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Assessing and Managing Rapid Credit Growth and the Role of Supervisory and Prudential Policies

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Assessing and Managing Rapid Credit Growth and the Role of Supervisory and Prudential Policies

Prepared by Paul Hilbers, Inci Otker-Robe, Ceyla Pazarbasioglu, and Gudrun Johnsen[1]

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Abstract

This paper reviews trends in bank lending to the private sector, with a particular focus on Central and Eastern European countries, and finds that rapid growth of private sector credit continues to be a key challenge for most of these countries. The paper discusses possible implications for economic and financial stability and the policy options available to counter and reduce these risks. It argues that the authorities will need to focus on the implications for both the macro economy and the financial system and, depending on their assessment, may need a comprehensive policy response comprising a mix of macro and prudential policies. In particular where there are limitations to the effective use of monetary and fiscal measures, supervisory and prudential policy responses will have a key role in addressing financial stability concerns.

JEL Classification Numbers: E44, E51, G21

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I. INTRODUCTION

This paper discusses the phenomenon of rapid growth in bank credit to the private sector, which in recent years has been particularly prominent in many Central and Eastern European countries as well as countries to the East and South of the European Union (a group henceforth referred to as "CEE"). In the past few years, real growth rates of credit to the private sector in these countries were often in the range of 30–50 percent per annum, albeit beginning from a low base. This trend has generally been viewed as a normal and positive consequence of the growing degree of deepening and restructuring of the financial system. It fits in with the transition process from centrally planned to market-based economies and has often been supported by the prospect of European Union (EU) accession. At the same time, however, there are growing concerns about the implications for macroeconomic and financial stability, in particular where rapid credit growth has coincided with a weakening current account and vulnerabilities in the financial systems.

The paper reviews the trends in bank lending to the private sector in CEE countries; identifies episodes and cases of rapid credit growth; discusses possible implications for macroeconomic and financial stability; and discusses the pros and cons of a number of instruments—both macroeconomic and prudential in nature—that could be used to counter and reduce these risks, drawing on country experiences. It is by no means the first study on this topic[2], and it focuses in particular on developments in the most recent years, which have often shown a further acceleration of credit growth. The distinctive feature of this paper is that it concentrates on the supervisory and prudential implications of rapid credit growth, and on how prudential and supervisory policies could be used in strengthening the resistance of the financial system to adverse consequences of rapid credit expansion. These prudential and supervisory aspects, and their relationship to macroeconomic policy responses as part of an overall policy mix, have received less attention in the literature.

The paper is organized as follows. Section II discusses the possible factors underlying rapid growth of credit and the implications for macroeconomic and financial stability. Section III provides a brief summary of recent developments in bank credit in the CEE countries and, drawing on stylized facts on the behavior of selected macroeconomic and financial variables during episodes of rapid credit growth internationally, discusses the implications for CEE economies. Section IV discusses the wide variety of possible policy responses, with greater focus on prudential and supervisory measures. Concluding remarks follow in Section V.

II. ANALYSIS OF RAPID CREDIT GROWTH

This section provides a brief overview of the factors underlying a rapid expansion of bank credit to the private sector and its possible implications for macroeconomic and financial stability. It establishes a framework to analyze a credit growth process by providing a menu of indicators of vulnerability that could be examined and monitored to assess the possible risks.

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[2] See also Cottarelli, Dell'Ariccia, and Vladkova-Hollar (2003), Schadler and others (2004), Maechler and Swinburne (2005), International Monetary Fund (2004a), and Watson (2004).

The literature generally identifies three main drivers of rapid credit growth:[3]

- During the development phase of an economy, credit grows more quickly than output (Favara, 2003; King and Levine, 1993; and Levine, 1997). This "financial deepening" argument is supported by empirical work suggesting that a more developed financial sector helps promote economic growth.

- Credit expands more rapidly than output at the beginning of a cyclical upturn due to firms' investment and working capital needs, according to the conventional accelerator models (see, e.g., Fuerst, 1995; and International Monetary Fund, 2004a).

- Excessive credit expansions may result from inappropriate responses by financial market participants to changes in risks over time. According to the "financial accelerator models"[4] over-optimism about future earnings boosts asset valuations, leads to a surge in capital inflows, increases collateral values (increases the relative price of nontradables), and allows firms and households to borrow and spend. If performance falls below these expectations, asset prices and collateral values decline. This reverses the financial accelerator, increasing the indebtedness of the borrowers, decreasing both their capacity to service their loans and their access to new loans. These factors play an important role in extending a boom and increasing the severity and length of a downturn.

In practice, it has proven difficult to distinguish among these three factors driving credit growth and to determine a "neutral" level or rate of growth for credit.[5] When assessing rapid credit growth, it is therefore necessary to carefully consider the potential implications for macroeconomic stability. A rapid expansion of bank credit to the private sector may affect macroeconomic stability by stimulating aggregate demand compared to potential output and creating overheating pressures, as bank lending fuels consumption and/or import demand, with subsequent effects on the external current account balance, inflation, and currency stability. A continued deterioration in the current account deficit may in turn trigger a cutback of external credit lines and foreign liquidity and thus lead to a deterioration of the condition of the banking system, bringing about a full-fledged financial and economic crisis.

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[3] See, for example, International Monetary Fund (2004a) and Gourinchas, Valdes, and Landerretche (2001).

[4] See Bernanke and Gertler (1995), Bernanke, Gertler and Gilchrist (1999), Borio, Furfine and Lowe (2001), Kindleberger (1996), Kiyotaki and Moore (1997), and Minsky (1992).

[5] Cottarelli, Dell'Ariccia, and Vladkova-Hollar (2003) estimate an equation for bank credit to the private sector as a function of public debt, per capita income, inflation, financial liberalization, and the legal system, and they use this equation to determine an equilibrium level with which actual levels can be compared. They note, however, that the ongoing transition process in these countries complicates the determination of a "normal" growth rate, and that the focus on aggregate credit developments may lead to an underestimation of risks.

Rapid credit growth also has implications for financial stability. There is a large body of literature that links credit overexpansion and banking crises.[6] Kaminsky, Lizondo, and Reinhart (1997), in a survey of the literature, report that five out of seven studies find credit growth to be an important determinant of banking and/or currency crises. Goldstein (2001) provides evidence on the link between a credit boom and the likelihood of twin crises (banking and currency crises) as a result of capital flows. Similarly, a recent study (International Monetary Fund, 2004a) concludes that credit booms pose significant risks for emerging market countries, as they are generally followed by sharp economic downturns and financial crises. In a broad sample of boom episodes over forty years, lending booms are often found to be associated with a domestic investment boom, an increase in domestic interest rates, a worsening of the current account, a decline in international reserves, a real appreciation of the exchange rate, and a fall in growth of potential output. About three-fourths of credit booms are shown to be associated with a banking crisis and almost seven-eighths with a currency crisis.

The macroeconomic and microeconomic implications of rapid credit growth are interrelated. On the one hand, in a situation of continued macroeconomic deterioration (inflation and/or external imbalances), financial stability will likely also deteriorate. For example, macroeconomic imbalances impact the stability of the financial system as the repayment capacity of borrowers may worsen with the slowdown in economic activity and the movements in interest and exchange rates associated with the macroeconomic instability. On the other hand, concerns about financial sector health may lead to macroeconomic instability, as markets react to such concerns by adjusting investment portfolios, including holdings of currencies.

These risks are generally underestimated during booms due to measurement difficulties both in forecasting overall economic activity and its link with credit losses, and in assessing how correlations of credit losses across borrowers and lenders change over time. This underestimation of risk may result in overoptimism about the degree of structural change that may be fueling the credit growth and a socially suboptimal reaction to risk by market participants. Incentive structures that reward short-term performance further contribute to credit growth even if risk is measured properly. Certain accounting and regulatory frameworks may also encourage or lead to lending decisions that may contribute to financial system vulnerability. Moreover, rapid credit growth may result from certain micro- or bank-level factors that create incentives for banks to take on excessive risk, including moral hazard arising from implicit or explicit government guarantees or inappropriate governance structures.

The banks' ability and resources to monitor and manage risks are also stretched by the increased volume and speed of credit expansion. Substandard loan-granting procedures and unrealistic projections of future repayment capacity of borrowers may distort the growth and allocation of credit. Such exuberance would allow large exposures to develop, which could

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[6] See Demirguc-Kunt and Detragiache (1997), Drees and Pazarbasioglu (1995), Goldfajn and Valdes (1997), Goldstein (2001), Gourinchas, Valdes and Landerretche (2001), Kaminsky, Lizondo, and Reinhart (1997), and Kaminsky and Reinhart (1999).

magnify real sector costs in the event of a shock. Governance issues related to insider or connected lending may be aggravated under these circumstances. Apart from developments in the amount of credit, the nominal increase in the number of loans is a relevant factor, also in terms of the ability of the banks and supervisors to assess credit quality. Banks need to have sufficiently trained credit assessors to determine which credit requests should be honored. However, even if the assessors are skilled, the sheer number of credit applications in an upswing may be so large that the existing staff cannot handle them. In that case, requests that should not be considered may be accepted. Credit bureaus may help to alleviate the problems but may not always be established or functioning properly.

The inter-relationship between macroeconomic and financial sector stability suggests that in determining the risk profile of and policy responses to rapid credit growth, a more detailed analysis of its characteristics is important. When it has been determined that bank credit to the private sector is growing at a rapid pace, there will be a need to collect and monitor more detailed information about this process. No less important are to have a detailed breakdown of aggregated credit data according to the borrower and to have information on the purpose, use, and specific features of the loans. All these aspects are relevant to assess the risks and to determine the best policy response, since the magnitude of losses in the event of an adverse shock will depend on the degree of maturity mismatches, the sectoral composition and concentration of credit, the relative importance of collateral-based lending, the currency exposure of banks and borrowers, the availability of hedging instruments, and the extent to which banks and borrowers use these instruments to cover their exchange and interest rate risks. Box 1 further discusses the various ways to assess the nature of credit growth.

More generally, assessing risks associated with rapid credit growth involves a comprehensive analysis of the stability of the macro economy and the financial system (Table 1). Such an assessment includes a variety of relevant macroeconomic and financial sector data (financial soundness indicators and structural financial sector data), as well as information from stress tests and scenario analyses to determine the sensitivity of the financial system to macroeconomic and market shocks (International Monetary Fund, 2005a). Real estate developments require special attention, as indicated above. Market-based information complements the financial sector data by conveying market perceptions of the health and stability of the financial system. Information on the quality of the institutional and regulatory frameworks, mostly through assessments of the compliance with international financial sector standards, helps in interpreting and assessing developments in prudential variables.

III. Country Experiences with Rapid Credit Growth

Given the framework suggested in Section II, this section assesses the challenges associated with the continuing rapid credit growth to the private sector in some of the CEE countries. The first subsection provides an overview of the recent developments regarding credit growth in CEE countries and finds that credit to the private sector continues to grow at a very rapid pace in many of these countries. In the following subsection, the experience of CEE countries is compared with that of other countries that have experienced credit booms, with a particular

Box 1. Analysis of the Nature of Credit Growth

In determining the risk profile of, and policy response to, rapid credit growth, a more detailed analysis of its characteristics is important. Such analysis would include a detailed breakdown of aggregated credit data according to the borrower, the purpose and use of the loans, their sectoral composition and concentration, the currency denomination, and the maturity and other conditions of the loans.

In terms of the breakdown of credit data, a key element is the **type of borrower**, in particular, the distinction between households and the corporate sector. Households tend to borrow for purchases of durable consumer goods (e.g., cars) or for real and financial assets. Consumer loans are generally relatively small; there may be substantial risks involved on a case-by-case basis, but the overall risk is diversified due to the large number of the debtors. There have been few cases where rapid expansion of consumer loans has led to systemic problems. Household borrowing for purchases of assets has a very different risk profile. Mortgage lending and lending for equity purchases involve higher amounts—in the case of real estate lending, often a multiple of the household's income—but are generally supported by collateral. Key variables in assessing the risks are loan-to-value ratios, the effectiveness of collateral legislation, and the financial health of the borrowers. With regard to the latter, it is important to closely monitor the overall balance sheet of the household sector and in particular the degree of indebtedness in relation to disposable income. But these indicators may not be sufficient to detect asset price bubbles, and therefore a careful analysis of the relationship between asset prices and, in particular, rates of return on assets may be needed in cases where bubbles are suspected. With regard to corporate loans, the risk of the latter is increased by weaknesses in transparency, accounting, contract enforcement etc., to an extent that in some countries lending to households (for which these problems are not so serious) can actually be less risky.

Within the corporate sector, it is useful to conduct a **sectoral breakdown of the borrower**. A distinction between various sectors (agriculture, manufacturing, construction, services, etc.) is useful to determine the likely character and purpose of the loan—e.g., whether the credit provided will be used for productive economic activities. A careful analysis of sectoral balance sheets and financial results plays a key role in assessing corporate sector credit risk. In addition, it may be relevant to include the ownership of the industry sector as a relevant factor, distinguishing between credit to state-owned enterprises, domestic private enterprises, and foreign-owned industries.

The **currency denomination** is another key factor in assessing rapid credit growth. Borrowing in foreign currency is generally driven by lower foreign interest rates compared to domestic rates. The main risk is related to the exchange rate. Banks are generally constrained by limits on open foreign exchange positions, which forces them to fund these credits in foreign currency as well, e.g., through foreign currency deposits, credit lines with the banks' foreign owner, or other borrowing from abroad. But their customers may not be hedged, hence it will be important to assess whether the borrower has foreign exchange income that can be used to repay the debt and/or whether hedging instruments are available and used. Even if the banks are fully covered against currency risk, the exchange rate risk for their clients may translate into sizeable credit risk for the banking sector.

Other relevant factors include **maturity, interest rate conditions, and collateral**. When maturities are short, repayment problems surface at an early stage, unless evergreening practices are widespread. In general, maturities in emerging markets will tend to be shorter than in fully developed markets, due to a lack of available long-term funding. For the same reason, interest rate fixation periods will tend to be shorter. If expectations of interest rate declines prevail, unexpected interest rate increases may result in debt servicing problems for debtors. Collateral—if it can readily be accessed and used to cover defaults—reduces the risk for financial institutions and creates an incentive for debtors to meet their obligations. It may, however, also exacerbate cycles in real estate lending.

More generally, rapid credit growth and **real estate market developments** are often closely related, which makes close monitoring of the latter essential in assessing credit growth. Booms and busts in asset prices (in particular for real estate) can contribute to unbalanced credit growth, resulting in financial sector distress and macroeconomic imbalances. There are various channels through which real estate cycles and bubbles can develop. Optimistic investors may drive up prices since the supply reaction is slow due to lags in construction. Cycles can be exacerbated by the use of real estate as collateral for financing, and by financial institutions' capital gains on their own holdings of real estate, which increase their ability to lend. In addition, financial sector liberalization can extend the sector's ability to finance real estate transactions in an environment of potentially insufficient credit assessment skills. A lack of good quality and timely data on real estate developments, however, can complicate assessing the risks associated with real estate market developments.[1]

[1] On the specifics of real estate markets and related measurement issues, see Hilbers, Lei, and Zacho (2001), Sundararajan and others (2002), and Bank for International Settlements (2005).

Table 1. Components of the Analysis of Rapid Credit Growth

Key data	Provide information on
Macroeconomic data (inflation, current account, etc.)	Pending macro risks or vulnerabilities
Financial Soundness Indicators (capital, asset quality, earnings, liquidity)	Soundness and resilience of the financial sector
Sectoral balance sheets (corporate sector, households)	Corporate sector debt and earnings Household sector indebtedness
Stress tests of the financial system (sensitivity of balance sheets to shocks)	Vulnerability to changes in key macro and market variables
Real estate market developments (price developments, rents, vacancy levels, etc.)	Unbalanced developments and potential bubbles in the market
Other market data (stock prices and yields, credit ratings)	The markets' expectations about future risks and returns
Structural financial sector information (size, ownership, concentration, legal framework)	Risks of contagion and owner's obligation and ability to control such risks
Qualitative information (compliance with financial sector standards)	Quality of data (transparency) and of supervision and regulation of markets and institutions

emphasis on those countries that have experienced crises in the aftermath of credit booms and on the countries experiencing credit booms that have adopted the euro (henceforth called "euro-convergence countries," including Greece, Ireland, Portugal, and Spain). The section concludes with an assessment of the emergence of risks as a result of the ongoing credit booms in the CEE countries.

A. Recent Developments in Credit Growth in the CEE Countries

Many of the CEE countries have been experiencing a rapid expansion of bank credit to the private sector in recent years. This process, which was already apparent at the beginning of this decade, has only become stronger since.[7] During 2000-04, credit increased by about 17 percent a year on average in real terms across the region (Table 2).[8] In 2004, credit to

[7] In all the countries that had been identified as "early risers" in Cottarelli, Dell'Ariccia, and Vladkova-Holar (2003), with the exception of Croatia and Poland, credit continues to rise at a rapid pace (Bulgaria, Estonia, Hungary, Latvia, and Slovenia). Some of the "sleeping beauties" (Albania and Romania, and lately the Czech and Slovak Republics) seem to have woken up, while in "late risers" (Bosnia and Herzegovina, Serbia and Montenegro, and Lithuania), real growth of credit has continued to rise.

[8] This paper focuses on bank credit to the private sector, excluding bank credit extended to the public sector and credit extended by nonbank financial institutions for which data availability is limited. Breakdown of credit between foreign and domestic currency denominated components is also not available across all countries in the sample, and hence no attempt has been made to treat them separately in the analyses. Moreover, the credit growth figures used in the analyses were all obtained from International Financial Statistics for purposes of comparability and may differ from those of the national authorities.

