrowers during credit booms has frequently been associated with eventual deterioration of asset quality reflected in increases in non-performing loans (NPLs). This fact indicates an urgent need for vigilance regarding banks' financial performance and risks both by bank management (and owners) and by banking supervision agencies.

##### 4.1. Health of the banking sector and quality of banking supervision

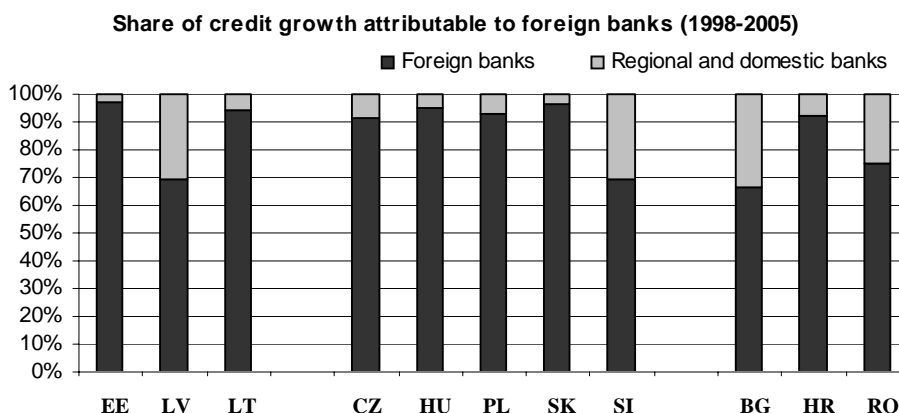
###### *The role of foreign banks*

In most countries, with the exception of the Czech Republic, Hungary, Romania and Bulgaria, foreign bank credit has been growing faster than domestic bank credit. In all EU8+2 countries, the majority of new credit issued since 1998 (85 percent on average) has been originated by foreign banks (Chart 24). This is perceived as a source of comfort for supervisors as foreign banks are deemed to have better tools and processes for assessing and monitoring credit risks, as well as having deeper pockets to cope with possible shocks which should moderate the fiscal cost of any bank crisis.

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<sup>14</sup> For very different (fiscal) reasons, Hungary can also be regarded as a financially vulnerable country.

**Chart 24. Share of Credit Growth Attributable to Foreign Banks in the EU8+2 Countries (% , 1998-2005)**



Source: staff calculations based on Bankscope data.

Despite obvious advantages such as transfer of know-how, the presence of foreign banks is not all reassuring. *Firstly*, despite the deep pockets of these banks' mother companies, the extent to which they would come to the rescue of their eastern European subsidiaries remains unclear. For most of these foreign banks, these subsidiaries represent a small share of their assets and the mother company may not wish to invest more capital in them in the event of a regional crisis. *Secondly*, the large presence of foreign banks exposes these countries to higher contagion risks. Difficulties in the banking sector of one mother bank's country could affect its subsidiaries and, reciprocally, problems in a one host country could trigger a withdrawal by foreign banks from other countries in the region.<sup>15</sup> *Thirdly*, rapid credit growth by foreign banks with sophisticated credit assessment models may lead to the formation of a dual banking system in which they "cherry-pick" low risk deals and borrowers while others (mostly domestic banks) are left with risky business.

#### *Capital adequacy and bank profitability*

An analysis of the current financial health of banks in the EU8+2 countries suggests that generally the banks are well-capitalized and enjoy robust profitability. Capital adequacy ratios (CARs) are well above the Basle minimum of 8%, though they have been falling in all of the EU8+2 countries as credit expanded (Chart 25). The decreasing (but still safe) CARs have thus gone hand in hand with rising profitability of banks as expressed in the ROE (with the exception of Slovakia and Romania - Chart 26) and ROA (with the exception of Slovakia, Romania, Lithuania and Bulgaria - Chart 27).

<sup>15</sup> The Japanese banks did so during the Asian crisis.

Chart 25. Capital Adequacy Ratio (%)

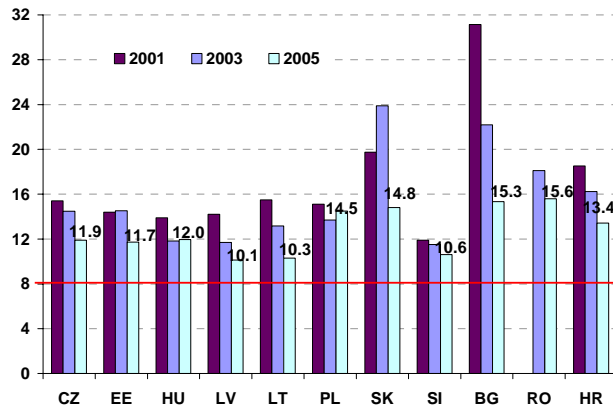
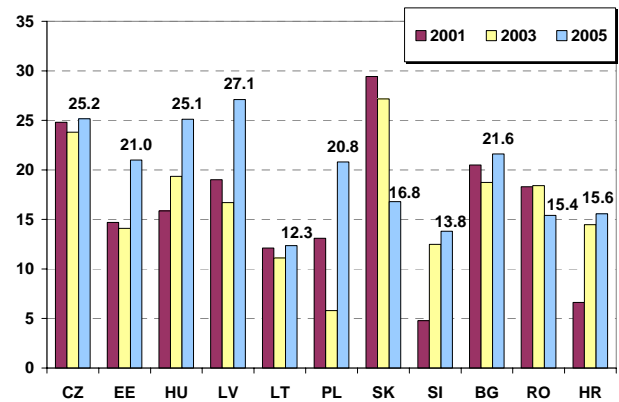


Chart 26. Return on Equity (%)

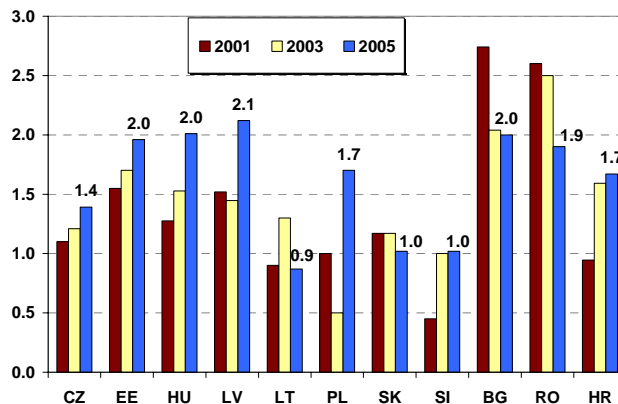


Note: For the Czech Republic, Slovakia, Estonia, Lithuania, and Romania, the first bar refers to 2002.

Source: national central banks.

There has been a visible improvement in the quality of bank credit portfolios since the end of the 1990s, as shown by the reduction in the ratio of NPLs to total loans (Chart 28). The overall improvement is partly the mathematical result of the expansion of loan volumes (higher denominator) and some write-offs of irregular loans (lower numerator), but also the result of concrete improvements such as the introduction of more stringent credit underwriting standards, improved risk management and capital allocation policies, and the adoption of international accounting standards (all stimulated by the entry of foreign banks and the alignment of regulatory and supervisory practices with EU directives).

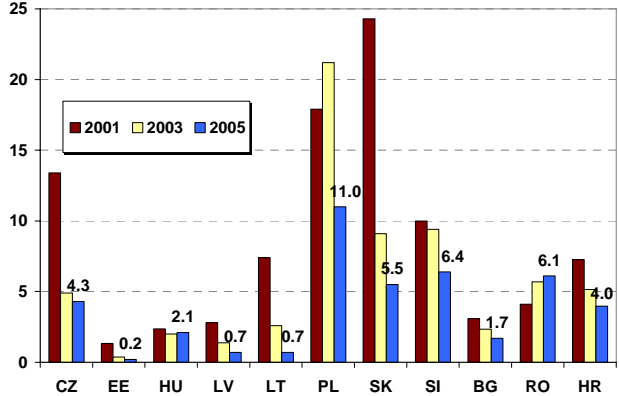
Chart 27. Return on Assets (%)



Note: For the Czech Republic, Slovakia, Estonia, Lithuania, and Romania, the first bar refers to 2002.

Source: national central banks.

Chart 28. Non-Performing Loan Ratio (%)



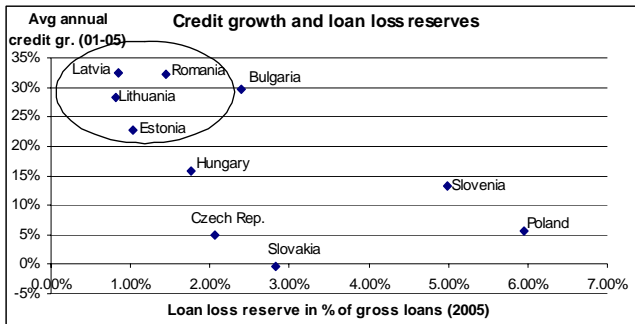
Note: For Hungary and Bulgaria, the first bar refers to 2002.

Source: national central banks; EBRD (for Lithuania, Slovakia, Slovenia and Romania).

Banks in the countries with the fastest credit growth are well-capitalized or have robust asset quality. Banks in Romania and Bulgaria have the highest capital adequacy ratios in the region, while the Baltic States the lowest ones (but comfortably above 8%). Proxied by the

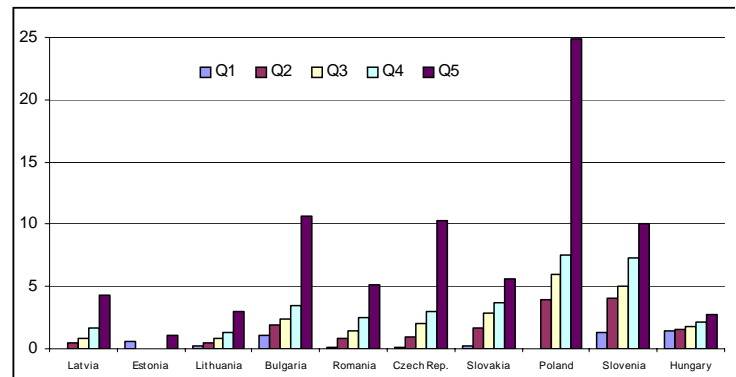
loan-to-reserves ratio from the *Bankscope* data, the Baltic countries have the lowest NPL,<sup>16</sup> followed by Romania (Chart 29). Lithuania had the lowest median level of loan loss reserves in 2005. An analysis of the distribution of loan loss reserve ratios by quintiles reveals that, while all banks in the Baltic countries seem to have levels of loan loss provisions below 5 percent of gross loans, some banks in Bulgaria, the Czech Republic, Poland and Slovenia have significantly higher levels of bad loan provisions (Chart 30).

Chart 29. Credit Growth (average 2001-2005) and Loan Loss Reserves (2005)



Source: BankScope.

Chart 30. Distribution by Quintiles of Loan Loss Reserve Ratios (2005)



Three factors undercut the reassuring nature of this conclusion. *Firstly*, low levels of NPLs today do not mean that current credit portfolios are not at risk of future sharp increases in NPLs. So far, the stress tests performed by the Central Banks tend to conclude that banks are overall resilient in the event of a sudden increase in NPLs, but at the same time stress tests highlight potential stability issues (see Box 3 and Annex 2.) *Secondly*, in contrast to the late 1990s, the pace of credit growth since 2001 is no longer dependent on bank soundness, with weaker banks expanding credit as rapidly as sounder banks (Fabrizio et al, 2006). This absence of correlation between bank soundness and credit growth seems to be the highest in household lending. Potential credit quality problems at weaker banks are likely to materialize in financial soundness indicators with a lag, unless the banks strengthen their risk management practices. *Thirdly*, another element of vulnerability lies in the rise in foreign exchange denominated loans and in maturity mismatches on banks' balance sheets (Section 3.2 above).

### Box 3. Stress Test Results in Selected EU8+2 Countries

Stress testing, in the context of financial sector surveillance, refers to a range of techniques to help assess the vulnerability of a financial system to exceptional but plausible events (see Financial Stability Assessment Program (FSAP): *a Handbook*).

The Central Banks in the EU8+2 countries have adopted various approaches to stress testing, involving credit, interest rate, exchange rate and contagion shocks individually or under broader scenarios, expressing the effect as a percentage of bank capital adequacy, assets or profitability. Not all CBs make these results available to the public for stability concerns, although typically some conclusions may be found in their Financial Stability Reports (FSR). Annex 2 provides a broad overview of the reported stress test results in selected emerging European countries.

<sup>16</sup> Note that the practices to require reimbursement of real estate loans covered by collateral before they become non-performing may lead to an artificially low level of NPLs in the Baltic countries.

Overall, the tests lead to the conclusion that the banking sector as a whole is resilient to macroeconomic and prudential shocks, with some banks showing greater sensitivity. However, some clear weaknesses are apparent from the tests. Some affect a few selected banks only. For instance, in Poland, the tests highlight that the CAR of one (small) bank falls below 8% in all stress scenarios. In Slovakia, stress tests highlight that credit risk could be a stability concern under the current fast lending growth in case of a strong deterioration in asset quality. Also, while the Latvian stress tests report no significant problems in absorbing a three-fold expansion of NPLs (with NPLs amounting to only 0.5 percent of total loans at the end of June 2006), a 5 percentage point increase in NPLs would result in CARs below 8% in banks representing nearly 50 percent of total assets (see details in Annex 2).

#### *Quality of financial/banking supervision*

Banking sector legal, regulatory and supervisory frameworks have improved significantly in all the EU8+2 countries. The Financial Sector Assessment Programs (FSAP) conducted by the IMF and the World Bank in these countries have generally concluded that compliance with the Basle Core Principles (BCPs) was high. In general, supervisory structures are strong, enjoying adequate independence and staffing, supervisors have adequate legal protection and supervision methods are increasingly risk-based. Regulatory forbearance is infrequent and enforcement is generally consistent. While a driving factor for many of these changes has been the need to harmonize with EU standards, it also reflects the authorities' strong commitment in all these countries to creating a well-functioning and well-supervised financial system.

Nevertheless, some minor issues remain. They however do not hamper supervisors' abilities to perform their responsibilities. They include the need for further progress in integrating supervision (for those countries such as Slovakia that have integrated their supervisory agencies) and ensuring adequate supervision of banks that will be using their own internal credit models under Basle II.

However, the lack of adequate cooperation between home and host supervisory bodies means that supervisors in home countries are not fully aware of the risks posed by their subsidiaries, while host country supervisors are not fully aware of the health of foreign bank entities in their countries. Memorandums of understanding, when they exist, are rarely complemented by reciprocal visits and sharing of information. The issue will become even more important under Basle II, where the challenge for national supervisors will be to ensure that they maintain an effective role regarding supervision of banks which are systemically important in their country despite their use of mother company internal credit risk models.

#### 4.2. Macroeconomic vulnerabilities and how the current situation might play out

##### *Macroeconomic developments and vulnerabilities*

The very rapid credit growth experienced by several of the emerging European countries has had important macroeconomic consequences. The sharp increase in domestic demand, especially household consumption stimulated by rapid real income growth and high consumer confidence about future growth (Chart 31-Chart 39 and Table 3) has spurred strong real GDP growth in the region since 2000, reaching an annual average of over 5 percent during the period 2000-2005, but also contributed to the emergence of large macroeconomic imbalances in some countries. Output growth has been particularly rapid in the Baltic States at around 10% in recent years.

Strong inflationary pressures have emerged in some countries raising concern about overheating. While inflation has generally been declining in most of the region, averaging about 4 percent in 2005, inflationary pressures have been mounting in the Baltic countries and Bulgaria from 2004 delaying prospect for rapid euro adoption. This rise reflects both exogenous

and internal factors, including adjustments of administered prices and indirect taxes (especially in Bulgaria), rising food and energy prices, and rapid wage and credit growth.<sup>17</sup> Asset prices, especially real estate prices, have surged in these countries creating fears of asset price bubbles. In addition, real exchange rates have appreciated and real interest rates have declined to low or in some cases even negative levels.<sup>18</sup>

The domestic demand boom has led to a surge in imports and large current account deficits, especially in the Baltic and Southeastern European countries. Imports were also affected by the sharp increase in oil prices as emerging European countries are all largely dependent on oil imports. In contrast, the share of exports in GDP grew much less in general. Overall, while investments increased, savings increased much less, leading to large current account deficits, especially in the Baltic and Southern European countries where they reach over 10 percent of GDP.<sup>19</sup> Only the Czech Republic, Poland and Slovenia in the region have maintained low current account deficits.

Both FDI and capital inflows have contributed to financing the current account deficits. In the Baltic countries (and to some degree Romania), foreign borrowing by banks has played an important role in financing the current account deficits and external debt levels have increased sharply. Thus, while the external debt-to-GDP ratios have remained more or less stable in the Central and Southeastern European countries (at between 40 and 60 percent of GDP), it has been rising sharply in the Baltic countries, especially in Estonia and Latvia where it reached about 80 percent of GDP in 2005. Rising external debt has been associated with increasing currency and maturity mismatches. Short-term external debt over total external debt is above 40 percent in Lithuania, Latvia and Slovakia and exceeds foreign exchange reserves by a sizeable margin in Estonia and Lithuania.

Fiscal policies have tended to be pro-cyclical and fiscal consolidation in the Visegrad countries has been slow. The Visegrad countries are all running budget deficits, albeit relatively small (except in Hungary where it reached about 10 percent of GDP in 2006). Bulgaria and Estonia are running small surpluses and Latvia, Lithuania and Romania small deficits. Most countries have not taken adequate advantage of the recent strong growth to consolidate public finances and have tended to run pro-cyclical fiscal policies. Furthermore, implicit public sector liabilities have been accumulating in several of these countries as a result of unfunded social security systems.

In conclusion, in spite of the remarkable economic performance of the emerging European countries overall, macroeconomic imbalances are widespread in the region in the form of inflationary pressures, appreciating real effective exchange rates, large external deficits, currency and maturity mismatches, and exposure to global shocks. In the Visegrad countries, credit growth has been more moderate and private sector driven imbalances smaller.

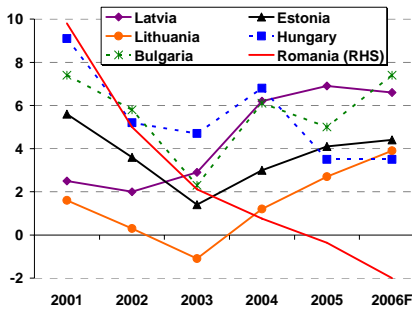
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<sup>17</sup> The labor markets in these countries are tightening with a decline in unemployment and labor migration leading to skills shortages and bottlenecks.