Table 2. Growth of Private Sector Credit in Eastern and Central European Countries (in percent)

	2000	2001	2002	2003	2004	Average (2000-2004)	Cumulative Change (1999-2004) 1/
Real Growth of Credit							
Countries with real credit growth higher than the sample average (16.8%)							
							...
Ukraine	32.9	25.5	48.8	55.7	21.6	*36.9*	...
Latvia	28.1	33.5	34.3	41.2	41.1	*35.6*	...
Albania	33.9	38.9	25.6	23.0	28.5	*30.0*	...
Bulgaria	6.0	23.0	34.6	45.4	40.5	*29.9*	...
Lithuania	-7.0	4.9	30.1	60.8	38.1	*25.4*	...
Russia	27.2	25.1	12.3	27.4	34.0	*25.2*	...
Belarus	6.8	8.3	16.2	43.8	36.1	*22.2*	...
Estonia	7.4	12.1	15.6	30.9	39.5	*21.1*	...
Moldova	6.1	26.2	31.0	29.8	7.9	*20.2*	...
Hungary	30.3	8.0	13.6	27.4	11.2	*18.1*	
Countries with real credit growth lower than the sample average (16.8%)							
Croatia	1.4	17.2	27.5	13.1	11.3	*14.1*	...
Romania	-10.2	16.5	14.2	23.7	18.9	*12.6*	...
Slovenia	7.6	9.6	5.2	9.3	16.0	*9.5*	...
Bosnia	0.7	-26.7	27.3	19.5	14.9	*7.1*	...
Macedonia	-9.0	-7.3	2.3	14.0	24.0	*4.8*	...
Poland	5.8	1.9	2.4	5.8	0.1	*3.2*	...
Czech Republic	-9.7	-15.0	-22.8	8.5	10.3	*-5.8*	...
Slovak Republic	-7.1	-26.2	10.9	-19.8	-0.4	*-8.5*	...
Sample Average	**8.4**	**9.7**	**18.3**	**25.5**	**21.9**	***16.8***	
Credit-to-GDP Ratio							
Countries with real credit growth higher than the sample average (16.8%)							
Ukraine	11.1	12.9	17.5	24.3	24.9	*18.1*	*16.4*
Latvia	17.2	21.3	26.5	34.6	45.4	*29.0*	*30.9*
Albania	4.6	5.9	7.3	8.4	9.9	*7.2*	*6.0*
Bulgaria	12.6	14.9	19.6	27.4	36.7	*22.2*	*24.6*
Lithuania	11.4	11.4	14.0	20.4	25.6	*16.6*	*12.8*
Russia	13.3	16.5	17.7	21.0	24.5	*18.6*	*11.5*
Belarus	8.8	8.2	8.9	11.9	13.9	*10.3*	*4.7*
Estonia	23.9	25.2	26.9	33.1	43.3	*30.5*	*19.0*
Moldova	12.6	14.7	17.1	20.5	21.3	*17.3*	*9.5*
Hungary	32.4	33.7	35.8	43.0	46.0	*38.2*	*19.9*
Countries with real credit growth lower than the sample average (16.8%)							
Croatia	37.2	42.2	50.7	54.2	57.5	*48.4*	*20.3*
Romania	7.2	7.7	8.3	9.5	10.0	*8.5*	*2.0*
Slovenia	36.4	38.4	38.9	41.5	46.3	*40.3*	*12.4*
Bosnia	43.3	30.1	36.3	41.4	45.2	*39.2*	*-0.6*
Macedonia	17.8	17.6	17.7	19.5	23.6	*19.3*	*2.8*
Poland	27.3	27.9	28.4	29.0	27.7	*28.1*	*1.7*
Czech Republic	47.9	39.6	29.8	30.7	32.2	*36.0*	*-21.1*
Slovak Republic	51.3	37.6	39.6	31.6	30.6	*38.1*	*-23.9*
Sample Average	**23.1**	**22.5**	**24.5**	**27.9**	**31.4**	**25.9**	**8.3**

Source: International Financial Statistics, World Economic Outlook and IMF staff calculations.
1/ Percentage point difference between figures for 2004 and 1999.

the private sector increased by about 30-45 percent in real terms in six of the countries in the region. In a number of countries, growth continued at an unabated pace (Belarus, Bulgaria, Estonia, Latvia, and Russia), while in others (Hungary, Lithuania, Moldova, and Ukraine), the pace started to decelerate somewhat from early 2004, albeit remaining at high rates. As a result, the ratio of private sector credit to GDP has also been increasing significantly in these countries, albeit from a low base.[9]

This expansion in credit occurred at relatively low levels of financial intermediation, providing support for the "catching-up" hypothesis. With the exceptions of Estonia and Hungary, the countries with the fastest growth in private sector credit had credit-to-GDP ratios below the group average of 22 percent (compared to the average for the EU-15 countries of over 100 percent of GDP) (Figures 1 and 2). In contrast, in those countries where the real credit growth has been relatively low, the credit-to-GDP ratio has been generally above the group average (except in Macedonia and Romania).[10]

Rapid credit growth in the region has been supported by a general easing of monetary conditions and improved economic prospects. Consistent with the "overoptimism" argument discussed in Section II, favorable economic conditions, combined with macroeconomic stability and progress in financial sector reforms, have led to an upward revision in income expectations of the private sector. Consequently, strong consumption and investment in a number of these economies has emerged (e.g., Bulgaria, Estonia, Latvia, Lithuania, and Romania), thereby increasing credit demand. For some of the countries in the region, EU prospects and convergence expectations also played a role in the pace of credit expansion.

Also, in a number of countries, incentives created by the prevailing monetary and exchange rate policy mix, as well as fiscal or quasi-fiscal policies, may have stimulated certain types of bank credit. For example, in many of these countries, exchange rate regimes are characterized by pegged or tightly predictable exchange rates.[11] Combined with wide interest rate margins in the domestic market, predictable exchange rates may have created incentives for borrowing in foreign currencies (by banks and/or borrowers) and led to capital inflows that help stimulate credit expansion. On the fiscal side, open-ended government interest rate subsidies may have stimulated the growth of consumption lending, for example in Hungary; in Estonia, interest rate deductibility of mortgage loans created real estate borrowing incentives; and in Belarus, government guarantees to support bank loans rose sharply in 2004.

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[9] See also Cottarelli, Dell'Ariccia, and Vladkova-Hollar (2003), Schadler and others (2004), and International Monetary Fund (2004b).

[10] Note that the negative growth of credit in the Czech and Slovak Republics in the early 2000s reflects, in part, the efforts to clean up the bad loans in the system.

[11] These regimes include: currency board arrangements in Bosnia, Bulgaria, Estonia, and Lithuania; horizontal exchange rate bands in Hungary and Slovenia; fixed exchange rates in Latvia, Macedonia, and Ukraine; crawling bands in Belarus and Romania; and tightly managed floats in Croatia, Moldova, Russia, and Serbia.

Figure 1. CEE Countries: Real Credit Growth over 2000-04 vs. Credit to GDP in 1999 (in percent)

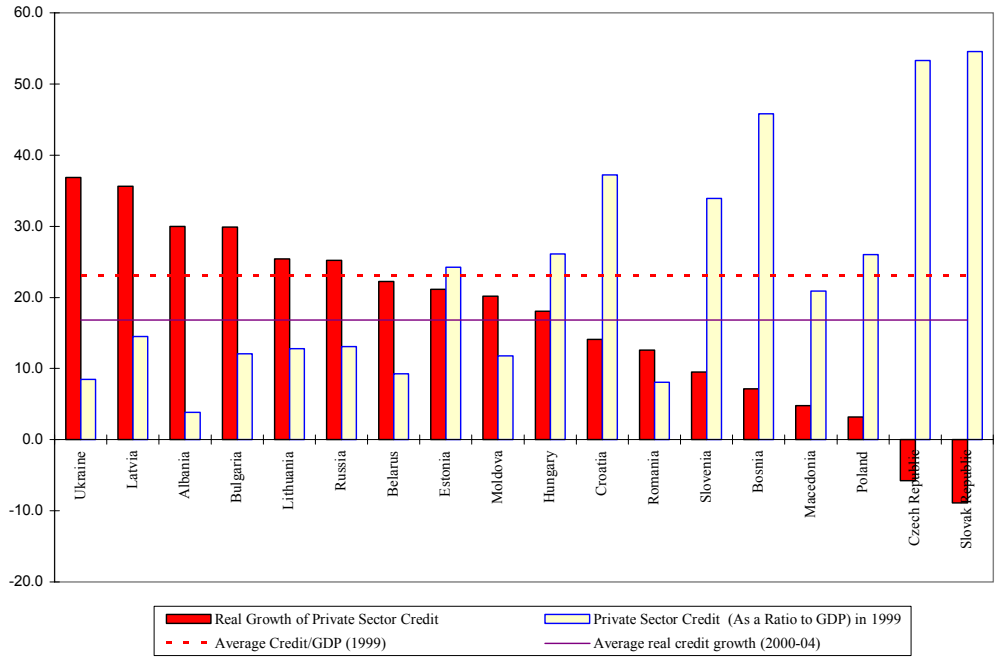
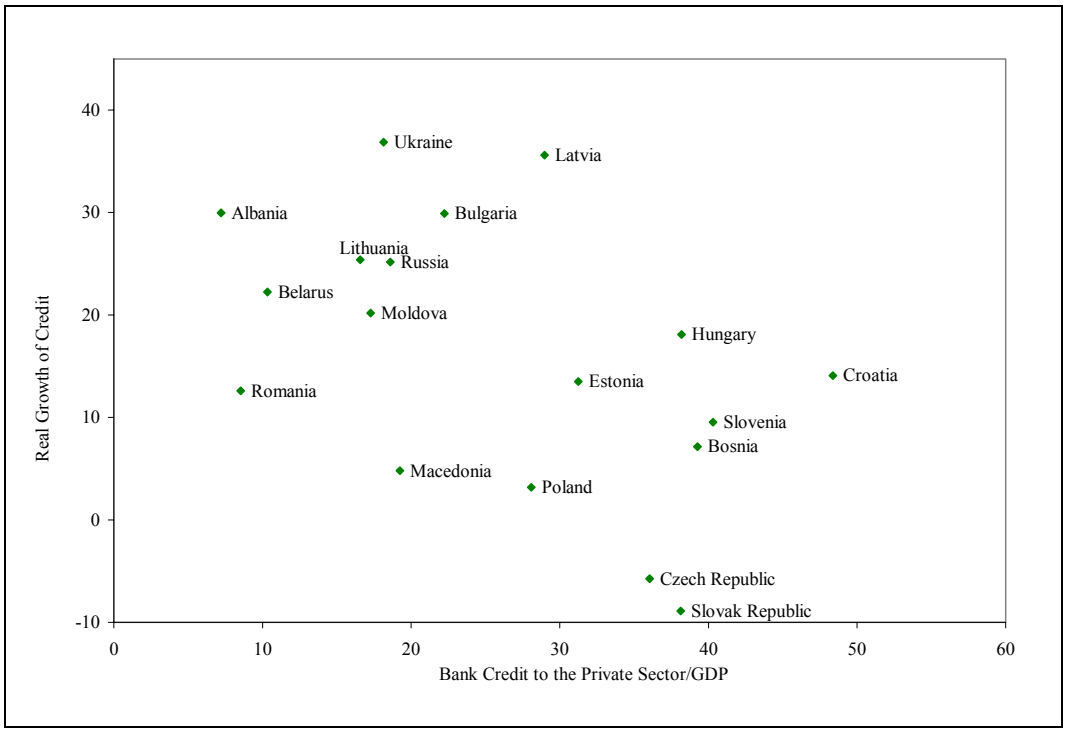


Figure 2. Real Private Sector Credit Growth and Financial Deepening in the CEE Countries (averages over 2000-2004)



In most CEE countries, the banking sector is the most important channel of funds to support increased demand for credit, with capital and equity markets still small and relatively underdeveloped. The share of bank assets in total assets of the financial system (including also insurance companies, pension funds, securities firms, investment funds, and leasing companies) is in fact very high, generally exceeding 75 percent.

Privatization of the banking sector and increased participation by foreign banks has also contributed to rapid credit growth in a number of countries. Banks have now been largely privatized in most of the countries with the fastest growth of credit. The share of foreign ownership of banks has also been very high, with the share of assets ranging from around 60-70 percent (Latvia, Romania, and Hungary) to about 80–90 percent (Bulgaria, Croatia, Estonia, and Lithuania). The expectation of high profits has been an important motive for foreign investors to move into the CEE banking market. While exposure to these countries in foreign banks' overall portfolio remains quite small, steady expansion of the foreign (mainly European) banking groups in the CEE region has had a positive impact on the profitability of the banks. In some of the CEE countries, foreign banks have engaged in aggressive lending to the private sector to raise their share in these profitable markets; this has resulted in downward pressure on lending rates and has helped stimulate credit demand.[12]

B. Country Experiences with Lending Booms and Implications for CEE Countries

This section compares the credit boom episodes in the sample of CEE countries (focus group) with those in a sample of benchmark countries to identify salient features and risks associated with credit booms.[13] In doing so, it uses the methodology developed by Gourinchas and others (2001) to identify countries that have experienced lending booms. The deviation of the ratio of credit to GDP from a rolling country-specific trend is calculated, and lending booms are defined as episodes when the deviation from the trend exceeds a certain threshold value.[14] The

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[12] It is reported that about 70 percent of the CEE banking market is currently controlled by Western European banking groups (Breyer, 2004).

[13] The focus group includes: Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Russia, the Slovak Republic, Slovenia, and Ukraine. The benchmark group includes: Argentina, Australia, Brazil, Canada, Chile, Dominican Republic, Ecuador, Egypt, Finland, Germany, Greece, Iceland, Indonesia, Ireland, Japan, Jordan, Korea, Lebanon, Luxembourg, Malaysia, Mexico, New Zealand, Norway, Paraguay, Philippines, Portugal, Singapore, Spain, Sweden, Thailand, Tunisia, Turkey, United Kingdom, United States, Uruguay, and Venezuela.

[14] The standard Hodrick-Prescott filter is sensitive to the beginning and end values of the series for which the trend needs to be determined. It is appropriate when the trend is to be determined in retrospect, but not as good in determining a boom when it is actually taking place. Gourinchas and others (2001) correct for this by using the recursive or rolling filter, which sets a trend for the first five years, then calculates a trend for the first 6 years, and another for the first 7 years etc. In this way, a continuing boom can be better identified. This methodology has its own shortcomings, which are discussed in more detail in Appendix I.

analysis distinguishes between countries that experienced rapid credit growth and ended up with a banking crisis and those that did not. Crisis countries are those that have been identified by Caprio and Klingebiel (2003) as having experienced systemic banking crisis (see Appendix I for details).

This approach identifies four broad types of lending boom episodes in the sample, with some evidence of bunching up of episodes across time and regions:

- The lending boom episodes with no subsequent crises: These episodes include those of a number of industrial countries (Australia, Iceland, New Zealand, and United Kingdom) , as well as developing countries (Egypt, Lebanon, and Indonesia) in which lending booms were driven largely by the financing needs of a large investment and consumption expansion as a result of structural reforms. These countries experienced a rapid and permanent financial deepening.

- Lending boom episodes with crises in the aftermath of the booms: These include the lending booms in Latin American countries and Turkey, where failed exchange rate based stabilization policies in the 1990s led to banking and currency crises, as well as in Lebanon and the Philippines. These countries suffered from a large disruption to the economy which was exacerbated by a subsequent credit crunch.

- Continuing lending boom episodes in the euro-convergence countries (this group of countries includes Greece, Ireland, Portugal, and Spain).

- Continuing lending boom episodes in certain CEE countries (Belarus, Bulgaria, Hungary, Latvia, Lithuania, Macedonia, and Ukraine).

The duration of boom episodes is shorter in the case of the crisis countries, while noncrisis countries are able to sustain high credit growth for a longer period.[15] Lending booms are continuing in all of the seven CEE countries listed above as well as in the euro-convergence countries. So far, the average duration of the continuing boom episodes in the CEE countries is about 6 years, compared to 10.3 years in the euro-convergence countries (Table 3).
The average level of the credit-to-GDP ratio at the beginning of the boom for the CEE countries (11.3 percent) is closer to the average level for the crisis countries (19.1 percent) than for the noncrisis countries (42.8 percent). However, it should be noted that the low initial credit-to-GDP ratios in CEE countries reflect the underdeveloped nature of domestic financial sector at the beginning of the transition. Many countries liberalized their financial sectors and

[15] The typical boom episode is comprised of a *build-up phase* which starts when the credit-to-GDP ratio rises above the limit threshold and ends a year before *peak year,* during which the episode reaches its largest deviation from the trend. The *ending phase* starts at the end of the peak year and ends when the ratio returns to the limit threshold.

Table 3. Bank Credit to the Private Sector (BCPRS) during Credit Boom Episodes[1,2,3]

Country	Start of Boom	End of Boom	Duration	BCPRS/GDP* at the beginning of boom period	BCPRS/GDP* at the peak of boom period	BCPRS/GDP* at the end of boom period	Average BCPRS/GDP* during boom period	Absolute change of BCPRS/GDP from start to peak on average	Average Real Growth of BCPRS from the start of lending episode until the peak of the boom period
Crisis countries on average			**6.8**	**19.1**	**38.7**	**36.4**	**28.3**	**19.7**	**13.3**
Argentina	1990	1995	6	8.6	19.9	19.2	15.2	11.4	-15.1
Brazil	1993	1995	3	6.4	35.2	29.5	23.7	28.8	49.1
Ecuador	1993	1999	7	17.1	30.7	27.0	25.5	13.6	17.9
Lebanon	1988	1990	3	54.5	54.5	50.8	52.7	0.0	-38.2
Mexico	1987	1994	8	8.1	33.8	33.8	19.4	25.7	21.3
Paraguay	1988	1998	11	8.8	22.9	21.4	16.6	14.0	15.8
Philippines	1988	1998	11	15.0	53.8	45.4	28.9	38.9	17.7
Turkey	1995	2000	6	12.2	17.6	18.0	15.9	5.4	24.6
Uruguay	1981	1982	2	40.2	59.2	59.2	49.7	19.0	29.8
Uruguay	1992	2002	11	20.0	59.7	59.7	35.5	39.7	10.0
Noncrisis countries on average			**9.6**	**42.8**	**80.4**	**85.6**	**64.6**	**41.8**	**27.3**
Australia	1983	1992	10	26.8	59.1	64.2	46.3	32.3	16.9
Egypt	1994	2002	9	25.7	49.4	52.2	42.4	23.7	19.8
Greece	1995	ongoing	9	31.9	66.3	59.4	47.1	34.4	11.0
Iceland	1997	ongoing	7	64.5	101.5	98.2	82.5	37.0	23.1
Indonesia	1984	1993	10	14.3	42.1	45.2	29.5	27.8	28.4
Ireland	1995	ongoing	9	61.1	95.4	114.5	91.1	34.2	33.8
Lebanon	1992	ongoing	12	42.4	89.1	79.5	67.4	46.7	13.6
New Zealand	1985	1992	8	20.6	74.2	82.9	57.2	53.6	34.1
Portugal [4]	1987	ongoing	17	61.4	147.6	146.7	86.4	86.2	8.7
United Kingdom	1986	1990	5	79.4	79.4	112.8	96.3	..	83.8
Continuing booms in euro-convergence countries on average			**10.3**	**59.6**	**106.2**	**109.0**	**80.9**	**46.6**	**16.3**
Greece	1995	ongoing	9	31.9	66.3	59.4	47.1	34.4	11.0
Ireland	1995	ongoing	9	61.1	95.4	114.5	91.1	34.2	33.8
Portugal	1987	ongoing	17	61.4	147.6	146.7	86.4	86.2	8.7
Spain	1998	ongoing	6	84.0	115.4	115.4	99.1	31.5	11.5
Continuing booms in CEE countries on average			**6.1**	**11.3**	**23.2**	**23.2**	**15.5**	**11.9**	**28.9**
Belarus	2002	ongoing	2	6.4	10.5	10.5	8.4	4.0	30.0
Bulgaria	1998	ongoing	6	7.7	17.9	17.9	12.0	10.1	35.8
Hungary	1994	ongoing	10	23.0	41.0	41.0	26.9	18.0	8.8
Latvia	1997	ongoing	7	9.2	32.9	32.9	18.7	23.6	36.2
Lithuania	1998	ongoing	6	11.1	19.7	19.7	13.1	8.6	18.8
Macedonia	1999	ongoing	5	19.6	18.9	18.9	18.2	-0.7	5.8
Ukraine	1997	ongoing	7	2.3	21.9	21.9	11.0	19.6	66.6

[1] The start and end of the boom periods are determined by using the methodology developed by Gourinchas, Valdes, and Landerretche (2001). In cases where the boom is ongoing, the end of the boom period is considered to be the end of the period under consideration.
[2] Note that countries can be categorized under more than one group.
[3] Credit booms in the Nordic countries during the latter part of the 1980s and early 1990s were not detected in this exercise; see further discussion on credit boom identification in Appendix I.
[4] The pace of the credit expansion accelerated in the 1990s.

eliminated distortions at the beginning of the transition, while at the same time strengthening their supervision and regulation. The latter factor should be taken into account in comparing CEE countries to other countries that have witnessed a rapid credit expansion.

The following main developments in macroeconomic and financial sector indicators are observed during the credit boom episodes of the different subsamples (Figure 3):

- Lending booms are accompanied by a sharp deterioration in the trade balance and current account balance in the crisis countries. Similar trends are observed in CEE countries and euro-convergence countries where the current account deficit also widened sharply.

- Lending booms coincide with a decline in inflation in most of the countries. Inflation at the start of the lending boom is much higher in the crisis countries and declines sharply during the credit boom episode (credit booms coincided with stabilization programs in most of these countries). Inflation has been declining from already relatively low levels in most of the CEE countries.

- In the noncrisis countries growth accelerates prior to the start of the lending boom episode and the cyclical upturn continues until the peak. Although growth decelerates in the end phase, unlike in the case of the crisis countries, a sharp downturn is not experienced. In euro-convergence and CEE countries the credit boom period coincides with a period of relatively high economic growth.

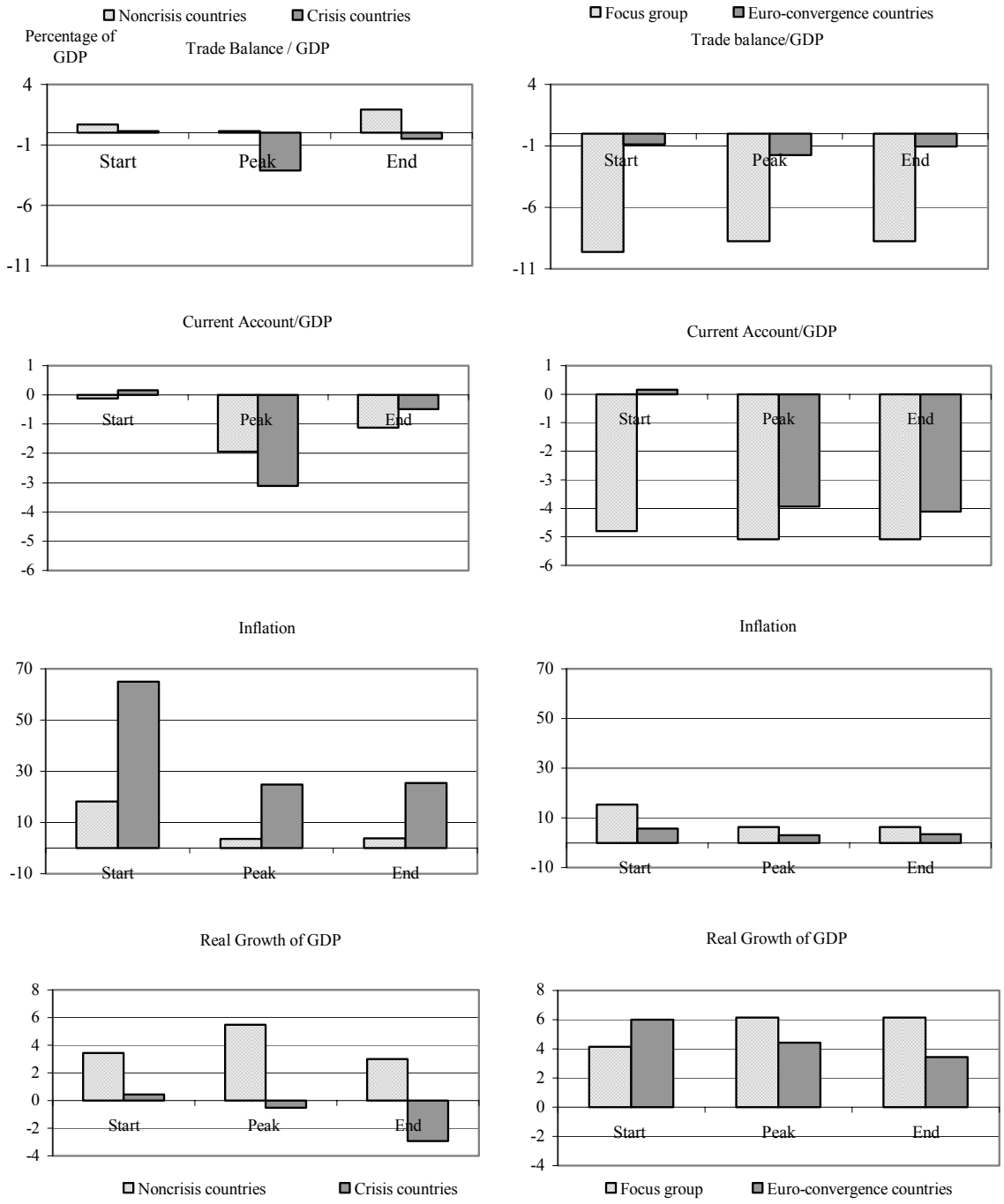
- The fiscal position deteriorates during the build-up phase in the noncrisis countries while it improves in the euro-convergence countries. A sharp deterioration is observed in some of the crisis countries in the aftermath of the lending boom, reflecting the costs of bank restructuring. In most CEE countries the fiscal position has been improving during the course of the credit expansion period.

- The initial lending-deposit rate spreads are much wider in the crisis countries and CEE countries. However, while the spreads remained wide in the crisis countries, they have contracted in the CEE countries during the build-up phase.

- For most of the countries in the sample, loans are also being financed increasingly with liabilities other than deposits (loans are almost fifty percent higher than deposits). In particular for the CEE countries, loans are twice as large as deposits. In those countries, banks expand credit to the private sector by changing the composition of their assets and by increasing external borrowing (Figure 4).

Judging from these experiences, deterioration in external imbalances and high dependence on foreign funding suggest increased vulnerabilities in most of the CEE countries. The rapid expansion of bank credit seems to be associated with high current account deficits in most of the CEE countries. These deficits are partly caused by increasing import demand, which in turn may have been stimulated by credit growth. The low savings rates in most of the countries imply that they are highly dependent on the willingness of foreign investors to fund

Figure 3. Macroeconomic Developments during Credit Boom Episodes (averages; in percent)

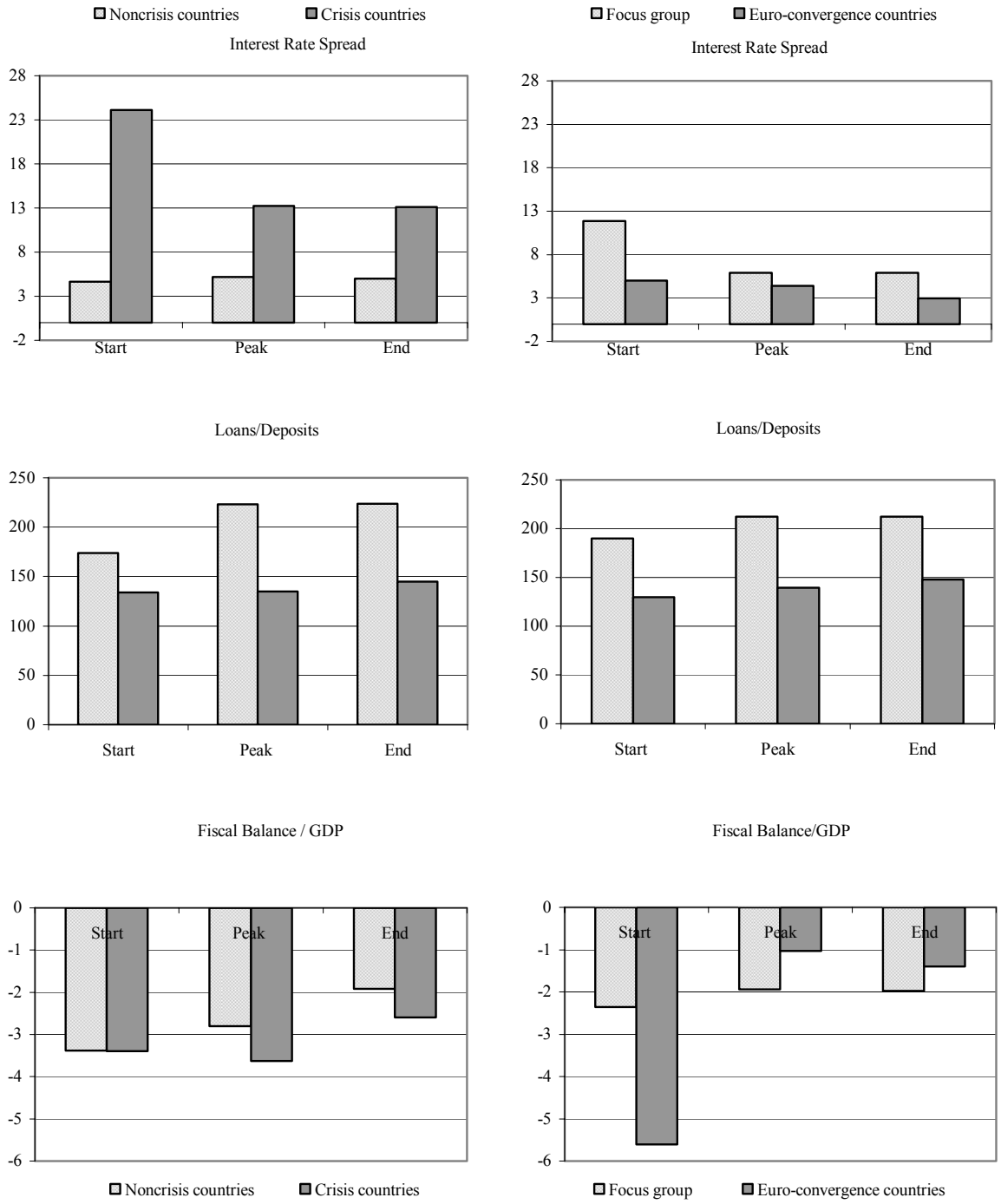


Source: International Financial Statistics, World Economic Outlook, IMF staff calculations

[1] Note that absolute change from start to peak represents average absolute change over the sample.

[2] For the focus group and euro-convergence countries, the end of the credit cycle marks the end of available data, i.e., all of the countries in these groups are experiencing continuing booms.

Figure 3. Macroeconomic Developments during Credit Boom Episodes (cont.)
(averages; in percent)

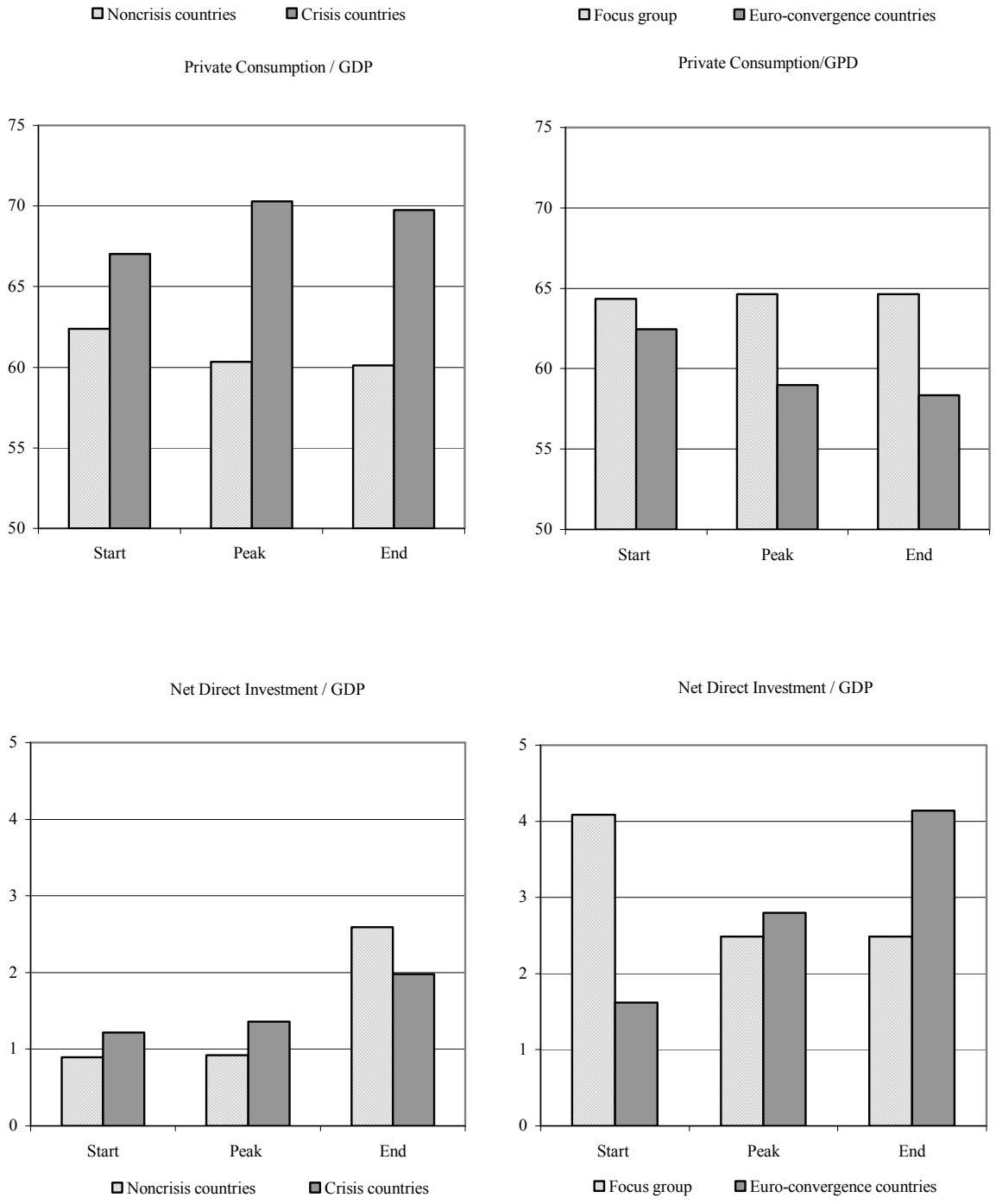


Source: International Financial Statistics, World Economic Outlook, IMF staff calculations

[1] Note that absolute change from start to peak represents average absolute change over the sample.

[2] For the focus group and euro-convergence countries, the end of the credit cycle marks the end of available data, i.e., all of the countries in these groups are experiencing continuing booms.