<sup>18</sup> Real exchange rate appreciation is in part explained by the large inflows of foreign direct investments (FDI) to the region attracted by lower labor costs, good infrastructure and prospects of becoming an outsourced manufacturing or service hub for Western Europe. While real appreciation is in part driven by fundamentals (including the Balassa-Samuelson effect), there is concern that in some countries the pace may have been excessive and exceeding any equilibrium real exchange rate appreciation.

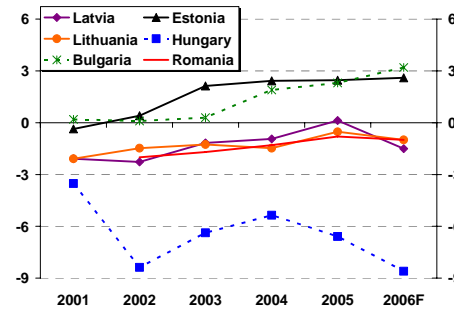
<sup>19</sup> This trend is mostly the result of private sector savings and investment imbalances rather than public sector imbalances except in Hungary (see main report).

Chart 31. Inflation (HICP), y/y, %



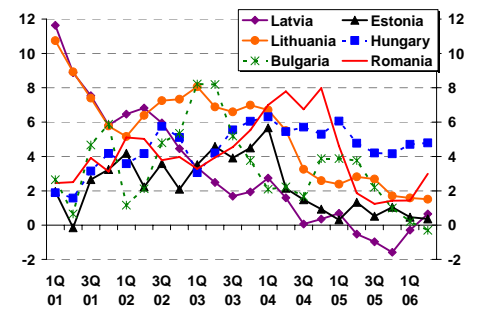
Source: Eurostat; for 2006 - forecasts from the recent Convergence Programs.

Chart 32. Fiscal Balance (ESA'95), % of GDP



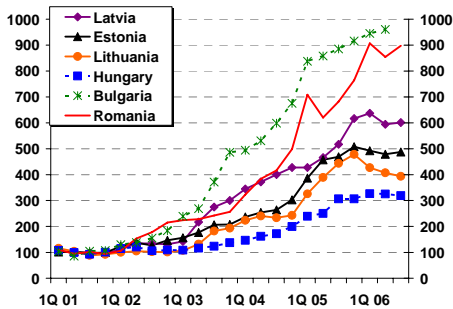
Source: Eurostat; for 2006 - forecasts from the recent Convergence Programs.

Chart 33. Real Short-Term Interest Rates, deflated ex post by CPI



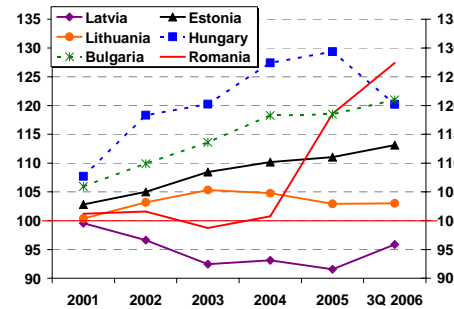
Source: Eurostat.

Chart 34. Share Price Index, year average 2001 = 100



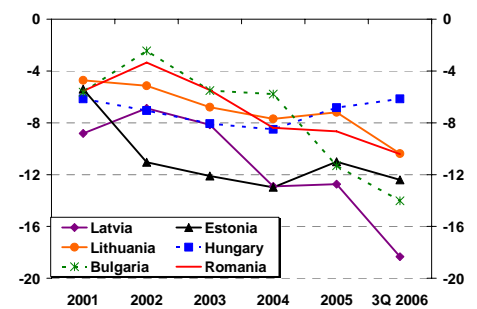
Source: national stock exchanges; ISI.

Chart 35. Real Effective Exchange Rate, deflated by CPI, year 2000 = 100



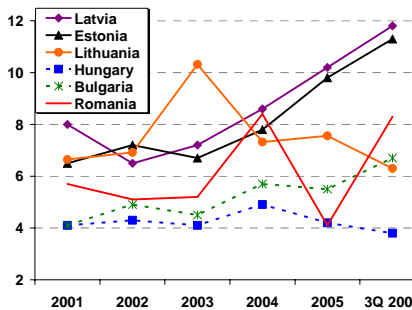
Source: European Commission (ECFIN).

Chart 36. Current Account, % of GDP



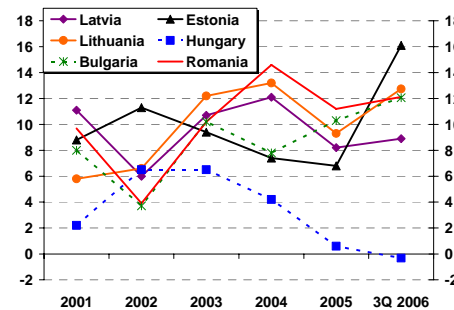
Source: national central banks.

Chart 37. Real GDP Growth, y/y, %



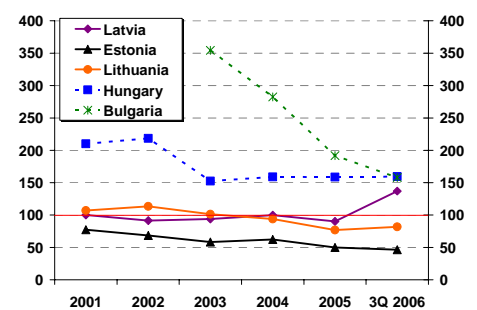
Source: Eurostat; national CSOs.

Chart 38. Domestic Demand Growth, y/y, %



Note: For LV - Q2-06.  
Source: Eurostat; national CSOs; staff estimates (RO in Q3-06).

Chart 39. Foreign Currency Reserves-to-Foreign Short-Term Debt ratio, %



Source: national central banks (data on short-term foreign debt in Romania is not available).

**Table 3. Selected Vulnerability Indicators (Q3-2006)**

|  | CZ            | EE                    | HU       | LT                    | LV                    | PL            | SI    | SK                      | BG             | RO               | HR               |
|--|---------------|-----------------------|----------|-----------------------|-----------------------|---------------|-------|-------------------------|----------------|------------------|------------------|
| GDP growth, SNA (real, %, yoy)   | 5.8           | 11.3                  | 3.8      | 6.3                   | 11.8                  | 5.8           | 5.6   | 9.8                     | 6.7            | 8.3              | 4.7              |
| Domestic Demand, (real, %, yoy)  | 5.5           | 16.1                  | -0.3     | 8.9                   |                       | 6.1           | 6.5   | 9.2                     | 12.1           |                  | 7.1              |
| Current account balance, (4Q cumulative, % of GDP)                             | -3.7          | -12.4                 | -6.2     | -10.4                 | -18.3                 | -1.9          | -2.8  | -10.4                   | -14.0          | -10.4            | -8.2             |
| REER index (2000 = 100, HICP-based, increase = appreciation)                   | 127.4         | 113.1                 | 120.2    | 95.9                  | 103.0                 | 102.8         | 103.8 | 140.3                   | 121.0          | 127.4            | 87.7             |
| FDI (4Q cumulative, % of GDP)  | 3.7           | 1.5                   | 6.0      | 2.1                   | 5.9                   | 2.8           | 0.8   | 6.6                     | 14.8           | 7.2              | 5.2              |
| Total gross external debt (eop, % of GDP)                                      | 36.8          | 92.9                  | 91.7     | 56.3                  | 112.0                 | 47.3          | 76.5  | 54.2                    | 77.5           | 27.4             | 82.4             |
| Change of international reserves in euro (eop, relative to previous period, %) | 1.6           | 12.7                  | -0.5     | 4.1                   | 18.8                  | 4.1           | -5.1  | -15.1                   | 7.3            | 2.1              | -7.0             |
| Reserves-to-short-term debt ratio (eop, %)                                     | 189.8         | 46.5                  | 159.4    | 81.8                  | 137.0                 | 149.9         | 222.4 | 207.5                   | 157.9          | #DIV/0!          | 224.4            |
| Money Supply-to-Reserves ratio (eop, %)  | 285.7         | 331.4                 | 272.5    | 277.7                 | 138.2                 | 297.0         | 190.2 | 142.8                   | 179.2          | 86.1             | 294.0            |
| Credit to private sector (eop, % of GDP)                                       | 38.2          | 79.8                  | 55.6     | 47.2                  | 80.8                  | 31.7          | 63.2  | 37.7                    | 44.5           | 24.7             | 68.0             |
| Growth rate of credit to the private sector (avg, %)                           | 19.4          | 34.0                  | 24.8     | 55.2                  | 61.1                  | 20.5          | 26.6  | 21.9                    | 23.6           | 55.0             | 22.4             |
| Foreign currency loans to the private sector (eop, % of loans to priv. sect.)  | 10.3          | 78.1                  | 51.9     | 55.6                  | 74.4                  | 27.3          | 57.4  | 19.6                    | 45.1           | 46.9             | 9.2              |
| Short-term (3M) interest rates spreads to euro area (avg, basis points)        | -84.0         | 8.0                   | 407.0    | 4.0                   | 156.0                 | 98.0          | 25.0  | 171.0                   | 18.0           | 529.0            |                  |
| Change of stock exchange index (avg, relative to previous period, %)           | -0.5          | 1.7                   | -2.1     | -3.3                  | 1.1                   | 5.6           | 9.1   | -1.9                    | 1.6*           | 5.0              | 19.0             |
| Exchange Rate Regime   | Free Floating | ERM 2, Currency board | Floating | ERM 2, Currency board | ERM 2, Currency board | Free Floating | EMU   | ERM 2, Managed Floating | Currency Board | Managed Floating | Managed Floating |

Source: staff calculations.

### *Similarities with previous episodes of credit booms (and busts)*

Recent financial/asset market and macroeconomic developments in the most vulnerable emerging European countries have many similarities with previous episodes of credit booms (and busts). The Asian countries prior to the 1997 crisis, Sweden and Finland prior to the crises in the early 1990s, and Portugal prior to euro adoption and the sharp slowdown in growth in the early 2000s all went through a period of financial market liberalization, rapid credit growth in part financed through foreign capital inflows, accelerating domestic demand, rising inflation and asset market prices, declining real interest rates, appreciating real exchange rates, and widening external imbalances (see charts in Annex 3). All countries also pursued prudent fiscal policies in the context of fixed exchange rate regimes. As is well known, these developments culminated in financial crises in both Asia and the Scandinavian countries, in part triggered by external shocks and in the case of Asia exacerbated by severe contagion. In Portugal, the adjustment was more gradual and less painful, but the subsequent decline in domestic demand as income expectations were realigned nevertheless contributed to a severe economic slowdown.

However, there are also important differences with these episodes. In Asia, capital inflows tended to be of a short term and speculative nature, banking systems were generally weak and connected lending widespread, and levels of credit in relation to GDP were significantly higher than in the emerging European countries. In the Scandinavian countries, there was limited experience with the operation of liberalized financial markets, but it is noteworthy that the crises there took place on the background of only modest private sector credit levels at around 50-55% of GDP.

Furthermore, banking systems in the EU8+2 are well-capitalized and non-performing loans remain low. Moreover, the quality and transparency of banking sector statistics and the experience of international institutions and domestic financial supervision agencies is much richer than 10-15 years ago. Presumably, credit rating agencies have learned lessons from past experience and evaluate the risks more effectively. In addition, in the EU8+2 there is much less evidence of the moral hazard and connected lending problems that were prevalent in the Asian crisis.

A key distinguishing feature of the NMS is EU membership and the prospects of euro adoption. However, it is hard to evaluate to what extent institutional integration at this level is likely to protect countries effectively against financial problems. Membership in the ERM2

(the Baltic States and Slovakia) may provide some comfort although no assurance against financial market distress as the history of the exchange rate mechanism demonstrates. Membership in the EMU such as achieved by Slovenia from January 2007 clearly offers the best protection. The expectations of rapid euro adoption have created a strong sense of security among investors so far, but risks would increase in the event of distant euro adoption prospects.

#### *How the current situation might play out*

The most positive scenario - "catching up with old Europe" - would be a continuation of recent trends for the foreseeable future, with rapid credit expansion and strong capital inflows financing productive investments and supporting continued strong productivity and output growth. There are indeed several legitimate reasons behind the rapid credit growth observed in the region. Financial deepening is a natural phenomenon in transition countries, resulting generally from higher economic activity and better economic prospects, as well as the parallel sophistication of the banking system. Privatization, public sector retrenchment, the liberalization of the real estate market and other legal and regulatory improvements are often also key factors behind the rapid rise of bank loans to the private sector in transition economies. Current account deficits may be financed without problems for an extended period of time, similar to the case of e.g. Singapore in the 1960-80s.

However, such a scenario is questionable in the most vulnerable countries in the region for a number of reasons. In Singapore, the growing current account deficits were accompanied by significant increases in savings, while savings have been stagnant in most of the emerging European countries. There is also some doubt about the extent to which capital inflows have been associated with productive investments and transfer of technology in the region. In several countries, FDI has been concentrated in the non-tradable sectors and there are some signs of weakened competitiveness in the tradable sectors in the context of an increasingly competitive global market.

A repeat of Portugal's experience may be more likely in these countries in the absence of more proactive policy responses. The rise in aggregate demand that sustains economic growth could slow down rapidly under various external shocks, including an oil price shock, a sharp slow down in Western Europe, and continued higher ECB interest rates, leading to adjustments in expectations about future income prospects. Export growth could also decelerate sharply with continued real appreciation of currencies, enhanced global competition, and weaker growth in key markets. As in Portugal, governments in the most vulnerable emerging European countries would have few policy instruments to stimulate demand, and growth could slow sharply with economies potentially falling into a prolonged recession. Similar to Portugal, however, healthy banking sectors may be able to cope with such a scenario.

The risks of an outright financial crisis followed by a prolonged recession and large fiscal costs seem small at this point in time. Nevertheless, a Scandinavian type boom-bust scenario cannot be ruled out completely, and the situation could be aggravated by some degree of contagion although unlikely to the same degree as was the case in Asia. Latvia is also vulnerable to sudden withdrawal of large non-resident deposits as happened in Uruguay in 2001.

#### **Box 4. Portugal's Credit Boom and Subsequent Recession**

Portugal experienced high demand-led growth rates from 1995 to 2000 driven by rapid credit expansion to households (household debt surged from 13 percent of GDP in 1990 to 61 percent of GDP in 2000 fueled by the strong decline in interest rates based on accession to the EMU, financial liberalization, and increased innovation and competition in the financial sector). Demand growth was also spurred by strong real wage increases (resulting from a tightening of

the labor market and wage increases led by the public sector), a steady rise in permanent income expectations, a decline in the household saving rate and an increase in investment activity (particularly residential construction).

However, high domestic demand in Portugal was not matched by corresponding increases in domestic supply, with the economy near full employment and economic activity shifting to non-tradable sectors. A weakening of productivity growth combined with strong domestic demand led to rising inflation, real currency appreciation, and large external imbalances. These developments, alongside other factors including a sharp correction in asset markets, eventually led to a sharp slowdown in growth from 2001 and recession in 2003 from which the economy is only slowly recovering. ECB's higher interest rate policy from 1999 to 2001 was perhaps the turning point exposing the country's macroeconomic imbalances. The slowdown in international trade, weaker euro area growth and the continuing weakness of the Brazilian economy where Portuguese firms were highly exposed, led to a reassessment of household expectations, lower domestic demand and weakening investment activity. As fiscal policy until 2001 had been primarily expansionary, the correction subsequently required exacerbated the downturn.

## 5. Conclusions and Policy Implications

Banking sector credit has been expanding at very high rates in several of the EU8+2 countries, especially in the last couple of years. Lending to households, in particular for housing, has been growing particularly fast in most of the countries. While this to a significant extent reflects a normal catching-up process by previously underdeveloped financial systems and credit to the private sector as a share of GDP remains relatively low and in line with per capita incomes in the region, some countries in the region have witnessed a true credit boom that has contributed to surging consumption and overheating of the economies with strong inflationary pressures, skyrocketing asset markets, and large current account deficits. This is particularly the case in the three Baltic States and the Southern European countries.

International experience suggests that prolonged, rapid credit growth coupled with macroeconomic imbalances can easily deteriorate into financial distress. In fact, the most vulnerable of the EU8+2 countries share several characteristics with countries that experienced such crises in recent times, including Sweden and Finland in the early 1990s and Asia in the late 1990s. In both cases, rapid credit growth in the context of fixed or rigid exchange rate regimes was associated with booming asset markets, real appreciation of currencies, deteriorating external positions, and eventual collapse of output growth as lenders and investors lost confidence and pulled out.

There are however greater similarities with Portugal in the run-up to euro adoption in the second half of the 1990s, which escaped a banking and financial crisis but nevertheless experienced a sharp macroeconomic adjustment.

While banking systems generally remain healthy and banking supervision has improved significantly, credit quality may be deteriorating and the rapid rise in foreign currency lending to households is associated with additional credit risks. Furthermore, it seems that less sound banks are equally engaged in new lending and may be taking even higher risks. It may be some source of comfort that a large share of the banking system in most countries is foreign owned, although there is no guarantee that parent banks would come to the rescue in case of trouble. Banks in the region are also not engaged to the same degree in connected lending as was the case in Asia or Mexico, which was a key factor exacerbating the problems there.

It is difficult to judge how the current episode of rapid credit expansion in the region will play out and it is likely to be different from country to country. Generally sound banking systems suggest that there may be little reason to worry excessively, but does not warrant

complacency, especially in countries where credit is booming and macroeconomic vulnerabilities are significant. In these countries, there is a real risk that excessive real appreciation will undermine external sustainability and fixed exchange rate regimes, and that parent banks may eventually become increasingly reluctant to increase their exposure to NMS subsidiaries. This could result in an abrupt and severe adjustment process. Countries in the region also remain exposed to potential external shocks and are hardly immune from contagion risks.

Much will depend on how the situation is managed, both at the macro and micro levels. A proactive policy response is needed ranging from enhanced supervision and possibly regulation to more hard-hitting measures aimed at slowing excessive credit growth, including tightening of monetary (where possible) and fiscal policies aimed at stimulating private savings.

With regard to prudential and supervisory tightening, the primary objective should be to strengthen the health of the banking system. In general, particular attention should be paid in all countries to risk-based supervision, cross-border supervision and home-host cooperation, information disclosure by banks and companies, and strengthening of banks' risk management capacity. These measures are generally recognized as having the best impact on the quality of banks' balance sheets and areas where FSAPs have indicated that some Emerging European countries still have some weaknesses. Close inspection and periodic stress testing of individual banks are crucial.

However, it should be noted that such tightening of regulatory efforts also has potential downsides. It could potentially introduce competitiveness imbalances among financial sector players (e.g. foreign vs. domestic banks), or even reroute financing to less supervised channels (e.g. leasing companies or foreign banks switching from subsidiaries to branches). Such efforts by supervisory authorities could be complemented by strong communication on the risks associated with rapid credit growth.