Figure 3. Macroeconomic Developments during Credit Boom Episodes (cont.)
(averages in percent)

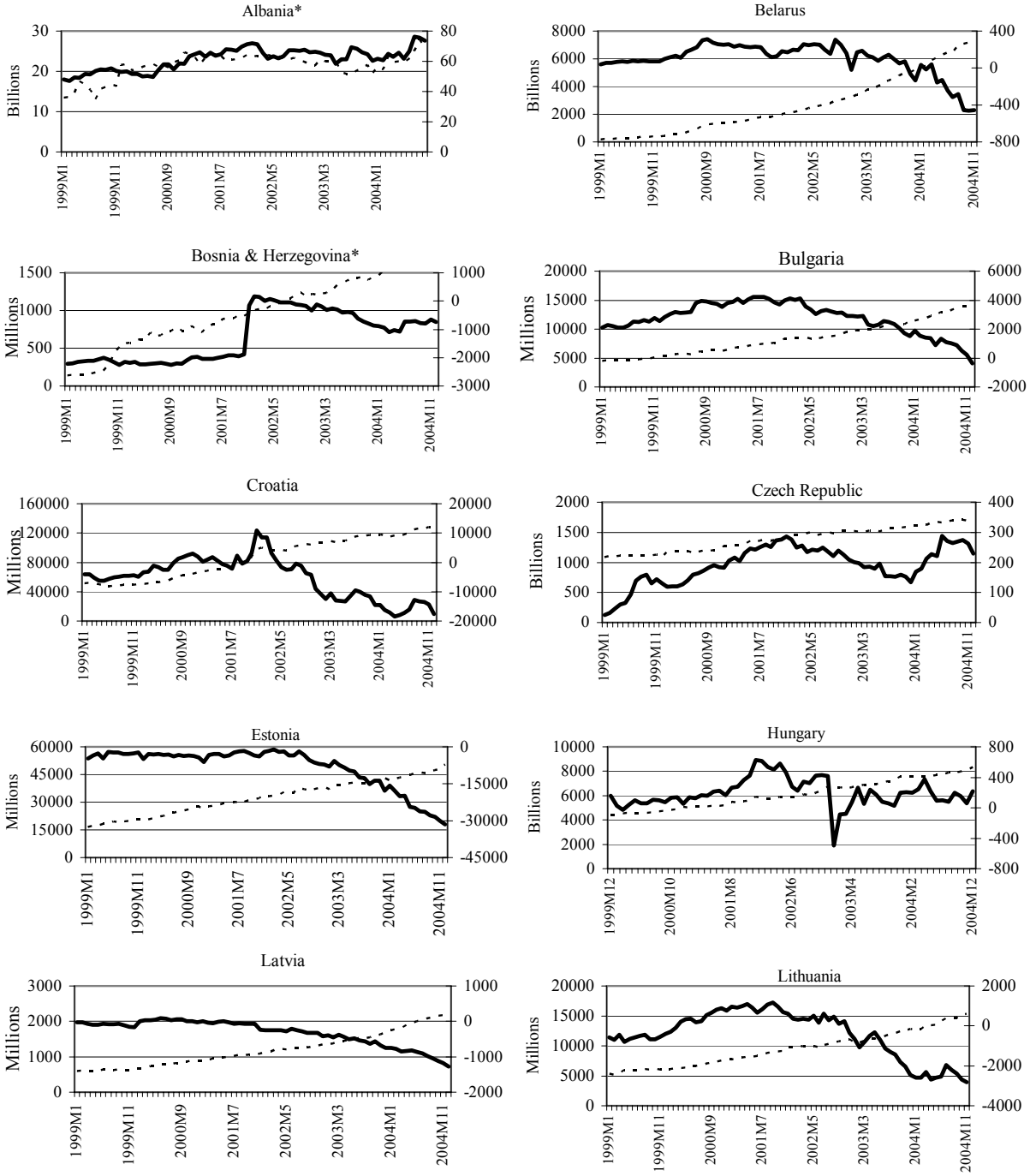


Source: International Financial Statistics, World Economic Outlook, IMF staff calculations

[1] Note that absolute change from start to peak represents average absolute change over the sample.

[2] For the focus group and euro-convergence countries, the end of the credit cycle marks the end of available data, i.e., all of the countries in these groups are experiencing continuing booms.

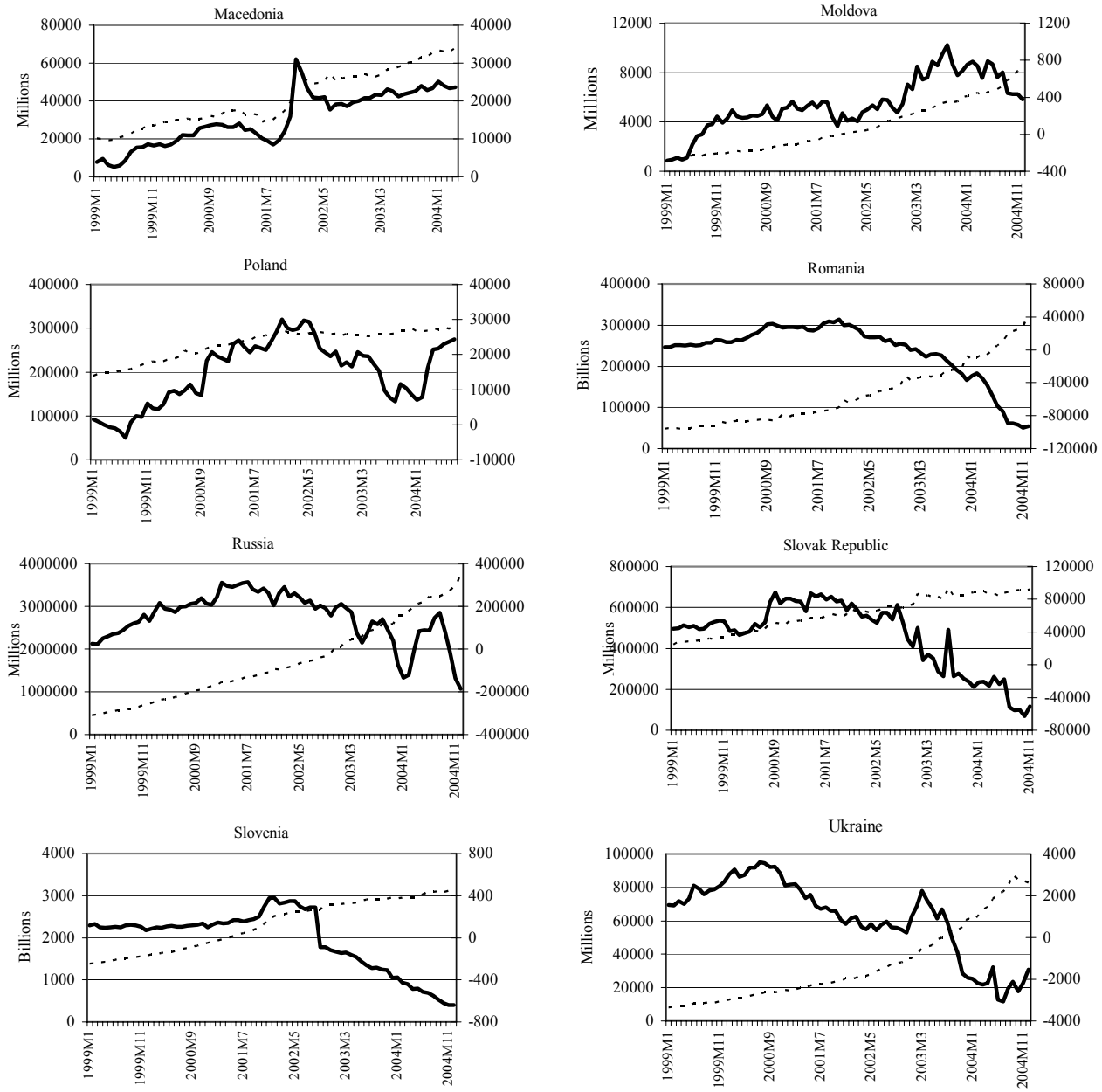
Figure 4. CEE Countries: Funding of the Credit Growth
(in national currencies)



Source: International Financial Statistics
*only demand deposits

Total Deposits (left scale) - - - - - - - - - - - - Net foreign assets (right scale) ———

Figure 4. CEE Countries: Funding of the Credit Growth (cont.)
(in national currencies)



Source: International Financial Statistics

Total Deposits (left scale) – – – – – – – Net foreign assets (right scale) ———

these deficits (Figure 3). An additional source of vulnerability is that the strength of the credit growth has been sustained by an increase in net foreign liabilities of the banks in many of the countries (Figure 4). Banks have been borrowing funds from abroad (including foreign banks from their parents) and/or have been drawing down their foreign assets.

It is not clear how well the comparatively new and untested credit risk systems of many banks in CEE markets are able to cope with a (potential) lending boom. In most CEE countries, the prudential indicators do not seem to indicate a sizable increase in financial vulnerabilities in the banking system: banks are highly capitalized and profitable, either with relatively low or declining nonperforming loans (Table 4 and Appendix II). However, nonperforming loans are usually a lagging indicator of banking system problems, and there have been some indications of a decline in capital adequacy and some increase in credit risks in many of the countries in the group. Potential risks from greater lending to the household/consumer sector are increasing, and in some cases, rapid credit growth started to put some strain on bank supervisors' and banks' capacity to assess risks. In many CEE countries, banks' potential exposure to indirect foreign exchange risks may have increased: foreign-currency-denominated lending represents a substantial proportion of total loans in many CEE countries, while information on customers' foreign currency positions and the extent of their hedging has remained limited. There are also indications of potential liquidity risks in some of the countries, as suggested by the maturity of loans.

A decline in margins may also create strains on the banking system. In the medium term, a lower country risk premium (due to convergence) and increased competition should lead to a convergence of margins towards the EU average (a decline in margins has already been observed in some countries for corporate lending but not for consumer and mortgage lending). Competition should increase as countries become EU member states, because entry barriers will decline under the European single passport regime under which any bank registered in an EU member state can establish branches in another EU country without a local banking license (Breyer, 2004). Potential EU accession has led to increased competition among banks (e.g., in Bulgaria and Romania; Duenwald, Gueorguiev and Schaechter, 2005) as these banks have a strong incentive to increase market shares ahead of full membership. The compression of margins in EU accession countries may come to a point where the margins may become too narrow to compensate for the risks in lending.

IV. Policy Responses to Rapid Credit Growth in the CEE Countries

Experiences of many countries that underwent financial crises suggest that misperceptions of the evolution of risks over time and inadequate or inappropriate policy responses can have costly consequences. As Borio, Furfine, and Lowe (2001) note, there may be a case for a public policy response if it is likely that rapid credit growth is due to inappropriate responses by financial system participants to changes in risk over time. Policies designed to limit vulnerability of the real and financial sector may hence be necessary to prevent macroeconomic and financial instabilities. While there is a need to avoid "crying wolf" when observed developments may be a simple result of

catching-up, it would be unduly optimistic to assume that rapid credit growth to a new, and much higher, "equilibrium" level of credit would automatically be without any risks or need for action.[16]

Table 4. Selected Financial Indicators for the CEE Countries with the Fastest Growth of Credit
(As of 2003, in percent)

Country	Capital ratio (CAR)	Absolute change in CAR since 1999	NPL/ total loans	Absolute change in NPLs since 1999	Foreign bank share	Share of loans to industry	Share of loans to household sector	Share of FX loans	Maturity of loans[1]	Loan to deposits
Belarus	26.0	0.5	4.8	-6.0	21	38	20	50	28	141
Bulgaria	22.2	- 19.1	7.3	-4.3	80	70	28	43	70	81
Croatia	15.7	-4.9	5.1	-5.2	90	40	49	75	..	111
Estonia	14.5	-1.5	0.4	-1.4	90	34	28	60	..	104
Hungary	13.0	-1.2	2.2	-2.0	..	46	..	37	..	443
Latvia	13.0	-3.3	1.9	-4.3	54	..	..	50	80	153
Lithuania	17.0	-0.6	9.0	-2.6	89	69	21	53	73	114
Moldova	31.8	-14.2	6.2	-23.1	38	46	8	43	..	105
Romania[2]	19.9	-3.8	8.3	+3.1	58	..	22	75	50	84
Slovenia	11.5	-2.5	6.5	+1.3	35	75	27	25	61	92
Ukraine[3]	15.1	-4.5	28.3	-7.5	13	30	13	38	44	91

Sources: International Financial Statistics, World Economic Outlook, various IMF country reports.
Explanation: NPL = non-performing loans; FX = foreign exchange.
[1] The share of long-term loans in total loans.
[2] The change in NPLs may partly reflect a tightening of the definition of NPLs in 2003.
[3] Under a relatively tight definition of NPLs, a large share of NPLs is serviced timely.

In considering the appropriate policy response, it would be useful to start from a menu of possible measures and consider their pros and cons, negative consequences and limitations in dealing with the problem, and the circumstances under which they could be used. These options include: macroeconomic policy measures (monetary, fiscal, and exchange rate); prudential, supervisory, and monitoring measures; measures fostering the development of financial markets and institutions; administrative/more direct measures; and measures aimed at an improved understanding of risk (see Figure 5 for a list of measures under each category and Appendix III for more detailed assessments of these measures). The following subsections discuss possible approaches to address rapid credit growth in the CEE countries.

[16] Computing the "equilibrium" level of credit in these economies is not a trivial exercise, given the structural changes that affected these economies and the short time span of economic and financial sector data. Estimation of the equilibrium level for Central and Eastern Europe and Balkan countries in Cottarrelli, Dell'Ariccia, and Vladkova-Hollar (2003) suggests that in most of these countries the current credit-to-GDP ratios are still relatively low compared to the estimated equilibrium levels. Also, Schadler and others (2004) include estimates of equilibrium credit-to-GDP levels and dynamic paths toward them.

A. Measures Taken in Response to Rapid Credit Expansion

The authorities in many of the CEE countries have taken measures while facing the dilemma of whether or not to interfere with ongoing rapid credit expansion. In general, a combination of the measures listed in Figure 5 was used, rather than a single instrument.[17] Monetary measures that have been widely used took the form of interest rate tightening (and in some cases, e.g., in Poland, reduction in domestic interest rates to narrow interest rate differentials), changes in the parameters of reserve requirements, introduction of liquidity requirements, and greater exchange rate flexibility. Fiscal policy has been tightened in some countries or fiscal incentives in the form of mortgage interest deductibility and mortgage subsidies have been reduced (Table 5). Many have taken prudential and supervisory measures in the form of tightening the existing regulations, or close monitoring and assessment of loan underwriting or granting procedures, and/or surveys of banks' direct or indirect foreign exchange exposures. A few have established a credit registry system, credit bureaus, and wider information bases to improve market discipline. In a few countries, administrative measures have been taken through direct credit controls or marginal reserve requirements on foreign borrowing. Moral suasion has also been used on a few occasions. The measures have been, in general, motivated by concerns about emerging signs of external problems as well as the stability of financial systems.

The effectiveness of these policy responses has varied.[18] In a few of the cases, the measures seem to have been effective in reducing credit growth or certain targeted types of lending (e.g., Bosnia, Croatia, and Poland). As discussed in Section III, in many of the countries concerned, credit growth remains strong, with few signs of abating, and in a few others, despite some indications of a slowdown, the rate of growth remains high. Persistent strength of foreign-currency-denominated lending in several countries has continued to keep banks vulnerable to potential (direct or indirect) foreign exchange rate risk.

Efforts to slow down credit have in general been frustrated by a number of factors. The measures had little impact on banks' sources of funds for lending, given their ability to obtain funding through rapid deposit growth and borrowing from abroad (in particular through parent banks). The process was further supported by high profitability of domestic lending, often in the wake of EU accession.

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[17] A combination of instruments has also been used by a number of other European countries that entered the EU earlier and have experienced rapid credit growth during the period of their accession to the euro area (see Appendix IV for details): Greece, for example, imposed direct credit controls, Portugal tightened the prudential and supervisory framework accompanied by a rise in interest rates, while Spain introduced dynamic provisioning. Outside the EU, Iceland has used a combination of moral suasion and monetary measures, including a liquid asset requirement.

[18] Note, however, that many of the CEE countries are still in the midst of a period of rapid credit growth, and some of the measures taken may not yet have demonstrated their full impact. Any assessment of the effectiveness of measures is, therefore, necessarily preliminary. There is also the problem of the counterfactual, that is, the difficulty of determining what could have happened in the absence of these measures.

Figure 5. Menu of Policy Options in Responding to Rapid Credit Growth

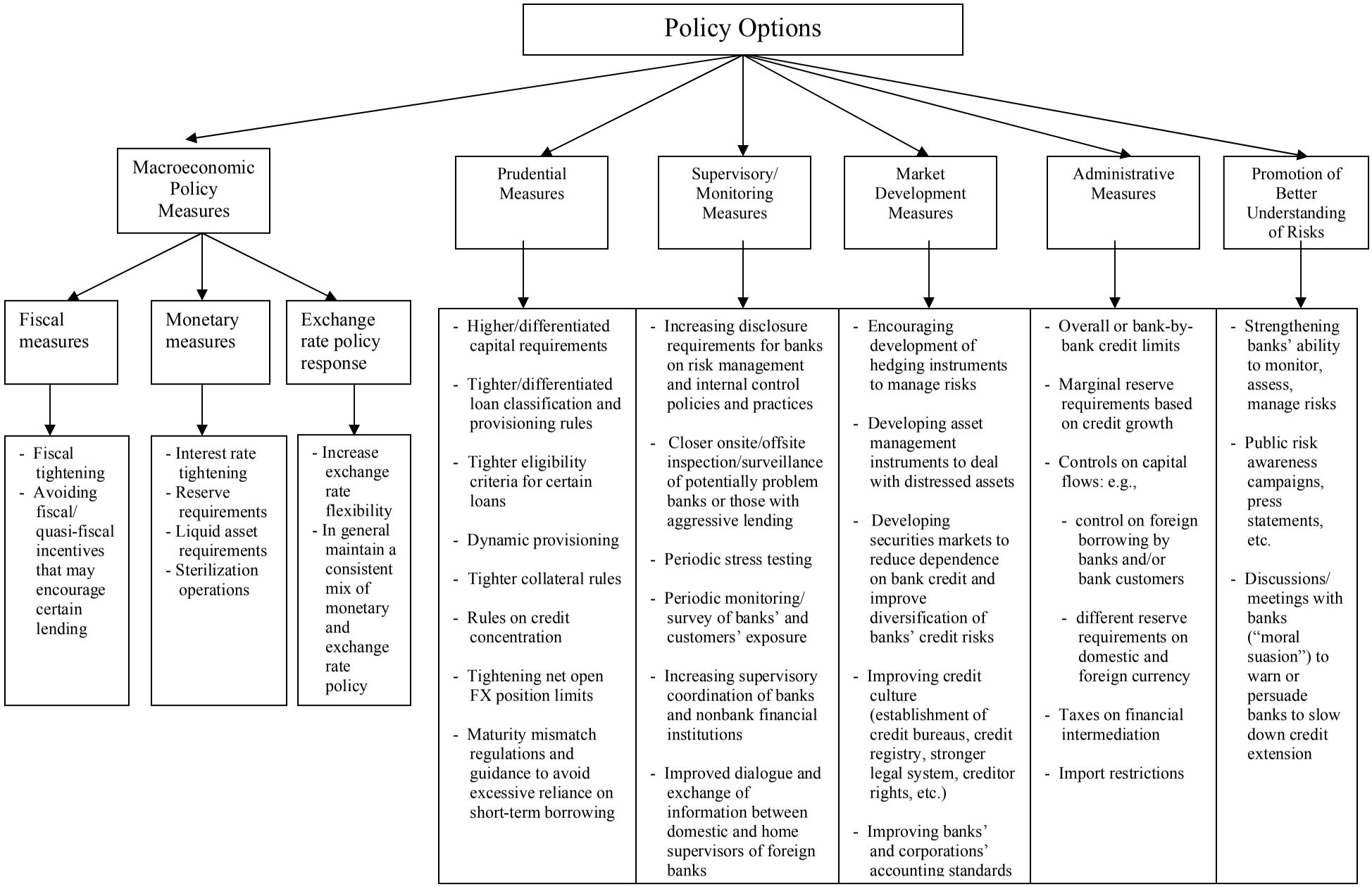

Table 5. Policy Responses to Rapid Credit Growth in Selected CEE Countries

Country	Measures with potential impact on credit growth	Impact to date
Bosnia (2003)	• Monetary measures (tightening—reserve requirements) • Prudential measures (tightening)	Seems to be effective in easing the credit growth.
Bulgaria (mid-2003 - Feb-2005)	• Monetary measures (tightening—reserve requirements) • Fiscal measures (tightening) • Prudential and supervisory measures (tightening of regulations and supervision) • Market development measures (credit registry, wider information base) • Administrative/other measures (credit controls—marginal reserve requirement for banks exceeding a certain level of credit growth) • Other measures (moral suasion)	Domestic credit growth remains strong (though with some stabilization in the growth rate during January-February 2005). Banks remain vulnerable to indirect FX risk. Effect of the recent credit controls remains to be seen.
Croatia (2000-05)	• Monetary measures (moderate tightening—interest rates, foreign exchange liquidity requirements) • Fiscal measures (some consolidation) • Prudential, supervisory, reporting measures (tightening of many prudential regulations and supervision practices) • Administrative measures (direct credit controls—requirement to purchase CNB securities at below-market rates when loan portfolio exceeds a certain level of credit growth; marginal reserve requirement on foreign borrowing)	Credit growth slowed significantly since late 2003, but impact on aggregate demand limited: credit controls circumvented via switch to nonbank and foreign borrowing, with potential adverse impact on soundness of the financial system. Banks remain vulnerable to indirect FX risk.
Estonia (2004)	• Fiscal measures (reducing existing distortions) • Supervisory measures (close monitoring of developments) • Other measures (moral suasion)	Domestic credit growth has remained strong; continued exposure to potential FX risk.
Latvia (2004)	• Monetary measures (tightening—interest rates, reserve requirements)	Credit growth remained strong. Banks remain exposed to indirect FX risk.
Moldova (2004)	• Monetary measures (reserve requirement rules) • Prudential/supervisory measures (the central bank required banks to have separate risk management units to identify and reduce specific risk exposures; assessment of credit risk is made on a borrower-by-borrower basis, and banks share information on problem borrowers on an informal basis, in the absence of a credit registry)	Credit growth slowed somewhat but still remained strong. Banks remain vulnerable to indirect FX risk.
Poland (2001)	• Monetary measures (narrowing domestic interest rate differentials, increasing flexibility of the exchange rate) • Prudential, supervisory, reporting measures (adjusting capital requirements for FX risk, periodic surveys/close monitoring of banks' FX exposure, risk management, and internal controls) • Other measures (moral suasion)	Rapid growth of FX-denominated loans slowed significantly and households became more careful about unhedged borrowing. Total credit growth subdued since 2000.
Romania (2003-05)	• Monetary and fiscal measures (tightening) • Prudential and supervisory measures (tightening—especially tightening of loan classification, eligibility criteria, reserve requirement on banks' FX denominated liabilities) • Market development measures (credit bureau, widening information base) • Administrative measures (postponement of FX liberalization measures)	Credit growth slowed somewhat from August 2003 to April 2004. Growth in lei credit nearly came to a halt, partially offset by a continuing expansion of FX-denominated credit.
Serbia (2004-05)	• Monetary measures (tightening—reserve requirements) • Prudential and supervisory measures (tightening): tightening conditions for consumer loans, broadening the reservable base to include banks' foreign borrowing, increase in capital adequacy ratio; plan to introduce a regulation on monitoring/ managing credit risk from borrowers' exposure to FX risk	Monetary measures did not have a tangible impact, under high euroization. Given the fairly recent implementation of the prudential measures, effectiveness viewed only on a preliminary basis. Consumer lending and credit to non-government slowed down after the tightening measures. Banks vulnerable to indirect FX risk.
Ukraine (2004)	• Monetary measures (limited tightening) • Prudential and supervisory measures (tightening—rules on capital adequacy, quality of bank capital, loan classification, provisioning for FX-denominated loans, related party lending, risk management etc.)	The rate of growth of bank credit slowed down significantly, though still at a relatively high rate. Banks remain vulnerable to indirect FX risk.

Source: See Appendix IV for details on these measures, their timing, and the impact to date; FX = foreign exchange.

Some measures were rendered ineffective by the circumvention of regulations by borrowers (through the ability to borrow directly from abroad or from less supervised/regulated nonbank financial institutions) and by banks (e.g., through window-dressing activities). Integration of domestic markets in the euro environment brought a general easing of monetary conditions that likely stimulated credit demand. The high degree of euroization of the economies, a lack of effective instruments of monetary control, and weaknesses in the monetary transmission mechanism have limited the capacity to effectively use monetary measures.

B. Further Policy Options

The key question is what further options are left for the CEE countries in dealing with rapid credit growth? In contemplating the appropriate policy response, policymakers need to focus on the nature of the associated risks, in particular of macroeconomic and financial risks. As discussed in Section II, these risks are interrelated: particularly when the growth of credit is very rapid, it is difficult to disentangle macro risks from prudential ones, with one possibly leading to, or reinforcing, the other. The policymakers therefore need to focus on both the macroeconomic and the financial implications of the credit growth. This in turn calls for a package of measures that contains both macroeconomic and prudential tools. Adding to the need for a broader policy package is the fact that macroeconomic and prudential measures affect each other. Prudential measures to preserve credit quality may limit certain types of lending and hence have negative implications for macroeconomic and financial sector health; similarly, an appropriate macroeconomic policy mix may limit incentives for excessive borrowing and lending in foreign exchange, hence limiting the scope for deterioration in credit quality. An appropriate combination of macro and prudential measures could then be used to achieve a desired effect on quality as well as quantity of bank loans.

The choice of particular measures will be affected by an assessment of the nature of risks implied by the nature of the credit growth. As discussed earlier, the starting point for such an assessment should be an analysis of the credit growth on the basis of detailed underlying data, including the speed of the growth, breakdown of aggregate credit in terms of the borrower (households, corporate sector, exporters, etc.), the sectoral concentration and allocation of the loan (mortgages, durable consumer goods, investments), the currency composition of loans (foreign exchange versus local currency), the maturity of the loans, availability of adequate collateral, and the funding sources of the credit.

The appropriate policy response will also be affected by the prevailing macroeconomic policy framework. In this context, managing rapid credit growth has been a significant challenge for some of the CEE countries, since the set of available measures is limited due to the specific characteristics of these countries:

- Tightening monetary conditions in response to credit growth may help dampen over-heating pressures by impacting aggregate demand, helping to reduce demand for bank loans, or reducing banks' liquidity base that helps finance the credit growth. However, in many of the CEE countries, the ability to use monetary policy has been constrained

by the underlying monetary policy regime. Most have pegged or tightly managed exchange rate regimes that limit the use of market-based monetary tools in coping with credit growth. In several, effective monetary instruments are not fully developed, constraining the ability to manage liquidity in the system. The relatively high level of euroization (and other structural factors) weakens monetary transmission mechanisms making it difficult to influence lending and retail rates through changes in policy rates. An open capital account limits the ability to use monetary policy effectively in a number of countries, especially with pegged exchange rate regimes, because interest rate tightening may attract capital inflows that can further boost money and credit. Monetary policy can be used effectively if efforts are put into developing market-based monetary instruments and eliminating obstacles to monetary transmission.

- Where there is a significant increase in foreign-currency-denominated lending and a tendency to borrow from abroad, increasing the flexibility of the exchange rate and maintaining a consistent monetary-exchange rate policy mix would help limit direct and indirect foreign currency exposures by reducing perceptions of low exchange rate risk.[19] For example, increasing the flexibility of the exchange rate and allowing domestic interest rate differentials to narrow in combination with supervisory tools helped reduce foreign currency denominated bank lending in Poland during the early 2000s. Where the monetary framework is characterized by formal peg commitments (e.g., in a currency board or under ERM II in a run-up to joining the euro area), room for such policy maneuver is limited, however; the first best policy in this case would be to keep domestic interest rates consistent with the exchange rate commitment to limit incentives for excessive lending and borrowing and to address any structural factors that may be contributing to high interest margins (e.g., high risk premium, high transaction or operational costs, tax distortions, etc.).

- Tightening fiscal policy further and maintaining a prudent stance would help counter the expansionary pressures that may be brought by credit expansion in some of the CEE countries. In a number of others, however, where the fiscal position is already tight, the authorities may find limited room to resort to fiscal measures. Where there are fiscal incentives that may be encouraging certain types of borrowing or lending (such as interest deductibility for mortgage loans, explicit subsidies or government guarantees for housing loans, interest rate subsidies, etc.), addressing these distortions would be an appropriate policy response.

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[19] Highly predictable exchange rates, combined with large domestic interest differentials that are inconsistent with the exchange rate regime, may create perceptions of low exchange rate risks and encourage foreign borrowing. On-lending in domestic currency creates exposure to direct foreign exchange risks, while on-lending in foreign currency to unhedged borrowers or those with no foreign exchange income raises exposure to indirect foreign exchange risks.

The key question is whether prudential and supervisory measures could substitute for monetary and fiscal policies in coping with rapid credit growth when the latter policies are not a viable option. When rapid credit growth (e.g., with excessive concentration in certain types of loans such as mortgages or in foreign-currency-denominated lending to unhedged borrowers) is generated by inconsistencies or distortions in macroeconomic/structural policies, the first best policy response should be to eliminate those distortions or inconsistencies. The use of prudential and supervisory measures should be genuinely justified on prudential grounds so as not to inflict undue burden on the supervisory authorities and banks. Given the inter-linkages between macroeconomic and financial concerns discussed above, prudential measures can be used to support macro policies to limit a deterioration of the quality of banks' assets, including when rapid credit growth is encouraged by incentives created by the macroeconomic policy mix.[20] Since prudential measures, also in these cases, are aimed at ensuring sound lending practices and maintaining the resilience of the financial system to adverse shocks, they need not automatically be relaxed when the threat to macroeconomic stability subsides.

The room for tightening further prudential/supervisory policies varies across the CEE countries. In many of the countries, the frameworks have been strengthened significantly and there may be limited room for further tightening. In others, efforts have been ongoing to strengthen the prudential and supervisory systems, although there is still room for improvement, particularly where there are weaknesses in banks' and supervisors' ability to assess and monitor the risks. Strengthening the capability of banks and supervisors to better assess and manage indirect exposure to foreign exchange risks is an area that needs to be addressed, specifically considering the large proportion of lending in foreign currencies and limited information on the degree of hedging by borrowers in many of the CEE countries. The type of prudential/supervisory measures that could be tightened, or introduced, would in general be guided by the nature of the risks associated with the nature of the credit growth (see Table 6 for a mapping from various features of the credit growth to different types of risks, and Table 7 for the prudential instruments that could be used to deal with each type of risk).

While supervisory and prudential measures alone may not lead to a significant reduction in credit growth, they could contribute to both limiting its growth and preserving banks' asset quality, if implemented along with appropriate macro policies. In fact, there are limits to what prudential policies can do in the absence of prudent fiscal policies, or if monetary/fiscal regimes persistently create perverse incentives that encourage credit growth. Prudential policies should hence be considered as part of a comprehensive package of measures to deal with rapid credit growth. Applied in this manner, such policies can serve to address

[20] Macro policies generally limit credit by raising the price—the interest rate—while prudential policies tend to make such lending decisions more expensive by raising the associated costs for the banks in the form of capital requirements, provisioning rules, and liquidity requirements, or limit the quantity through, for example, loan-to-value ratios.

distortions in bank lending associated with, for example, risky sectoral loan concentrations, unhedged currency borrowing, imprudent funding behavior by banks, or real estate bubbles. Appropriate disclosure requirements for banks of their risk management and internal control policies and practices can also strengthen market discipline, limiting imprudent lending practices.

Table 6. Key Risks Associated with Credit Growth

Aspects of Credit Growth	Type of Risk Associated
Speed of credit growth	• Credit risk (from inappropriate loan assessments, strain on ability to monitor and assess risks) • Macro risks
Main providers of credit (foreign versus domestic banks, etc.)	• Credit risk (from aggressive lending strategies) • Macro risks
Main borrowers (households, corporate sector, etc.)	• Credit risk (greater sensitivity of repayment capacity of corporate loans to the economic situation, that of consumer loans to collateral values) • Macro risks (likely impact of loans on the current account) • Market risks (sensitivity to economic activity and price changes)
Sectoral loan concentration/composition of credit (mortgages, durable consumer goods, investments, etc.)	• Credit risk (from concentration, collateral values for mortgages, etc.) • Macro risks (impact on the current account in the case of consumer/investment loans, etc.) • Market risks (e.g., sensitivity to real estate prices)
Currency composition of loans	• Direct (through banks' net open positions) and indirect (via borrowers') exposure to foreign exchange risk
Maturity of loans	• Maturity/liquidity risks (longer-term loans financed through shorter-term borrowing by banks)
Sources of credit	• Foreign exchange risk (loans funded by bank borrowing) • Maturity risks (when liabilities short-term, assets longer term) • Macro risks (from exposure to market sentiment)

Effective implementation of the prudential/supervisory measures requires an adequate enforcement capacity, cross-border supervisory cooperation, and an effective coordination between supervisors of nonbank financial institutions. Bank and nonbank supervisory coordination is essential to avoid loopholes (e.g., a shift away from bank lending toward direct foreign borrowing or borrowing from less well-regulated and supervised nonbank financial institutions, which perform quasi-bank activities and fall outside the regulatory

Table 7. Prudential and Supervisory Measures to Manage Key Risks of Rapid Credit Growth

Type of risk	Specific Measures
Credit risk	• Higher and/or differentiated capital requirements or application of risk weights based on loan type, maturity, and currency composition of credit; • Raising general provisions, incorporating various elements of risks (e.g., in foreign currency loans, offshore, derivatives, or other off-balance sheet activities) in loan classification and provisioning requirements (e.g., for banks with rapidly growing portfolios); or dynamic provisioning; • Tightening eligibility requirements for certain types of loans including through limits on loan-to-value ratios for certain loans (e.g., for mortgages or FX loans); • Tighter (or appropriate) collateral requirements (e.g., specifying assets eligible for collateral, marked-to-market asset valuation); • Rules on credit concentration (limits against large exposures to a single borrower or a group of related borrowers and against connected lending; and limits against credit concentration in particular industries, sectors, or regions); • Use of periodic stress tests of banks' balance sheets against interest rate, exchange rate, and asset price changes (by banks themselves as well as supervisory authorities); • More intensive surveillance and onsite/offsite inspection of potential problem banks; • Improved reporting/disclosure rules for banks' and their borrowers' balance sheets and banks' risk management, and internal control policies and practices; • Periodic and close monitoring of banks' foreign-currency-denominated (or indexed) loans to domestic customers, which do not have adequate sources of foreign exchange or are otherwise unable to hedge the risks involved, including through requirements to conduct periodic surveys of banks' and their borrowers' foreign exchange exposures.
Direct/indirect foreign exchange risks	• Tightening of net open position limits for banks to limit direct foreign exchange risks; • Imposing differentiated capital requirements or risk weights based on the currency composition of credit to limit indirect exposure to foreign exchange risks; • Incorporating unhedged foreign exchange exposure in the criteria for loan classification and provisioning rules; • Tightening eligibility requirements for foreign exchange loans, including by limiting such loans to borrowers with foreign exchange income or adequate hedging, to limit indirect exposure to foreign exchange risks; • Periodic stress testing of banks' balance sheets with respect to exchange rate changes (by banks themselves as well as supervisory authorities); • More intensive surveillance and onsite/offsite inspection of banks with a large share of foreign exchange lending in their overall portfolios, including to ensure that banks have appropriate internal procedures for risk measurement, assessment, and management; • Adequate monitoring of banks' direct and indirect exposure to foreign exchange risks through improved reporting/disclosure rules for banks and their borrowers' open positions in foreign currency or through a requirement to conduct periodic surveys of banks' and their borrowers' foreign exchange exposures (by banks themselves and/or by supervisory authorities).