Stronger and more targeted regulatory measures might be considered in countries with higher potential risk. The instruments traditionally put forward include increases in capital adequacy ratios and the introduction of dynamic provisioning<sup>20</sup> to dampen the cyclical fluctuations of lending activity. However, the former are not effective when Capital Adequacy Ratios (CARs) are above legal limits (as in all the Emerging European Countries) and dynamic provisioning tends to decrease transparency of true asset quality. Alternative instruments include tighter loan classification and provisioning rules, stricter assessment of collateral, higher risk weights for certain type of lending, and the establishment of minimum standards for borrowers.

Increases in reserve requirement rates have also been used, but their long term impact has generally proven limited at best. If they become too high, they are likely to result in shifts to direct lending from abroad or from non-bank financial institutions (NBFIs). Widening the reserve requirement base to include all liabilities, relevant off-balance sheet items and NBFIs, while maintaining a single rate (to avoid misclassification) has led to better results than increases in reserve requirement rates. Imposing minimum liquidity ratios is also likely to have limited impact, as foreign banks will probably satisfy them without an effect on credit expansion. Another possible last resort policy response would be to apply temporary foreign exchange restrictions to moderate foreign banks' credit expansion or limits on banks open market positions. This, however, could only be considered in case of severe tensions and in agreement with the EU.

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<sup>20</sup> Spain has had dynamic provisioning since 2000. Dynamic provisioning addresses credit risk during credit boom periods by smoothing loan-loss provisioning over the economic cycle. As credit growth and loan portfolio quality exhibit strong cyclical fluctuations, dynamic provisioning uses historical experience to recognize that credit losses can be properly accounted and provisioned for in a statistical sense as soon as the risk (or the incurred loss) appears in the balance sheet.

Administrative measures, such as credit ceilings, are also temporary and last resort measures, usually with distortionary effects, and they should thus generally be reserved to cases of excessive credit growth materializing in higher NPLs. Among the most likely distortionary effects of individual bank credit growth control are rerouting of financing to other asset categories or other financial intermediaries, a reduction in banking sector data transparency and an increase in direct borrowing from abroad. Finally, if the limits are not risk-based, they effectively punish the stronger institutions for risks taken by weaker banks.

Table 4 summarizes the policy responses that have been used by countries in Eastern and Western Europe to respond to past or current credit growth pressures. It is clear that many countries have been concerned about excessive credit growth and have taken a number of measures to control this. However, their effectiveness is unclear as credit generally continued growing rapidly and macroeconomic imbalances remained large. It is noteworthy that none of the countries have enforced strict loan- or payment-to-income ratios in credit decisions.

In general, stricter domestic prudential regulations than elsewhere in the EU may easily be evaded by booking loans offshore. Moreover, with the introduction of Basel 2, all EU members will be expected to implement uniformly the EU Capital Requirements Directive, leaving little room for stricter national implementation of the Directive, including in the areas of risk weighting of mortgages and loan-to-value rules.

Measures to enhance the availability and quality of corporate sector information would also help facilitate a better monitoring of borrowers' health by banks and the authorities. Coupled with other measures to stimulate corporate sector lending in countries where it has remained limited (especially the Central Eastern European countries) through improvements in the business environment for instance, such measures could also have a positive impact on aggregate supply, exports and economic growth. This however should take place alongside policies to strengthen banks' ability to assess and monitor the creditworthiness of customers outside the traditional banking relationships, such as SMEs, where little prior experience exists.

In countries characterized by significant macroeconomic vulnerabilities, a macroeconomic response is called for. On the monetary policy front, even putting aside the constraints under a fixed exchange rate regime, the openness of financial markets suggests that traditional monetary policies might be limited or even unproductive. Monetary tightening may divert borrowing abroad, increasing foreign currency borrowing and risk taking. Fiscal policy has a potentially more important role in restraining aggregate demand. In particular, countries should avoid pro-cyclical fiscal policies. Measures aimed at discouraging household borrowing and stimulating savings may be particularly effective. In countries where housing lending is rapid and associated with concerns about a property market bubble, financing limits or less generous tax treatment of mortgage interest may be considered. A comprehensive real estate tax could also be applied. Consumer lending could be discouraged through a tax on interest payments on consumer credit. The Danish "Potato Diet" of October 1986, which came on the back of a credit-financed consumption boom, overheating, and current account problems, introduced a 20% tax on interest payments on consumer credit, reduced tax credit for interest payments on mortgage debt, and tightening of regulations regarding consumer and mortgage credit. Combined with the follow-up tax reform of 1987, this led to a sharp rise in real after tax interest rates, a severe adjustment in the housing market, a sharp slowdown of consumption and output growth, and a much improved current account balance.

Finally, authorities should prepare themselves for the unlikely, but not impossible scenario of an overt financial distress scenario. This means that adequate contingency plans need to be in place, defining in details responsibilities and restructuring methods should banks be intervened. Ideally, if the capacity of the authorities to implement such contingency plans has not been proven yet by real life cases, drills should be performed. In the case of a banking crisis, the authorities are likely to face significant problems in home-host co-operation given

the large presence of foreign banks in the region. Many host countries have already tried to address such potential problems by signing Memorandums of Understanding (MoUs) with home countries, but these are only first steps in co-operation and information sharing; they are usually not legally binding and do not address the underlying conflicts of interest. Furthermore, the quality of insolvency systems, creditor rights and debt restructuring mechanisms will also come to the forefront under a crisis. Doing Business indicators suggest that much still needs to be done in this field and that countries could enhance enormously these areas of prompt resolution and recovery in anticipation of bad times.

In conclusion, a balanced approach between supporting rapid convergence and ensuring its sustainability and limiting risks required. Given the lessons learned from previous episodes of financial distress, it is clear that prudence should dominate the “growth versus imbalance” policy dilemma that many of the emerging European countries face today. To that end, sound macroeconomic policies are key, while initial closer inspection, forward-looking analysis and stress testing, and better home-host cooperation and contingency planning could suffice in most countries to monitor risks in the banking sector. A rise in NPLs should be a trigger to implement stronger measures along the lines discussed above. In countries where the credit boom has led to overheating, a more determined fiscal policy response aimed at stimulating private savings is warranted. In all countries, longer term policies to promote labor market flexibility and enhance the business environment and thus divert high credit growth to the productive sector instead of household consumption would also be advisable.

**Table 4. Policy Responses to Rapid Credit Growth**

| Countries | Central Bank Actions   |
|-----------|--|
| Bosnia    | Tightened bank core capital requirements; tightened reserve requirements (foreign currency in the base; exclusion of vault cash from eligibility); reduced remuneration of excess reserves at the central bank; tightened foreign exposure regulations; strengthened application of bank liquidity regulations.  |
| Bulgaria  | Tightened fiscal stance; restricted conditions for current profits to be included in regulatory capital; tightened reserve requirements (by excluding the vault cash in eligible assets and broadening the liability base subject to RR by including deposits and securities with longer term maturity and repos); introduced marginal reserve requirements for banks exceeding certain rate of credit growth; tightened loan classification and provisioning requirements; increased the frequency and focus of on-site inspections; strengthened information on retail lending conditions.   |
| Croatia   | Tightened moderately fiscal stance and interest rates; introduced charges for market risk into capital adequacy calculation; required rapidly growing banks to meet higher capital adequacy standards or be subject to mandatory retention of a portion of profits; introduced penalties for banks with high lending growth; increased required FX coverage of banks' FX liabilities; introduced additional reserve requirements for banks with rapidly growing portfolios (with exemption if they met higher capital standards); introduced marginal reserve requirement on foreign borrowing; introduced monitoring of bank customers' FX risk during on-site inspections; reorganized CB's banking supervision department to operate on risk basis; unified supervision of NBFIs. |
| Estonia   | Increased risk weighting in the capital adequacy calculation of all loans secured by mortgages on residential property; required credit institutions to include half of the total loan amount secured by mortgages on residential property in the reserve requirement base calculation (unless the appropriate regulator applies a 100% risk weighting in the analogous calculation of capital adequacy); restricted reserve requirements by the inclusion of foreign bank liabilities on gross basis and abolishment of vault cash deductibility; limited mortgage interest deductibility.  |
| Greece    | Imposed non-remunerated deposits for an amount equivalent to credit growth above specified rates; increased monitoring of credit management processes and stress testing, public disclosure and coordination among supervisory agencies.   |
| Latvia    | Raised reserve requirements.   |
| Moldova   | Required reserves for FX deposits to be held in FX; required banks to have separate risk management units.   |
| Poland    | Adjusted CAR for foreign exchange risk; required banks to strengthen risk management and internal controls; credit registry/wider information base/APR disclosure requirements.  |
| Portugal  | Tightened rules governing general provisions, large exposures, connected lending and capital adequacy; increased capital requirements for housing loans with loans-to-value ratios exceeding 75% and tightened provisioning requirements for consumer loans; strengthened reporting requirements relating to risk management, and increased monitoring and coordination among supervisory agencies.  |
| Romania   | Tightened fiscal and monetary stance; introduced limits on foreign currency credit as percent of capital; increased mandatory reserve requirement on banks' foreign currency denominated liabilities; extended the reserve base for required reserves on foreign exchange deposits; lowered the reserve ratio on domestic currency deposits; applied stricter loan classification rules; tightened eligibility for consumer and mortgage loans; limited insurance companies' exposure to bank loans; established credit bureau; postponed permitting leu deposits by nonresidents.   |
| Serbia    | Increased capital adequacy ratio; raised reserve requirement for foreign currency deposits; broadened reserve base to include commercial banks' foreign borrowing; tightened conditions for bank consumer loans; started regulating and supervising leasing companies.   |
| Spain     | Introduced dynamic provisioning and monitored forward looking indicators related to housing credit.  |
| Ukraine   | Raised minimum capital adequacy ratio; reduced the eligible amount of vault cash in reserve requirements; strengthened loan classification rules; tightened related-party lending regulations (by set-aside capital); strengthened bank inspection based on risk assessment; strengthened creditor rights; established NBFIs regulator.  |