Liquidity/ maturity risks	• Imposing differentiated capital requirements or risk weights based on the maturity composition of credit;
	• Maturity mismatch regulations (active management of maturity mismatches between bank assets and liabilities, with limits established against such gaps and limits on various instrument exposures incurred by the bank);
	• Use of periodic stress tests of banks' balance sheets under alternative scenarios for interest rate changes (by banks themselves as well as supervisory authorities);
	• Enhanced monitoring and reporting requirements on:
	  • the maturity structure of interest-sensitive assets and liabilities, broken down into several daily, weekly, monthly, and quarterly maturity "buckets";
	  • the maturity structure for each currency in which the bank has a substantive position; and
	  • the types of interest-bearing securities and their maturity breakdown;
	  • banks' liquid assets, expected future cash flows and liquidity gaps for specified future periods, and details of liquidity management;
	• Guidance to banks to avoid overreliance on short-term interbank borrowing and encouraging access to diversified funding bases in terms of sources of funds and the maturity breakdown of the liabilities, taking into account differences in volatility and reliability of domestic and external sources of liquidity.

Source: Johnston and Otker-Robe (1999), Delgado and others (2000).

framework).[21] Similarly, creating an effective dialogue with home supervisors of foreign banks (e.g., through memoranda of understanding bilaterally or multilaterally or regular exchange of information among supervisors) will be critical in many of the CEE countries where rapid credit growth is dominated by a group of foreign banks regulated and supervised by home-country authorities of parent banks. This is particularly concerning since incentives to expand market share are strong and the relatively small share of the domestic banking market in foreign banks' total portfolio makes their endeavor seemingly a low-risk strategy.

Beside these policies, it is important to promote a better understanding of risks, to help limit excessive risk-taking and potential deterioration in asset portfolios. Public awareness campaigns, press conferences, seminars/workshops, financial stability reports, and "consultative" meetings with banks could be used to warn borrowers and banks against risks of over-borrowing/over-lending (some of the CEE countries have already been using these tools recently, e.g., Bulgaria and Romania). Improving the credit culture, including through credit bureaus and registries, would also help enhance market discipline, while providing a valuable information base to monitor bank loan quality. Together with a better understanding of risks, availability and use of hedging instruments would help protect banks and their customers against risks associated with rapid credit growth. This would also help deepen financial markets and enhance capacity to cope with credit growth. Developing securities markets, for example, could reduce dependence on bank credit and provide banks with alternative assets to diversify risks.[22]

Finally, the authorities could consider administrative measures (such as capital controls on bank borrowing, direct credit controls, financial transaction taxes, etc.), but only as a last resort, if there are significant macroeconomic and prudential risks that justify curbing the amount or growth of credit, and market participants fail to respond appropriately to changing risks over time and to other instruments.[23] The decision regarding the use and timing of such measures would likely depend on the policymakers' perceptions and judgments on the vulnerability threshold of the perceived imbalances and risks. Although the probability of an adverse shock that may cause these risks to materialize may be small, the expected loss given a possible shock could be large and may prompt policymakers to take preemptive measures (in some cases drastic ones) in order to reduce the vulnerability of the system as a whole.

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[21] International Monetary Fund (2004c) points to greater challenges for financial sector regulators brought by growing integration across various types of financial institutions and by cross-border financial integration, and the need, in turn, for closer and more systematic monitoring of cross-border contagion risks and of opportunities for regulatory arbitrage.

[22] A supportive borrowing strategy by the government would be essential to ensure that banks would have the incentive to invest in such instruments.

[23] These measures are steps back in the process of financial liberalization that took place worldwide during the past decades; see Abiad and Mody (2003).

Since administrative measures are distortionary and entail costs (see, e.g., Alexander, Balino, and Enoch, 1995), including for the stability of the financial system that the measures intend to protect, a careful cost-benefit analysis is needed before such measures are adopted. Such analysis should take the potential risks into consideration and periodically assess the risk of circumvention through balance sheet manipulation by banks and borrowers switching to less supervised and monitored nonbank financial institutions for funding (direct credit controls were used in Croatia, for example, where such effects have been observed, and were subsequently removed). Imposing administrative measures may also send a negative signal of a lack of commitment to market-based policies, and the authorities should have sufficient confidence that the costs of resorting to such measures would not exceed their expected benefits. Since these measures likely have unintended and undesirable side effects, they should be temporary and designed to include some market-based features, to the extent possible, to avoid introducing long-lasting distortions and inefficiencies.[24]

V. Summary and Concluding Remarks

Rapid growth in credit to the private sector continues to be a key challenge for most of the CEE countries. The rapid pace of credit expansion in these countries, generally from a low base, is likely driven by a "catching up" process. It is supported by an upward revision in income expectations due to improving economic prospects, often related to the prospect of EU accession. On the supply side, foreign financial institutions entering these markets with the objective of rapidly gaining market share have often facilitated funding the rapid expansion of credit. For these foreign institutions, the exposure to any particular country is often still limited. All this, however, does not mean that the process is without danger, and in fact the pattern shows similarities to experiences of other countries where (over)optimism about future earnings led to a boost in asset valuations and a surge in capital inflows that allowed firms and households to borrow and spend.

Key macroeconomic implications of rapid credit growth include inflation and a weakening of the current account; in the CEE countries, the latter has been more prominent. Continued deterioration in external balances of the CEE countries may increase the risk of speculation against the currencies under the prevailing fixed exchange rate regimes. The low savings rates in most of the countries imply that they are highly dependent on the willingness of foreign investors to fund these deficits.

From a microeconomic perspective, it is not clear whether the credit risk systems of banks in the CEE market will be able to cope with a potential lending boom. In most of the CEE countries, the prudential indicators do not signal a significant vulnerability of the banking

[24] Reserve requirements on excessive credit growth or on banks' foreign borrowing (including from their parent banks), for example, may discourage excessive lending by making it more costly for the bank, rather than limiting credit outright.

system, but many of these are lagging and not leading indicators. Moreover, there have been some indications of a decline in capital adequacy and some increase in credit risks in many of the countries in the group. In these countries rapid credit growth—in particular in cases where the number of credit applications grows rapidly—has started to put a strain on banks' and bank supervisors' capacity to assess risks. Furthermore, a sharper-than-expected decline in interest margins, due to increased competition, may decrease the profitability of the banking system and increase its vulnerability.

These macroeconomic and microeconomic implications of rapid credit growth entail two different but interrelated risks. On the one hand, in a situation of continued macro instability (inflation and/or external imbalances), financial stability will come under pressure. On the other hand, financial instability—a weak and vulnerable financial system—will contribute to macroeconomic imbalances. Addressing these risks generally calls for a comprehensive policy response, in which monetary and fiscal policies should be supplemented and supported by prudential and supervisory policies.

The starting point for any policy response should be an assessment of credit growth on the basis of detailed underlying data. It is important to monitor and analyze a breakdown of aggregate credit data in terms of the borrower, the purpose of the loan, the currency denomination, and other relevant conditions of the loans. Such a breakdown is necessary for an assessment of the possible macroeconomic as well as financial stability risks involved. Without such a comprehensive assessment, it will generally not be possible to determine whether and when an observed rate of credit growth is a cause for concern, given the difficulties in assessing the appropriate rate of growth in countries experiencing substantial structural change. The assessment should also include macroeconomic, macroprudential, and structural factors, including the existence of macroeconomic imbalances, the soundness and strength of the financial system, the effectiveness of supervision and regulation, the structure of the financial system, and the financial health of borrowers.

Once the need for a policy response has been established, the authorities can draw on a variety of instruments at their disposal, and many of the countries in the region have in fact resorted to a number of measures in response to rapid credit expansion. The effectiveness of these measures has varied and has been affected by a number of factors, including the openness of the capital account, the degree of euroization of the economies, the adequacy of monetary instruments and the effectiveness of monetary policy transmission, as well as the fiscal position.

Looking forward, for most countries in the region there seems to be room to use a combination of macro and prudential measures to address causes as well as consequences of credit growth. Monetary policy could be used effectively, provided that efforts are put into developing effective market-based monetary instruments and to eliminating obstacles to a smooth functioning of the transmission mechanism. Yet for other countries, the set of available measures may be more limited due to their specific characteristics. In particular, in some of the CEE countries the ability to use monetary policy is constrained by the prevailing exchange rate regimes and the openness of the capital account. Fiscal policy can also be used

to reduce demand pressures. However, the scope for a fiscal policy response may be limited in cases where the fiscal position is already relatively strong and overfunding is politically difficult.

It is clear that the use of prudential measures needs to be justified by prudential considerations, with a particular focus on ensuring sound lending practices. This should be the case regardless of the rate of credit growth. As noted above, in cases where there exist serious concerns about macroeconomic stability, that is likely to have a bearing on financial stability as well. If so, prudential and supervisory measures can support macro policies to stem credit growth. The supervisory authorities first need to make sure that the existing prudential and supervisory rules are adequately enforced. Additional prudential and supervisory measures could be introduced depending on the types of risks involved. In order to ensure the effectiveness of these measures, there should be effective coordination between the supervision of bank and nonbank financial institutions as well as close and strong cross-border supervisory cooperation. The exposure of foreign banks to individual CEE countries may be small, but to the region as a whole it is rapidly growing, which makes cross-border exchange of information and cooperation between supervisors a key requirement.

Moreover, it is essential to promote a good understanding of risk, including through public awareness campaigns against overborrowing and overlending. This applies in particular to borrowing in foreign exchange, where foreign exchange risks for unhedged borrowers can easily translate into credit risks for the banks. Credit bureaus can help banks' assessment of the quality of borrowers. Furthermore, further developing financial markets in these countries would help improve the transmission mechanism, as well as facilitating hedging by banks and their customers against various risks associated with credit growth. Developing financial markets, including securities markets, could also provide banks with alternative investment opportunities and reduce the pressure on lending.

Administrative measures should be considered only as a last resort. Since these measures have unintended and undesirable side effects—such as impeding competition and circumvention through nonbank and foreign institutions, as well as undermining market confidence—they should at most be imposed temporarily and designed carefully to avoid introducing long-lasting distortions and inefficiencies. Also in this case, effective coordination between of bank and nonbank supervision and cross-border supervisory cooperation would be critical to ensure the effectiveness of such measures.

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Data and Methodology

Data

The dataset is comprised of two groups of countries: a focus group and a benchmark group. The focus group is a set of 18 countries defined as having been involved in the transition process from centralized planning to a market economy, primarily located in Central and Eastern Europe. The focus group forms a panel of annual data from 1990 to 2004. The benchmark group is a panel of annual data of 37 countries through the period 1980–2004. The benchmark group was selected from countries within the Organization for Economic Cooperation and Development (OECD) that have experienced above average economic growth and countries that did experience rapid credit growth during the period. Financial crisis countries are those countries which Caprio and Klingenbiel (2003) identified as having experienced systemic banking crisis during 1980–2003.

Most variables in the sample were obtained from International Financial Statistics (IFS). Measures of GDP and CPI were taken from the World Economic Outlook Database. Financial soundness indicators were taken from an IMF database.

Bank credit to the private sector is measured as claims that commercial banks have on the private sector, i.e., line 22d in the IFS, and GDP in current prices of each country's national currency. Note, however, that line 22d is a conservative measure of credit. Credit extended by leasing companies and other nonbank financial institutions is not included. Due to lack of data in various countries, as well as to permit cross-country comparisons, line 22d has been used to assess credit expansion in the countries covered in the paper.[25] Since credit is a stock variable and GDP is a flow variable the ratio is determined by bank credit to the private sector at the end of time t divided by the simple average of GDP over time t and t+1:

$$Credit\_ratio_t = \frac{BCPRS_t}{(GDP_t + GDP_{t+1})/2}$$

How to detect credit booms?

The study follows the method developed by Gourinchas, Valdes, and Landerretche (2001) when identifying credit booms and rapid credit growth episodes. In order to determine the cycles, they establish a trend of credit to GDP over time, using the recursive (or rolling) Hodrick Prescott filter ("HP filter"). The HP filter decomposes a series into a trend (x_t) and a

[25] Country reporting of credit extended to the economy varies substantially. Using only line 22d as a measure of credit to the private sector may, of course, underestimate the extent of credit growth, where most credit to the private sector is intermediated by leasing companies and other nonbank financial institutions (as in the case of Romania, for example).

stationary component (y_t-x_t), where y_t represents the actual credit ratio, by choosing x_t such that the following formula is minimized (Hodrick and Prescott, 1997):

$$\min\left\{\sum_{t=1}^{T}(y_t - x_t)^2 + \lambda\sum_{t=2}^{T-1}((x_{t+1} - x_t) - (x_t - x_{t-1}))^2\right\}$$

λ is a smoothing parameter, usually set at 1600 for quarterly data and 1000 for annual data. If $\lambda = 0$, x_t will be minimized when $x_t = y_t$.

The recursive HP filter sets a trend at each data point by de-trending the first 5 years, then calculating a trend for the first 6 years, and another for the first 7 years, etc. The last trend point for each exercise makes up the trend for the whole series. This method enables the policymaker to identify whether a boom has occurred up until the time a decision has to be made, hence identify where the economy is located in the cycle at any given point in time.

Gourinchas, Valdes and Landerretche (2001) calculate the relative difference and absolute difference between the actual series and the trend, where the relative difference equals $\frac{(y_t - x_t)}{x_t}$. In our analysis, we opted for the relative difference approach rather than the absolute difference, to take into consideration the level of financial deepening in assessing how concerning credit growth could be (e.g., a rise in private credit to GDP from 10 percent to the 20 percent will have a much different expansionary effect on macroeconomic variables than a rise from 100 percent to 110 percent).

To identify the start of a rapid credit growth episode and a possible boom in credit extended to the private sector, Gourinchas, Valdes and Landerretche (2001) set an arbitrary limit threshold at 5 percent relative difference and 2 percent absolute difference. They rank in a descending order the relative and absolute difference of all observations in their dataset and set a cut-off point for the credit boom at the 60th highest deviation, the 80th and the 100th cases, which yield cut-off points in terms of relative difference at 24.0 percent, 19.5 percent, and 16.4 percent of relative difference, respectively. The observations that exceed the threshold made by the cut-off points are identified as booms. The cut-off points for our dataset are at 34.5 percent, 28.0 percent, and 22.2 percent for the 60th, 80th and the 100th case; hence all observations with the relative difference exceeding 22.2 percent are considered as booms in our analysis.

A word of caution may be warranted regarding the identification process. The method described above, although widely used, has certain shortcomings. The identification of a boom in a given country is highly dependent on the dataset at hand. Should one particular country experience a profound and longlasting credit boom, it may crowd out credit booms in other countries from the list of 60, 80, or 100 cases that the method suggests. That indeed was observed as the credit crisis in the Nordic countries in the late 1980s and early 1990s were not included in the 100 case list as the data from 1980-2004 were explored. Our examination provides evidence that the cut-off point, which defines the limit threshold, has

risen over time, hence the credit expansion in the Nordic countries is not defined as a boom in our exercise.

Furthermore, if an output shock occurs but credit remains unchanged, one may detect a credit boom where there is no such boom. Further work is needed to develop a methodology to identify credit booms which takes the above mentioned weaknesses into account.

The Nature of Credit Growth in the Group of Countries with Rapid Credit Expansion[1]

	Speed of Credit Growth	Signs of Macroeconomic/ Financial Stress?	Main Providers of Credit	Sectoral Loan Composition	Loan Currency Composition	Maturity of Loans	Funding Sources of Credit
Belarus	Accelerating growth of credit, particularly fast since 2003 (>40% in real terms at low levels of financial deepening (9% in 2000-04)	Strong GDP growth with high but somewhat falling inflation and moderate current account deficit. Strong growth fueled by consumption boom driven in turn partly by strong credit growth; government guarantees to support bank loans rose sharply in 2004. Vulnerabilities in the banking sector (with exposure to various risks, low profitability, weaknesses in loan classification regulations/practices, weak loan recovery and creditor rights' protection, difficult enforcement, limited ability to price risks given limits on lending rates).	Foreign participation is 21% of the assets of commercial banks as of mid-2004.	Many banks apparently have sectoral lending concentration (e.g., agriculture, industrial sector, etc.). Overall, largest share in loans belongs to industry (38%), and households (20%)	About half of bank loans to residents are denominated in foreign currency; indirect exposure to FX risk by un-hedged borrowers. FX loans rose by 32% y/y in October 04. FX liabilities at about 40% of total liabilities.	On balance short-term (28% of assets and 8% of liabilities are long term), though with variations across banks; some state banks have interest rate and liquidity exposure. Liquid assets to short term liabilities at 58% in mid-2004, below prudential minimum of 70%.	Financed mainly by a strong deposit base.
Bulgaria	Very strong growth since mid-2001 (32% in real terms in 2000-04) at a still relatively low level of financial deepening (20% over the same period—but second largest rise in credit/GDP ratio since 1999)	No apparent sign of inflation, but a sharp deterioration in current account; strong import growth. Prudential indicators appear strong, though capital ratio has been falling, with some banks close to the minimum required; latest stress tests imply a rise in vulnerability of a large number of banks (maturity risks and indirect FX risk).	Banking sector dominates financial sector; credit growth mainly driven by foreign banks with asset market share of 80%. Foreign banks lending aggressively to raise market share.	Commercial loans (70% of total), consumer loans (20%), residential mortgage loans (5%), with fastest growth in the latter two (over 50% and 100%, respectively).	About 46% of total bank loans are FX denominated as of end-September 2004 (from 35% in 2000).	About 75% of total credit is extended at maturity>1 year with the share of 5 year loans rising in the last two years, suggesting rising liquidity risks.	Mainly the sharp rise in deposits (esp. FX deposits), and banks' foreign liabilities (drawing down of foreign assets and borrowing from parent banks)
Croatia	Following a sharp rise in bank credit from 2001-03, credit growth slowed down sharply; but has the third largest rise in credit to GDP since 1999	No major sign of inflation, but sharp deterioration of the current account. Increase in net open positions since 2001 and exposure to indirect FX risks, with most borrowers unhedged; higher credit risk (hh credit); fall in capital ratios since 2001 (though still high)	Asset market share of foreign banks at 90% at end-2003.	Household credit (49% of total and grew markedly); enterprise loans (40%) at end-2003; some rise in the former's share.	While the share has fallen since 2000, FX denominated lending still make up 75% of total loans.	n.a.	Growth of credit supported by a strong deposit base growth, foreign borrowing from abroad, and easier monetary policy.
Estonia	Bank credit has been rising persistently since 1999, over 30% in real terms since 2003, with a sharp rise in credit to GDP since	Strong GDP growth with low inflation, but a sharp deterioration in the current account deficit. Banks highly capitalized, profitable, low NPLs. But potential risks from rapid growth of household credit and indirect FX	About 90% of bank assets are foreign owned. These banks have been lending aggressively to gain market share, putting	Household loans growing (28% of total in 2003); share of corporates falling (34% from over 50% in 1999);	Share of FX denominated lending has been rising, close to 60% in 2003; extent of hedging	n.a.	Steady rise in bank deposits and a rapid rise in banks' net foreign liabilities (particularly since 2002).