*Sources: Central Bank Annual Reports; and World Bank staff.*

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## ANNEX 1. EMPIRICAL RESULTS FROM A CROSS-COUNTRY PANEL REGRESSION MODEL

Our panel regression models were estimated based on quarterly data from 2000 Q1 to 2006 Q2 for 11 countries (EU8+2 and Croatia). The panel of 11 economies is also subdivided into 3 presumably more homogeneous groups: (1) Visegrad countries (2); the Baltic 3 (B-3); Baltic countries and Romania, Bulgaria and Croatia (the SEE). The changes in private credit as a percent of GDP ( $d\_credit\_toGDP$ ) were regressed on four major demand and supply variables used in previous studies (see Box 2): (i) real GDP growth ( $gdp\_growth$ ); (ii) nominal short-term interest rate ( $lend\_rate$ ); (iii) change in bank credit to the government sector as a percent of GDP ( $d\_cregov\_gdp$ ); and (vi) degree of liberalization of the financial sector, expressed by spreads between lending and deposit rates ( $spread$ ). Our baseline specification also includes a dummy variable ( $eu$ ) for EU accession effect (equal to one from the 2nd quarter 2004 and onwards for the EU8 countries, and zero otherwise).

Overall, the results presented in Table 5 confirm that both demand and supply factors have an important influence on private sector credit growth in the EU8+2 and Croatia. Our main findings are:

- An increase in real GDP results in an acceleration of the credit to the private sector in the region (although the relation is less robust for Visegrad countries). Vigorous economic growth enables private agents to support higher levels of indebtedness and, consequently, to finance higher consumption and investments through credit. In addition, the coefficient on lagged income growth is significantly positive in all our specifications (eq.4-7); indicating that strong growth leads to higher expected future income and demand for bank credit.
- There is a reasonably robust empirical support for the negative relationship between the demand for loans and their cost. The link weakens when a time trend is included in the regression, as the time trend, among other things, is likely to capture downward movement in interest rates in the region.
- There is evidence of crowding-in of private sector credit as a consequence of shrinking net public borrowing in the domestic banking sector. This is because of privatization proceeds or balanced budgets (or even budget surpluses) in some countries, and development of alternative financing options in countries with fiscal deficits (Treasury bond issues on domestic and international markets). The crowding-in phenomenon seems to be most effective in the case of Visegrad countries. It is not apparent in case of Baltic countries, due to their relatively low debt and deficits.
- The financial liberalization variable, measured by the spread between lending and deposit rates, has the expected negative sign but is less robust, when the nominal interest rates are included in the regression. An explanation for this may be that the declining trend in both variables - the spreads and nominal interest rates - may result from some common factors such as decreasing global interest rates.
- Finally, the time trend variable is generally significant and positive indicating that, *ceteris paribus*, the private credit ratio is increasing in line with the catching-up process. This variable captures lots of time-specific tendencies such as intensified competition in the banking sector or increases in bank willingness to lend. The latter factor is not a measurable concept, while proxies used in literature to represent it (including the risk-weighted capital ratio of the banking system, non-performing loans and operating costs as a percentage of total assets) are not available on quarterly basis.

Table 5. Panel Model for Private Sector Credit

|                            | EU8+2 countries  |                  |                  |                  |                  |                  |                  | Visegrad_c       | Baltic_c         | Baltic&SEE       |
|----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
|                            | 1 (base)         | 2                | 3                | 4                | 5                | 6                | 7                | 8                | 9                | 10               |
| <b>gdp_growth</b>          | <b>0.127***</b>  | <b>0.083**</b>   | <b>0.088***</b>  | <b>0.135***</b>  | <b>0.145***</b>  | <b>0.191***</b>  | <b>0.215***</b>  | 0.211            | 0.195***         | 0.223***         |
| t-value                    | 3.23             | 2.44             | 2.7              | 3.78             | 4.24             | 4.73             | 5.5              | 1.22             | 3.03             | 4.71             |
| <b>lend_rate</b>           | <b>-0.250***</b> | <b>-0.051**</b>  | <b>-0.066***</b> | <b>-0.112**</b>  | <b>-0.198***</b> | <b>-0.155***</b> |                  | <b>-0.240**</b>  | <b>-0.393***</b> | <b>-0.263***</b> |
| t-value                    | -12.79           | -2.09            | -2.78            | -2.5             | -7.02            | -3.54            |                  | -2.16            | -4.57            | -10.35           |
| <b>d_cregov_gdp</b>        | <b>-0.336***</b> | <b>-0.336***</b> | <b>-0.335***</b> | <b>-0.372***</b> | <b>-0.381***</b> | <b>-0.378***</b> | <b>-0.371***</b> | <b>-0.397***</b> | 0.162            | -0.053           |
| t-value                    | -9.28            | -9.52            | -9.73            | -10.88           | -11.44           | -10.38           | -10.13           | -7.07            | 1.58             | -0.72            |
| <b>eu</b>                  | <b>1.104**</b>   | <b>-0.358</b>    |                  | <b>0.926*</b>    | <b>0.920*</b>    | <b>1.607***</b>  | <b>1.707***</b>  | 0.21             | <b>4.278***</b>  | <b>4.095***</b>  |
| t-value                    | 2.04             | 0.86             |                  | 1.87             | 1.85             | 3.24             | 3.71             | 0.33             | 7.12             | 6.21             |
| <b>lgdp_growth</b>         |                  |                  |                  | <b>0.184***</b>  | <b>0.197***</b>  | <b>0.237***</b>  | <b>0.242***</b>  |                  |                  |                  |
| t-value                    |                  |                  |                  | 5.33             | 5.98             | 5.97             | 6.23             |                  |                  |                  |
| <b>spread</b>              |                  |                  |                  |                  |                  | <b>-0.144*</b>   | <b>-0.338***</b> |                  |                  |                  |
| t-value                    |                  |                  |                  |                  |                  | -1.57            | -5.34            |                  |                  |                  |
| <b>llend_rate</b>          |                  |                  |                  | <b>-0.103***</b> |                  |                  |                  |                  |                  |                  |
| t-value                    |                  |                  |                  | -2.73            |                  |                  |                  |                  |                  |                  |
| <b>trend</b>               |                  | <b>0.327***</b>  | <b>0.301***</b>  |                  |                  |                  |                  |                  |                  |                  |
| t-value                    |                  | 10.32            | 10.08            |                  |                  |                  |                  |                  |                  |                  |
| <b>Observations</b>        | 275              | 275              | 275              | 264              | 264              | 264              | 264              | 100              | 75               | 150              |
| <b>Number of countries</b> | 11               | 11               | 11               | 11               | 11               | 11               | 11               | 4                | 3                | 6                |

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1% (eq. 6; spread significant at 15%\*)

Note:

Estimation method : Cross-sectional time-series FGLS regression with country-specific effect

Panels: heteroskedastic with cross-sectional correlation

Correlation: panel-specific AR(1)

Source: staff calculations

## ANNEX 2: SELECTED STRESS TESTING PRACTICES AND RESULTS 2005/2006

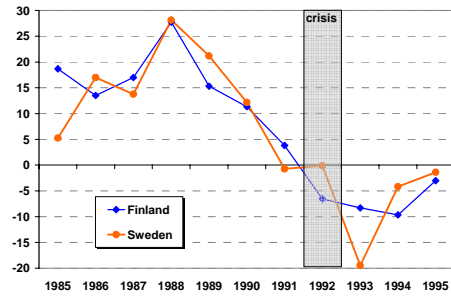
| Shocks Examined   | Results Reported  |
|---|---|
| <i>Czech Republic (FSR, 2005)</i>   |   |
| <p>Stress tests measure the impact on Capital Adequacy Ratio (CAR) of various shocks:</p> <p>A. Basic stress tests based on 2 scenarios: (i) Scenario I: increase in interest rates of 1 percentage point, depreciation of the exchange rate of 15% and increase in the share of NPLs of 30% by reclassification of loans, (ii) Scenario II: increase in interest rates of 2 percentage points, depreciation of 20% and increase in the share of NPLs in total loans of 3 percentage points.</p> <p>B. Maximum interest rate shock which the banking sector as a whole can absorb.</p> <p>C. Impacts of contagion in the interbank market in the event of a bank's capital inadequacy.</p> <p>D. Other tests based on results from the macroeconomic forecasting model and the credit risk model.</p> | <p>-The resulting post-test CAR of the banking sector is above 8%, except in one test, which, however, was based on relatively extreme assumptions.</p> <p>-Some banks show greater sensitivity to interest rates and interbank contagion risks.</p> <p>-The banking sector is capable of withstanding the stress of shocks, including movements in exchange rates.</p>                               |
| <i>Hungary (FSR 2006)</i>   |   |
| <p>The 2003 Financial Stability Report (FSR) present various stress tests measuring the impact on CAR of interest, exchange rate and credit risk shocks. Subsequent FSRs only report one "stress CAR" in a scenario where all NPLs are written off.</p>   | <p>The banking sector's "stress CAR" declined during 2005, but that of the ten largest banks improved.</p>  |
| <i>Latvia (FSR, 2006)</i>   |   |
| <p>The FSR reports on the impact on CAR of gradual NPL increases, in the domestic, external and real estate sectors.</p>  | <p>Banks would have no significant problems in absorbing a potential credit risk increase resulting in a three-fold expansion of NPLs. Specific or sectoral credit risk shocks continue to point to banks' growing exposure to real estate market associated risks, but none of the analyzed shocks would cause bank insolvency.</p>  |
| <i>Lithuania (FSR, 2005)</i>  |   |
| <p>Banks submit the results of individual stress tests with scenarios and methods at their discretion (but including at least credit, market, liquidity and operational risks) to the CB.</p> <p>The CB also performs its own stress tests, measuring the impact on CAR of an increase in specific provisions by 2, 4 and 6 times.</p>  | <p>If specific provisions increase by 2 or 4 times, the overall CAR of the banking system would remain higher than 8 percent.</p> <p>With a 6 time increase, the average ratio would be below 8%.</p>   |
| <i>Poland (FSR, 2006)</i>   |   |
| <p>The stress tests measure the impact of a credit risk shock on CAR under the following 3 scenarios:</p> <p>A. Migration of satisfactory and special mention loans to doubtful loans.</p> <p>B. (i) All claims on non-financial customers from the substandard and doubtful categories are downgraded to the category of loss loans, (ii) a decrease in the value of loan security by 25% and 50%.</p> <p>C. Simultaneous bankruptcy of (i) the sector's three</p>   | <p>- Banks' loan loss absorption capacity decreased in the first half of 2006: the CAR of domestic banks whose assets constitute 1/5 of total assets would fall to 8% under scenario A, compared to 15% in Dec. 2005;</p> <p>- The CAR for one of the banks slid slightly below 8% in all scenarios.</p> <p>-Under C (i) only one bank's CAR would drop below 8% (ii) the majority of banks' CARs</p> |