	Speed of Credit Growth	Signs of Macroeconomic/ Financial Stress?	Main Providers of Credit	Sectoral Loan Composition	Loan Currency Composition	Maturity of Loans	Funding Sources of Credit
	1999.	exposure.	pressure on loan rates	all sectors grew.	unknown.		
Hungary	Rapid growth of credit during 2001-03, with some deceleration since 2004, but a rapid rise in credit-to-GDP ratio.	Steady economic growth with slowdown in inflation, but with a significant deterioration of current account deficit (8.9%). Banks highly capitalized, profitable, low NPLs. But potential risks from rapid growth of household credit and indirect FX exposure.	Banks mostly private (about 90%). About 2/3 of bank assets are foreign owned.	Corporate sector loans have the largest share, but household credit (incl. mortgage loans) accounted for most of the credit expansion.	Share of FX credit remained around 30% of total credit; some reported reluctance by the corporate sector to hedge FX risks.	n.a.	Financed mainly by a steady deposit base, and some increase in net foreign liabilities of banks.
Latvia	Persistent rise since 1999 (over 30% in real terms since 2001), also with the largest rise in credit-to-GDP (28 percentage points).	Strong economic growth with low inflation; current account deficit, however, remains very high (about 9% in 2003), with external debt (esp. short term increasing. Banking sector highly capitalized, profitable, low NPLs, with small direct, potentially large indirect FX exposure.	Financial sector dominated by banks (mostly private); foreign ownership at 70% of capital and asset share at 54%. Competition creates pressure on margins.	Credit to corporates (the largest share) rose sharply since 2000. Mortgage loans also rose sharply from a low base, doubling its share.	More than 50% of the loans are FX-denominated.	More than 80% of loans in long term, suggesting vulnerability to liquidity risks.	Steady rise in bank deposits (almost doubled to 27% of GDP) and rising net foreign liabilities (part. since mid-2001).
Lithuania	Persistently strong growth since 2001 (over 30% per annum from 2002, with some sign of easing during 2004); large rise in credit/GDP ratio.	Strong economic growth with very low inflation; current account deficit, however, has been deteriorating (about 7% in 2003), with non-FDI component rising. Banking sector highly capitalized, profitable, falling NPLs, with small direct, but potentially significant indirect FX exposure.	Financial sector dominated by banks (fully private); of which foreign banks with 89% of asset share at end-2003 and 90% of share capital.	Majority of loans to corporate sector (69% in 2001); but consumer loans (at 21% of loans) rose rapidly since 2001.	53% of loans FX-denominated but fell from 2000-01 levels; rising FX loans to corporate sector. Consumer loans mainly in domestic currency.	About 73% of loans in long term, suggesting vulnerability to liquidity risks.	Strong growth in bank deposits and increasing net foreign liabilities, with increasing credit lines form parent banks.
Moldova	Rose strongly from 2000; around 30% in real terms in 2002-03, also with some sign of deceleration in the rate during 2004.	Strong economic growth with relatively high inflation; current account deficit remains large (about 7% of GDP). Banking sector indicators broadly favorable, with some weaknesses in bank risk management capacities and potential for deterioration in the process of credit approval. The central bank has established a loan classification category ("loans under supervision"), requiring 5% provision; loans in this category represent 35.3% of total loans, potentially signaling future problems.	Foreign and state ownership low (3 and one out of 16 banks, respectively). Foreign banks make up about 38% of total assets in 2003.	Industrial/ commercial loans (46%), real estate (6.6.%), consumer loans (2.7%) (in 2003).	Stable around 42% of total loans in 2003. Banks' FX liabilities are 49% of total liabilities. Banks are not allowed to lend exporters, but can extend FX loans to importers without FX income.	Ratio of liquid to total assets low at 32%.	Banks use a large share of their foreign currency resources for lending, instead of holding foreign exchange deposits in correspondent accounts, being exposed to FX risks.
Romania	Credit has been rising at a strong rate since	Strong economic growth with relatively high inflation. Current account deficit	Financial sector dominated by banks.	Consumer and mortgage loans	FX-denominated loans at 75% in	About 50% of loans in long term—small	Mainly by a steady growth in deposits,

	Speed of Credit Growth	Signs of Macroeconomic/ Financial Stress?	Main Providers of Credit	Sectoral Loan Composition	Loan Currency Composition	Maturity of Loans	Funding Sources of Credit
	2001, at a rising but still low level of financial deepening (7.8% of GDP in 2000-04).	remains relatively high. Banking sector highly capitalized, profitable, some rise in NPLs. Direct FX exposure of banks limited, but potential indirect FX exposure, due to large FX denominated lending and unknown extent of hedging.	Asset market share of foreign banks 58%. Share of foreign ownership at 33% in mid-2003.	rose rapidly; household loans at about 22% of total, and 70% of which is mortgage loans	2003; 30% of loans to house-holds and 65% of loans to business sector are FX denominated.	liquidity mismatch	and some increase in net foreign currency liabilities.
Serbia	Private sector credit has been rising very rapidly since 2002, with 28% real growth in 2003 albeit from a low base (17% of GDP).	Moderate growth with relatively high inflation; deteriorating current account deficit; rising imports believed to be fed by rapid credit growth. Signs that this is putting strain on bank risk management. Banks are not FX-exposed on a net basis, but indirect FX exposure likely significant.	Most lending is by foreign banks that are well-capitalized, get long-term funding from headquarters but with Serbia making a small share of their portfolio.	Consumer loans rose by 93% in 2003 in real terms.	Almost all loans are denominated in or indexed to foreign currency.	n.a.	Rapid growth of foreign currency deposits, and a surge in foreign loans to banks in Serbia.
Slovenia	Credit has been rising at a moderate but steady pace since 2003, with a significant rise in financial deepening since 1999.	Moderate growth with some fall in inflation. No significant external problem. Banking sector relatively well-capitalized, profitable, stable NPLs. While banks argue that FX loans are mostly to exporters, degree of indirect FX exposure unknown.	The share of foreign ownership is low (about 35%) with ¾ of banks private.	Loans to both corporate and households sector grew rapidly, with about 2/3 of credit to the corporate sector.	About 4/5 of the expansion in credit to corporate sector was in foreign currency, financed by higher bank foreign borrowing.	About 61% of loans in long term, suggesting some vulnerability to liquidity risk.	Mainly by a steady growth in deposits, and some increase in net foreign currency liabilities.
Ukraine	Persistently strong growth (39% on average, with some recent deceleration); a sharp rise in credit-to-GDP to a still relatively low level—26%)	Strong growth with moderate inflation; current account has been in surplus. Banking sector strengthened in recent years but some vulnerability remain (high credit risk with high NPLs, direct/ indirect exposure to FX risk, some maturity risk, need to increase capital further, widespread related lending practices).	Foreign ownership is quite low (about 13% of capital)	Majority of loans is to enterprises while consumer lending has also risen significantly in recent years.	Significant FX-denominated lending (about 38% in 2004), incl. to borrowers with no significant FX earnings and hedging.	Less-than-balanced lengthening of funding of FX loans compared with maturity of FX loans.	Mainly by steady growth of bank deposits (except recently); since late 2003 also by higher bank borrowing from abroad (with a sharp fall in banks' net foreign assets).

Sources: International Financial Statistics, Lukonga and Nakamura (2003), various country reports, and World Economic Outlook.
Explanation: FX = foreign exchange.
[1] Based on information available as of March 2005.

Policy Options to Cope with Rapid Credit Growth

Measures	Impact	Limitations	Examples where they have been used	Appropriate situation to apply
I. Macroeconomic Measures				
• Fiscal measures: tightening fiscal policy; reducing distortions that may create incentives for borrowing or certain types of credit (e.g., interest rate deductibility of mortgage loans, explicit subsidies/ guarantees for housing loans).	• Help reduce overheating pressures that may be associated with credit expansion. • Reduce structural distortions that bias economic incentives.	• Task of restructuring government spending or broadening tax bases may be difficult in the short run and may not be available as a quick measure to deal with emerging problems. • Limited room for maneuver if fiscal position is already fairly tight. • Potential political resistance given output costs that may be associated with significant tightening.	Bulgaria (further tightening of fiscal stance); Croatia, Romania; Estonia (limited mortgage interest deductibility); Netherlands (reduced tax relief on mortgage payments)	• When rapid credit expansion creates overheating pressures that may undermine macro-economic/external stability; • Especially when ability to use monetary policy tools is limited or nonexistent.
• Monetary measures	Reduce liquidity in the banking system to contain/counter the expansionary impact of credit expansion.	• Face constraints depending on the type of the monetary regime (e.g., under currency board arrangements, currency unions, etc., there may be incentives to build unhedged foreign exchange positions which help finance credit growth, and monetary autonomy is limited at best).	See below.	• To reduce overheating pressures that may undermine macro-economic external stability; • When the underlying monetary regime does not limit/preclude use of monetary instruments.
• Reserve requirements (changes in the level, eligible assets, and eligible liability base associated with the requirement).	• Help to induce demand for reserves and hence enhance predictability of reserve demand. • Increase in the requirement can be useful in one-off sterilization of excess liquidity or otherwise to accommodate structural changes in demand for reserves.	• High requirement is a tax on financial intermediation and a source of spread between lending and deposit rates, potentially reversing financial deepening. The adverse effect could be reduced, e.g., if the tax it imposes is neutralized through reserve remuneration at market rates, but at the expense of limited effectiveness on credit growth. • Could push financial intermediation offshore where there may be a more favorable regulatory environment. • Affect all types of credit (do not address distortions between different credit categories, unless different ratios imposed). • With an open capital account and ability to borrow from abroad, including by banks from their parent banks, they cannot be effective in reducing liquidity unless the base of the requirement is broadened to cover such liabilities. • Not convenient for short-term liquidity management as frequent changes can disrupt bank portfolio management.	• Used in many countries but active variation for policy purposes declined in industrial countries. • Recently used in Bosnia, Bulgaria, Croatia, Latvia, Moldova, and Romania in dealing with rapid credit growth.	• Could be effective temporarily when reserve requirements are the most effective monetary instrument to affect liquidity and when designed appropriately in a way to minimize loopholes for circumvention.

Measures	Impact	Limitations	Examples where they have been used	Appropriate situation to apply
		• There is a risk that the rise in the cost of capital through RR could encourage banks to focus their lending on high risk-high return projects rather than higher quality customers. • Discriminates against banks vis-à-vis nonbanks.		
• Liquid asset requirements/ (LARs)/statutory liquidity ratios (introduction or tightening).	• Could provide "sand in the wheels" against rapid lending, provided they are carefully designed: by forcing banks to hold funds in liquid assets, help reduce total potential loans, if effective.	• Adverse impact on financial market development by creating a captive market for certain papers, distorting interest rate structure, hence affecting monetary transmission mechanism and stifling secondary trading. Hence inefficient and distortionary as a monetary policy tool and not a desirable instrument for liquidity control purposes. • Could reduce fiscal discipline, thereby losing effectiveness as means to control money. • Distort competition by constraining bank asset management. • By imposing a tax on financial intermediation, a high LAR may reverse the process of financial deepening, pushing financial intermediation offshore where there may be a more favorable regulatory environment. • Unlikely to be effective beyond the very short term as banks may attempt to circumvent them (at least to some extent) through creative accounting practices, by borrowing from abroad under an open capital account (including by banks directly from their parent banks abroad), unless such liabilities are included in the base of the requirement. • There is a risk that the rise in the cost of capital through LAR could encourage banks to focus their lending on high risk-high return projects rather than higher-quality customers, affecting asset quality and financial stability.	Croatia, Iceland, Singapore	• May be effective in controlling lending capacity of banks if designed properly, with appropriate choice of eligible securities, eligible maturities, and averaging methods. • May be helpful in short-term liquidity management when proceeds of security sales are sterilized (as in Singapore).
• Tightening of monetary policy (e.g., rise in key policy rates).	• By transmitting the higher policy rates to bank lending rates, could help slow down demand for credit. • Could help reduce the impact of credit expansion on inflation and current account (i.e., the overheating pressures).	• May have the unintended effect of stimulating capital inflows that may further support credit growth, in particular under relatively open capital account. • Limited effectiveness if monetary transmission mechanism is not working properly (i.e., changes in key policy rates are not reflected to lending-deposit rates to affect lending). • Limited room to affect interest rates under certain monetary regimes, such as currency boards, unions, or rigid pegs, with limited room at most for monetary autonomy. • Negative impact on fiscal position by raising the cost of borrowing for the government.	Croatia, Iceland, Latvia, Romania	May be more effectively used under a relatively closed capital account, and where monetary transmission mechanism is working properly, as well as when there is supportive fiscal situation.

Measures	Impact	Limitations	Examples where they have been used	Appropriate situation to apply
• Shifting of government deposits in commercial banks to the central bank.	• Would have a direct impact of reducing bank liquidity available for lending.	• Likely to have only a short-term and limited impact on its own as banks could find resources through other sources to support bank lending (foreign borrowing, private sector deposits, etc.).		Could perhaps be helpful as part of a package of other measures aimed at reducing banks' ability to lend.
• Increasing the flexibility of exchange rates.	• May help limit inflows of capital, attracted by the relative predictability of the exchange rate that may provide funding to finance banks' lending. • Could help counter inflationary effects of credit growth by putting downward pressure on prices via appreciation.	• May be associated with greater exchange rate volatility, particularly in thin, shallow markets that may have some undesirable effects on competitiveness or private sector balance sheets.	Poland, Romania	• It may be an appropriate measure when rapid credit growth is stimulated by perceptions of low exchange rate risk provided by highly predictable exchange rate path. • Could be useful to deal with both macroeconomic (by limiting overheating pressure on the economy) and prudential concerns (by reducing incentives to build unhedged FX positions).
• Maintaining a consistent monetary-exchange rate policy mix (monetary policy set consistent with the exchange rate regime: e.g., if the exchange rate is pegged, interest rates set based on those in the anchor country).	• Limit incentives for excessive foreign currency borrowing stimulated by high domestic interest rate differentials and stable/ predictable exchange rates.		Poland, Romania	• When rapid credit growth is financed by increased borrowing from abroad and banks and their customers are building unhedged FX positions under perceptions of little/no FX risk.
II. Prudential Regulation and Supervisory Measures	• Strengthening prudential regulation/supervision can limit macro-prudential risks and hence contribute to the resilience of banks to adverse shocks. Supervisory techniques can help address distortions in lending that are associated with real estate bubbles, sectoral loan concentrations, unhedged	• Needs to be justified by financial sector stability concerns. • Ability for effective regulation and supervision may be limited unless there is significant cross-border supervisory cooperation (e.g., including with parent supervisors). • Supervisory and prudential measures alone may not lead to a reduction in credit growth but rather aim at maintaining asset quality. • There are limits to what prudential policy can deliver in the absence of a prudent and consistent fiscal, monetary, exchange rate policy mix. • The impact of prudential policy will also be limited by the	See below	• In general, use of such measures may be warranted when there are serious systemic risks for the financial and real sectors of the economy, and/or when there is a need to preempt potential financial sector difficulties, including to ensure that macroeconomic policy inconsistencies do not

Measures	Impact	Limitations	Examples where they have been used	Appropriate situation to apply
	currency borrowing, or imprudent external funding behavior by banks. • Less distortionary and intrusive and more market-based compared with direct/ administrative measures.	scope for disintermediation and direct cross-border borrowing as a loophole, particularly for households and domestic borrowers such as large firms. • Concern about further tightening may create incentives for changing the structure of domestic banks, from subsidiaries to branches and pushing business to less monitored and/or less supervised nonfinancial institutions.		end up causing a deterioration in soundness of banks' financial condition.
II.A. Prudential Measures				
• Higher and/or differentiated capital requirements or risk weights based on loan type, maturity and currency composition of credit; incorporation of market and other risks in capital adequacy ratios.	• Help reduce total lending capacity. • Enhance resilience of banks' capital base against adverse shocks to the system.	• Raising capital ratios may not be effective in countries where such ratios are already at well above Basle requirements. • There is a risk that the regulations may get overly complicated and enforcement cumbersome, undermining the effectiveness of the system.	Bulgaria, Bosnia, Croatia, Norway (raised capital requirements on certain categories of loans in the late 1990s), Poland, Ukraine (to some extent)	• Would be effective in countries where the existing ratio is not already unbinding (that is, already well above Basle requirements). • Would be effective if certain risky categories of lending have been rising very rapidly and raising systemic risks.
• Tighter/differentiated loan classification and provisioning requirements (e.g., for banks with rapidly growing portfolios, or imposing differential provisioning requirements for different types of loans, raising general provisions, etc.).	• Help reduce total lending capacity by requiring greater resources to allocate to provisioning. • Enhance resilience of banks' capital base against adverse shocks to the system.	• May not be effective where such requirements are already tight compared with international standards. • Excessive application may reduce the profitability of the banks, risking disintermediation. • There is a risk that prudential regulations may get overly complicated and enforcement cumbersome, undermining the effectiveness of the system.	Bulgaria, Croatia, Romania, Ukraine	Would be effective where there is room to tighten the regulations (i.e., the existing system has weaknesses) and where there are macro prudential risks associated with the particular patterns of lending.
• Dynamic provisioning [1] (accounts for the phase of economic cycle in calculating loan-loss provisions and limits their procyclical behavior, with quarterly loan-loss provisions	• Additional provisions set aside in lending booms, rather than in downturns when loan quality worsens; seeks to moderate upswing of a credit cycle, ensure prudent reserves for downswings.	• Not compatible with the international accounting standards (IAS 39) that the EU plans to implement in 2005. • Not as simple and transparent, since provisions are calculated based on averages over a cycle and as it may be difficult to estimate the amount of provisioning. • Requires confidence that future declines in provisioning will follow the same pace as past decreases and assumes losses in the next business cycle will be the same on average as in the	Spain	Easier to implement in stable markets with long data series and stable provisioning levels, and where incompatibility with IAS39 is not an issue.