|  |  |
|--|--|
| largest non-financial borrowers or (ii) the three largest financial sector borrowers.  | would stay above 11.5%.  |
| <i>Romania (FSR, 2006)</i>   |  |
| The stress test measures the impact on CAR of a 18.6 percent depreciation of the domestic currency exchange rate and a 6.7 percentage point decline in interest rate on Leu denominated operations, considering indirect credit risk effects (exposure to companies).  | The average CAR remains high after the shock, at 16.7. On an individual basis, it remains higher than the minimum level of 12 percent, except for one small bank.  |
| <i>Slovenia (FSR, 2006)</i>  |  |
| The stress tests measure the impact on pre-tax profit, return on equity (ROE), CAR, growth in loans and deposits of different shocks:<br>A. Real GDP growth down 2.5 percentage points;<br>B. Tolar interest rates up 4 percentage points, foreign currency interest rates up 2 percentage points;<br>C. Interest margin down 1 percentage point;<br>D. Exchange rate down 5%;<br>E. Exchange rate up 5%.<br>An assessment of credit risk via changes in the quality structure of banks' portfolios is also performed.   | Banks are primarily exposed to interest-rate risk, while exchange-rate risk and the risk of lower economic growth are relatively less important. Attention should be drawn to the shortening of the open foreign exchange position in the corporate sector, which for banks represents a potential increase in credit risk in the event of a depreciation of the Tolar.  |
| <i>Slovakia (FSR, 2005)</i>  |  |
| Stress tests measure the impact on CAR of various shocks:<br>A. Foreign exchange risk: several scenarios based on historically "worst" exchange rate changes;<br>B. Interest rate risk: 3 scenarios representing a parallel move, a change in the short term or long-term rates, and a change in the slope of the interest-rate curve.<br>C. Credit Risk: 2 scenarios based on deterioration in the quality of the credit portfolio, and a fast growth in lending while the structure of loans and the overall risk in their portfolio remains unchanged.<br>D. Liquidity risk: 3 basic scenarios of a large decline in the value of government bonds, a large unexpected withdrawal of client deposits, and a sudden outflow of short-term capital from the banking sector owing to external factors.<br>E. Systemic risk: one scenario based on a matrix of relations between banks, testing the failure of one or several banks and domino effects. | -Extreme changes in exchange or interest rates should not threaten the stability of the banking sector.<br>-Credit risk is a problem for individual banks, and could be a stability concern under the current fast lending growth and assuming deterioration in asset quality.<br>-The simulated decline in the value of government bonds did not have a substantial effect on banks. The sudden withdrawal of 20% of client deposits had a greater effect on large and medium-sized banks and of 90% of foreign bank deposits on certain medium-sized banks and on banks tied in terms of resources to their financial groups.<br>-The crash of one bank threatens the CAR of 2 banks at most, with a spillover unlikely. |

## ANNEX 3: FINANCIAL AND MACROECONOMIC DEVELOPMENTS IN SCANDINAVIA, EAST ASIA AND SELECTED EURO-ZONE COUNTRIES

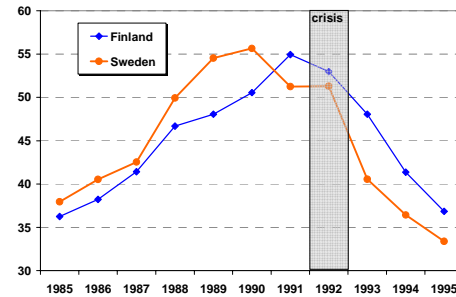
### Sweden and Finland 1985-1995

Chart 40. Credit to the private sector, y/y growth, %



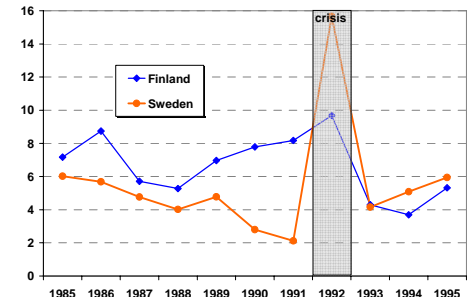
Source: Eurostat.

Chart 41. Credit to the private sector, % of GDP



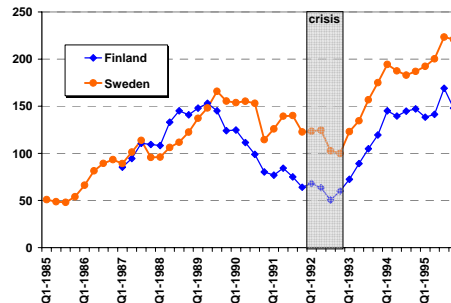
Source: Eurostat.

Chart 42. Real short-term interest rates, deflated ex post by CPI



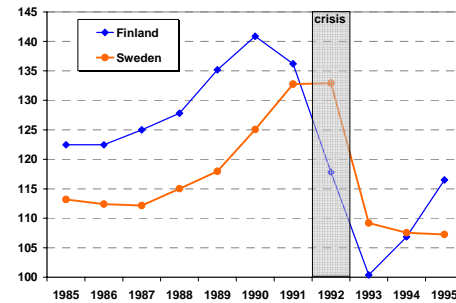
Source: IFS.

Chart 43. Share price index, year average 1997 = 100



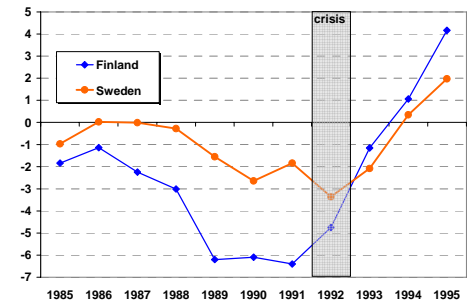
Source: OECD Economic Outlook

Chart 44. Real Effective Exchange Rate, deflated by CPI, year 2000 = 100



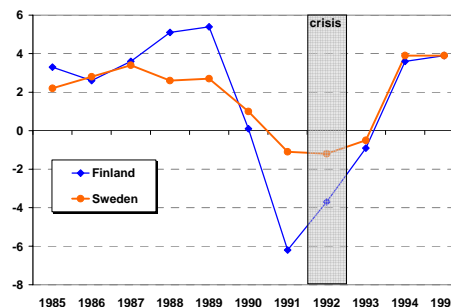
Note: An increase denotes appreciation of local currency. Source: The Economist Intelligence Unit (EIU).

Chart 45. Current account balance, % of GDP



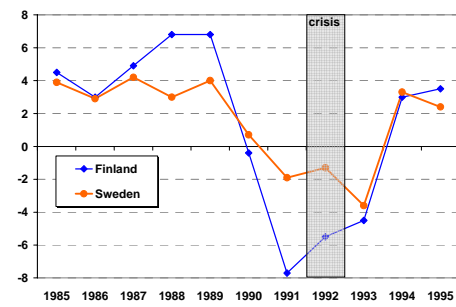
Source: IFS, EIU.

Chart 46. Real GDP growth, y/y, %



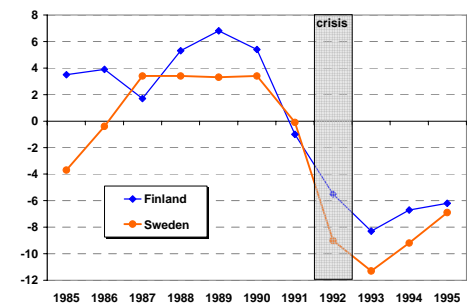
Source: Eurostat.

Chart 47. Domestic demand, y/y, %



Source: Eurostat.

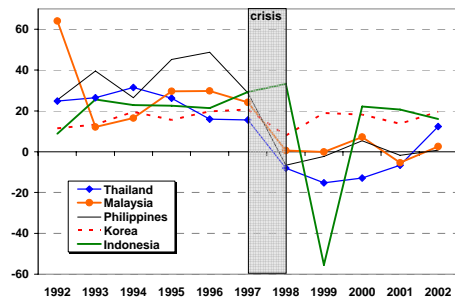
Chart 48. Fiscal balance, % of GDP



Source: IMF World Economic Outlook Database.

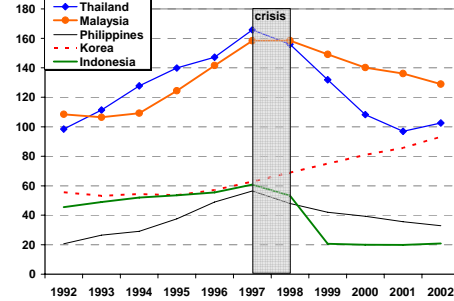
# East Asia 1992-2002

Chart 49. Private credit growth, y/y, %



Source: IFS.

Chart 50. Private credit to GDP ratio, %



Source: IFS.

Chart 51. Real short-term interest rates, deflated *ex post* by CPI

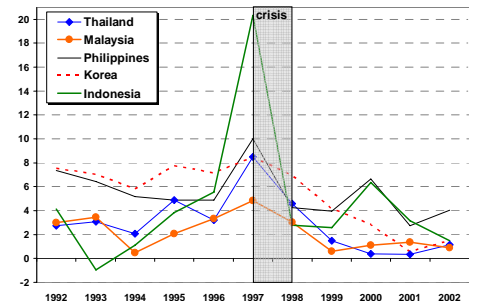
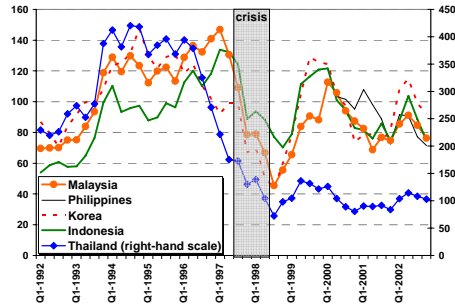
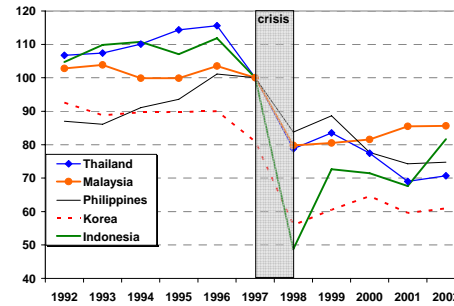


Chart 52. Share price index, year average 2000 = 100



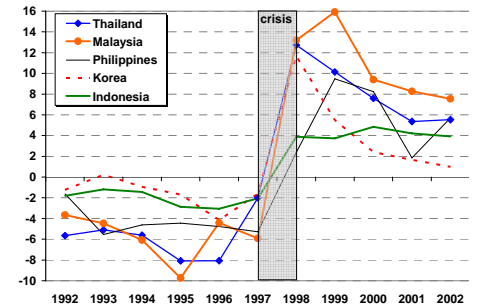
Source: OECD Economic Outlook

Chart 53. Real Effective Exchange Rate, deflated by CPI, year 2000 = 100



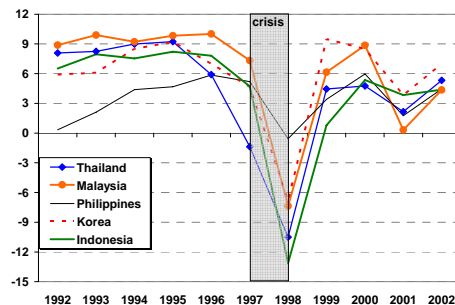
Source: EIU.

Chart 54. Current account, % of GDP



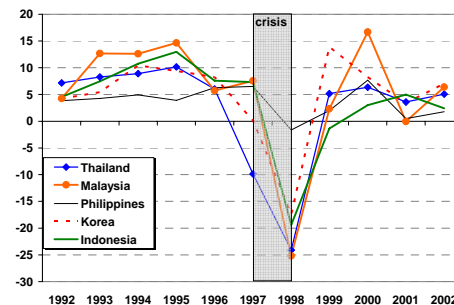
Source: IFS, EIU.

Chart 55. Real GDP growth, y/y, %



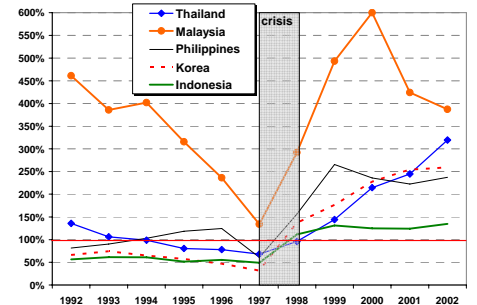
Source: IFS, EIU.

Chart 56. Domestic demand, y/y, %



Source: IFS, EIU.

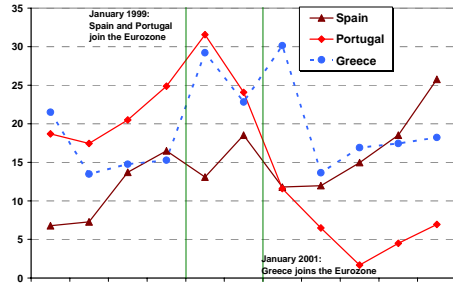
Chart 57. Foreign currency reserves-to-foreign short-term debt ratio, %



Source: EIU.

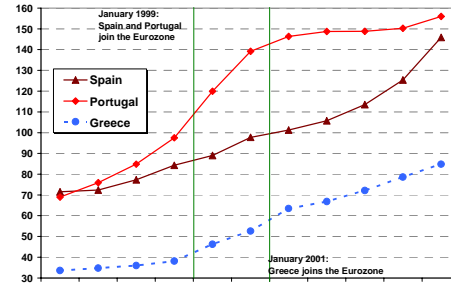
# Spain, Portugal and Greece 1995-2005

Chart 58. Credit to the private sector, y/y growth, %



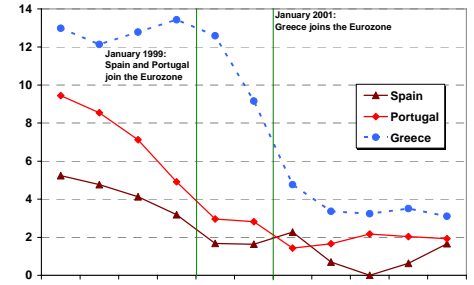
Source: World Development Indicators.

Chart 59. Credit to the private sector-to-GDP ratio, %



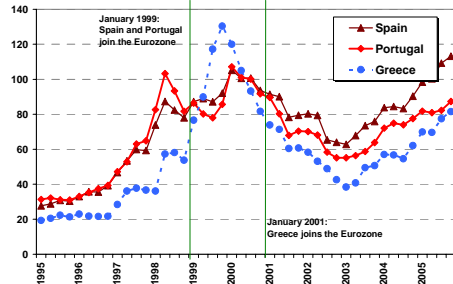
Source: World Development Indicators.

Chart 60. Real lending interest rates, %



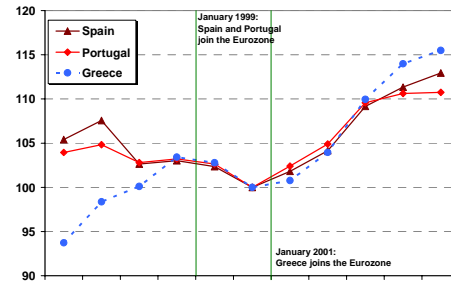
Source: IFS.

Chart 61. Share price index, year average 2000 = 100



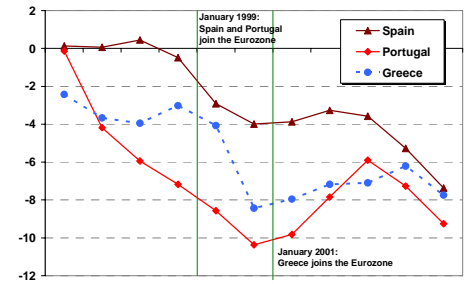
Source: OECD Economic Outlook

Chart 62. Real Effective Exchange Rate, deflated by CPI, year 2000 = 100



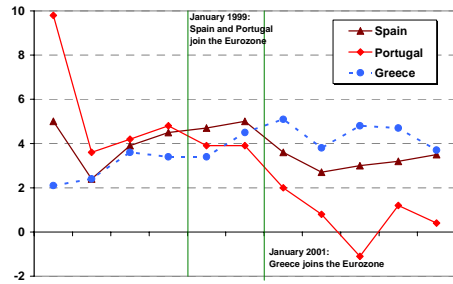
Source: EIU.

Chart 63. Current account, % of GDP



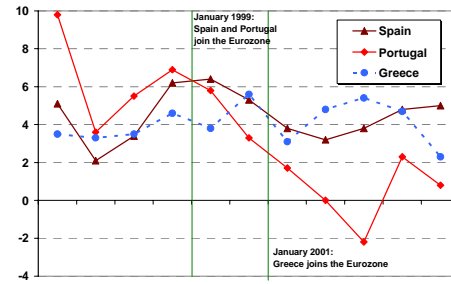
Source: Eurostat.

Chart 64. Real GDP growth, y/y, %



Source: Eurostat.

Chart 65. Domestic demand, y/y, %



Source: Eurostat.