Measures	Impact	Limitations	Examples where they have been used	Appropriate situation to apply
reflecting average losses over a business cycle).	• Provisioning that looks at borrowers over the cycle would reduce fluctuations in bank profits and lending, helping to reduce risk of financial instability. • Provides incentives for better pricing, risk management and appraisal and internal models	last business cycle.		
• Tightening eligibility requirements for certain types of loans including through limits on loan-to-value ratios (e.g., mortgages), limiting FX-denominated loans to those with FX income or adequate hedges.	Help avoid very high levels of mortgage leverage, to avoid risks in market behavior or asset prices.	• May raise the risk of borrowers switching to alternative sources of funds from unregulated/weakly regulated nonbank financial institutions.	Hong Kong, Romania, Singapore	Could be a very effective tool to reduce bank lending, provided that reporting requirements are adequate and supervision of banks and nonbanks are well-coordinated to limit risk of circumvention.
• Tight/adequate collateral requirements (e.g., specifying assets eligible for collateral, marked-to-market asset valuation).	Protects banks' asset portfolios against a deterioration in loan quality and risk of asset price bubbles, thereby increasing the resilience of the banking system.	Does not in itself lead to a reduction in rapid credit growth, though helps a more prudent allocation of credit.	Ukraine	Effective instrument to increase the resilience of banking systems against bad shocks, where legal system works properly and efficiently.
• Rules on credit concentration (limits on large borrowers, related lending, sectoral concentrations).	Help limit excessive expansion of credit to risky sectors and ensure diversification of sectoral/single borrower risks.	Limited effectiveness in slowing credit growth if banks could engage on window-dressing activities and where there are difficulties in identifying related parties.	Ukraine (efforts to strengthen rules against connected party lending)	Effective to increase resilience of banking systems where such concentration is an existing problem.
• Tightening of net open position limits and other prudential regulations against foreign currency denominated lending.	Help limit exposure to direct (through net open position limits) and indirect FX rate risks (i.e., credit risks associated with banks' exposure through borrowers' FX positions).	• Net open position limits by themselves would not help if banks are hedged in their FX positions; hence if not accompanied by regulations protecting against indirect FX risks. • The latter also would not help slow down credit growth or address its negative consequences, if FX denominated lending is not a significant part of banks' portfolios.	Bosnia (tightening FX exposure regulations, including off-balance sheet activities)	Where banks are borrowing significantly from abroad to finance rapid expansion of credit and where FX denominated lending is a significant part of banks' loan portfolios.
• Maturity mismatch	Help limit exposure to interest			Where there is significant

Measures	Impact	Limitations	Examples where they have been used	Appropriate situation to apply
regulations.	rate and liquidity risks, increasing the resilience of bank balance sheets vis-à-vis market risks.			mismatch between the maturity of banks and their borrowers' assets and liabilities.
II. B. Supervisory/ Monitoring Measures		May in general adversely effect financial intermediation if tightened excessively and may lead to disintermediation toward cross border flows or nonbank financial sector activity which is not in general regulated/supervised. May lead to a move from foreign subsidiaries (which can be made subject to regulation/supervision) to foreign branches (supervision/ regulation of which will require cooperation with parent banks)		In general, appropriate where there are weaknesses in the supervisory system, systemic risks for financial and real sectors, and/or when there is a need to preempt potential financial sector difficulties, particularly if there is concern that the speed of credit growth puts additional strain on an otherwise strong system.
• Use of periodic stress tests of banks balance sheets w.r.t. interest rate, exchange rate, and asset price changes (by banks themselves as well as supervisory authorities).	Provide a systematic tool to assess risks and continued monitoring and assessment of capital adequacy of the financial institutions. Market based, less intrusive supervisory tool.	Should be done by bank supervisors as well as banks themselves, not to have a limited impact due to potential limitations in the capability of banks' to conduct such tests. As the sophistication of the banking system increases, such tools may not be adequate by themselves, but may need to be accompanied with other sophisticated methods (risk metrics to perform VAR analysis, credit scoring models, etc.).		Appropriate in any circumstances to systematically identify, assess, and manage risks in the financial system.
• More intensive surveillance and onsite/offsite inspection of potentially problem banks.	Provide a systematic tool to have close monitoring of bank balance sheets, risk assessment and management capabilities to identify risks on time.	Potential strain on supervisors' resources and capability to do adequate assessments especially in an environment with a large and rapid expansion of bank credit.	Bulgaria, Croatia, Estonia (close monitoring of credit developments)	Appropriate under any circumstances to systematically identify, assess, and manage risks in the financial system.
• Improved reporting/ disclosure rules for banks and borrowers' balance sheets, risk management, internal control policy.	Improve market discipline on banks and transparency of the financial system, limiting room for aggressive lending practices.	Existence of legal limitations on disclosure such as bank secrecy laws, etc.	Croatia, Poland	Appropriate under any circumstances to systematically identify, assess, and manage risks, particularly where financial system is characterized by non-transparent lending practices.
• Guidance to banks to avoid overreliance on short-term interbank	Help limit maturity and liquidity risks associated with excessive accumulation of short-term borrowing.	Effectiveness depends on how forceful these guidelines are. May require repeated monitoring and assessment of banks' balance sheet positions through disclosure and reporting requirements and on site inspections.		Where there is significant mismatch between the maturity of banks and their borrowers' assets and liabilities.

Measures	Impact	Limitations	Examples where they have been used	Appropriate situation to apply
• Requirement to conduct periodic surveys of banks' and their borrowers' foreign exchange exposures (by banks themselves or by supervisory authorities).	• Help banks and supervisors better monitor and assess overall unhedged exposures of borrowers and hence banks' indirect FX exposure. • Also increases transparency, facilitates identifying risks.	None.	Israel, New Zealand, Poland	Where there is significant currency mismatches in banks' and/or their borrowers' assets and liabilities and banks' own risk assessment and management capabilities are weak and inadequate.
• Strengthening the coordination of bank and nonbank supervision.	Helps monitor the potential risk of prudential and supervisory measures on banks from being circumvented through greater lending activity by less regulated nonbank institutions.	None, except, strengthening capability of regulatory and supervisory institutions may take time.	Croatia (plans ongoing), Greece	Particularly relevant where there are many nonbank financial institutions that are performing quasi-bank activities (e.g., leasing companies, etc.) that are not well regulated and outside the regulatory framework.
• Increased dialog with home supervisors of foreign banks.	May help limit foreign banks' exposures from creating systemic risks for local banks and domestic banking system as a whole.		Used/considered in Croatia, Greece	Particularly relevant when credit boom is dominated by foreign banks regulated and supervised by country authorities of parent banks; and where returns to aggressive lending may overshadow risks from a combined exposure of foreign banks to several regional banks.
IV. Financial Markets and Institutions Development Measures				
• Increasing the availability of hedging instruments to hedge exchange rate or interest rate risks, and asset management instruments to deal with distressed bank assets.	• Help raise resilience of balance sheets of banks and borrowers to changes in the exchange, interest rate and asset prices; deepen markets, and improve transmission mechanism; facilitate adopting flexible rates that help deal with credit growth.	• May take time to build, if at a very low starting point. • Requires private sector involvement.		When there are both macroeconomic and prudential concerns associated with rapid credit growth.
• Government borrowing strategies, in particular, shifting from external to domestic borrowing by the government.	• Reduce liquidity. • Stimulate domestic market development, hence providing alternative assets for banks to invest and diversify their risks.	• Resistance from government (Treasury/MoF) given if borrowing terms from abroad more favorable as opposed to borrowing domestically. • Effectiveness depends on whether there is appetite for government securities by the banks, particularly when the yield on these securities are not attractive when there are	Bulgaria (being considered)	• Helpful in the medium- to long-term as a measure to enhance the resilience and depth of the financial system and markets. • Could be effective as part of a

Measures	Impact	Limitations	Examples where they have been used	Appropriate situation to apply
		more attractive returns to lending (e.g., with large lending-deposit spreads, high return-high risk projects, etc.).		comprehensive package and with market-determined yields on the government securities.
• Developing securities markets (including domestic government securities markets).	• Help reduce dependence on bank credit and provide alternative assets for banks to invest and diversify risks.	May take time to build deep, liquid securities markets, hence may not be helpful in addressing the rapid credit expansion in the short run.	Considered in Bulgaria	Appropriate under any circumstances.
• Improving banks' and corporations' accounting standards.	Helps limit window-dressing activities that may be used to circumvent prudential and supervisory regulations.	Insufficient on its own to cope with excessive credit growth problem, unless used as part of a comprehensive set of measures.	Many countries as part of the transition process	Helpful where accounting and disclosure systems are opaque and there are large incentives to evade existing regulations.
• Improvement in credit culture, including via establishment of credit bureaus, credit registry.	Improves market discipline, and provides important information, data to supervisors, and limits deterioration in loan quality.	None	Bulgaria, Romania	Appropriate under any circumstances.
V. Administrative/Direct Measures				
• Controls on capital flows (e.g., on borrowing by banks and/or customers) to limit resources to extend credit, including: • reserve requirements on bank borrowing from abroad (including borrowing by foreign branch from parents). • differentiated reserve requirements on domestic and foreign currency deposits.	Limit the source of funding for banks that would be financing rapid credit growth for a limited time.	• Provide at most only temporary effect • Induce incentives to circumvent the controls, leading to disinter-mediation from the domestic banking system • Difficult to enforce unless the enforcement and implementation capacity of the authorities are very strong; particularly difficult to enforce when there are weaknesses in cross border regulation/supervision • Adverse impact on market confidence and credibility of the prevailing monetary regime (e.g., under a currency board that on rely significantly on full currency convertibility) • May lead to a move from foreign subsidiaries (which can be made subject to regulation/supervision) to foreign branches (supervision/regulation of which require parent cooperation)	Croatia (imposed marginal reserve requirement on foreign borrowing), Romania (increase in reserve requirement on FX liabilities and postponement of capital account liberalization)	Should be used only as a last resort if everything else fails and there are significant macroeconomic and prudential risks.
• Direct credit controls.	• Can deliver effective control over bank credit if reserve money creation is otherwise controlled, if the enforcement capacity is adequate, and in less well-developed financial markets	• Since not market-determined, progressively distort the allocation of bank resources and competition. • Can lead to disintermediation and ultimate loss of effectiveness (including by circumvention through borrowers' switching to less supervised nonbank financial institutions such as leasing/insurance companies or to direct borrowing from abroad, which increases private sector	In western Europe until late 1980s, some African and Asian countries during 1990s, and in transition economies; more recently in	• Could be an instrument during transition to indirect instruments; when transmission mechanism is uncertain; if the enforcement capacity is adequate with small risk of circumvention,

Measures	Impact	Limitations	Examples where they have been used	Appropriate situation to apply
	and closed capital account. • Can reduce loss of monetary control during transition to indirect instruments if transmission is uncertain.	external indebtedness). • Encourage balance sheet manipulation by banks. • Difficult to implement under free capital inflows. • Not consistent with a move toward market based monetary and financial sector policies; strong negative signal of lack of commitment to market mechanisms.	Greece (1999) when faced with capital inflows ahead of euro adoption and in Croatia (during 2003)	and in less well-developed financial markets with closed capital account. • Should be used only as a last resort if everything else fails and there are significant macro-economic and prudential risks; use relatively more market- based versions of such controls.
• Taxes on financial intermediation.	Makes financial intermediation costly, likely reducing lending activities.	• Distortionary for efficient allocation of resources. • May encourage window-dressing activities in banks' balance sheets to circumvent the taxes. • May lead to disintermediation if the tax level is prohibitive.	In several Latin American countries	
VI. Other (Measures to Promote Better Understanding of Risks)				
• Strengthening banks' ability to assess, monitor, and manage risks through workshops, training, etc.	Limits banks from taking excessive risks associated with liquidity, maturity, currency structure of their balance sheets and hence improve the quality of their asset portfolios.	None	Ukraine (ongoing efforts)	Appropriate under any circumstances.
• Consultative meetings with banks (including moral suasion) to persuade/warn banks to slow down credit.	Effective measure if the financial system is relatively small and easy to monitor and if authorities have alternative instruments to back up in case concerns persist.	• May be perceived intrusive if it takes the extreme forms. • Difficult to monitor in a well-developed sophisticated financial system. • No systematic mechanisms to ensure banks comply with the warnings.	Bulgaria, Estonia, Iceland	Where the financial system is small and closely integrated, banking system dominates the financial system, and there are good, working relations between banks and supervisory authorities.
• Public risk awareness campaigns, press statements, etc.	May help limit excessive risk taking by banks and customers and resulting deterioration in banks' assets.	None	Poland	Appropriate under any circumstances.

[1]The fundamental principle underlying dynamic provisioning is that provisions are set aside against loans outstanding in each accounting time period in line with an estimate of the long run, expected loss (Mann and Michael, 2002). Additional provisions are set aside in lending booms rather than in downturns when asset quality deteriorates, thereby making the level of provisioning less subject to sharp swings stemming from the strength of economic activity.

Sources: Alexander, Balino and Enoch (1995); Ariyoshi and others (2000), Gulde (1995), Cottarelli and others (1986), Cottarelli, Dell'Ariccia, and Vladkova-Hollar (2003), Watson (2004).

Explanation: FX = foreign exchange; RR = reserve requirements.

Measures Used to Deal with Credit Growth in Selected European Countries

Country	Measures with potential impact on credit growth	Impact to date
Bosnia	• Reform of reserve requirements in mid- and end-2003 (including foreign currency in the base, excluding vault cash from assets eligible to meet reserve requirements) to withdraw bank liquidity, and a reduction in the remuneration of excess reserves at the central bank (twice); • New tighter bank core capital requirements, tighter foreign exposure regulations (including off-balance sheet activities) and strengthened application of bank liquidity regulations.	• The credit boom that followed the surge in bank deposits since 2001 has eased somewhat (as of early 2004), in the wake of the mid-2003 monetary and regulatory tightening that has been stimulated by macroeconomic concerns. Banks seemed to comply with these measures and overall credit to private sector slowed down (from about 26% in 2002 to 21% in November 2003 as a whole, although credit to enterprises accelerated). The regulatory reforms also raised banks' demand for excess central bank deposits, stemming the growth of credit.
Bulgaria	• As a first phase in their strategy to deal with credit growth, the authorities also used suasion through public statements and meetings with banks, especially those with aggressive lending behavior. More recently, the NBB embarked on a series of meetings with CEOs of commercial banks to discuss the ongoing credit expansion and possible measures to dampen credit. • Since mid-2003, the BNB has been implementing a set of sequential measures to strengthen bank supervision, including tightening of loan classification and provisioning requirements; increasing the frequency and focus of onsite inspections, and restricting conditions under which current profits can be included in regulatory capital. • On the fiscal side, the authorities tightened their fiscal stance, in response to the widening of the current account deficit. • On the monetary side, given the limited options under a currency board, the authorities try to reduce banking system liquidity by tightening reserve requirements (by reducing the share of vault cash in eligible assets and broadening the liability base subject to RR by including deposits and securities with longer term maturity and repos); considered also to introduce a liquid asset requirement as a further measure to reduce bank liquidity to limit banks' capacity to lend. • To reduce information asymmetries and their adverse impact, the authorities also aim to strengthen information on retail lending conditions (e.g., overall indebtedness of particular households). • Consistent with its overall strategy to raise the share of domestic debt in total debt, as well as to limit credit growth by reducing bank liquidity while stimulating domestic market development, the government plans to shift from external borrowing to domestic borrowing (which is envisaged to be mostly absorbed by banks). • Introduced marginal reserve requirements for banks exceeding certain rate of credit growth (Feb 2005).	• Domestic credit growth has remained strong (as of late 2004). Financed by a sharp rise in deposits (in particular FX deposits) and in bank foreign liabilities, 12-month growth in claims to the non-government sector rose to 52½ % in July, after having fallen to 47.8% in June. Financing of the credit expansion relied more on the rapid increase in banks' foreign liabilities than drawing down their foreign assets which was the case before. The share of corporate credit continued to fall gradually, but still remained at about two-thirds of the total; corporate credit rose nearly 42%, while consumer credit by 76.3%, down from the January-July average of 80.7 percent. • The anticipated impact of the various credit and prudential measures has been reduced by rapid deposit growth (much of it from non-residents) and greater-than-expected bank foreign borrowing, with banks being able to obtain loans from abroad much easier than assumed (mostly from parent banks to their Bulgarian subsidiaries, given the continued high profits Bulgarian banks are generating, the investment grade rating recently given to Bulgarian sovereign debt, and rising confidence in timely EU accession).
Croatia	• Macroeconomic policies (some fiscal consolidation) to contain the domestic demand surge financed by bank credit (during 2000-mid-2003); some moderate tightening of interest rates, though using monetary policy was in general constrained by the commitment to a stable exchange rate policy and a very open capital account. • Direct credit controls—banks whose lending grew by more than 4% per quarter would be obliged to buy CNB bills at penalty rates in an amount twice as high as excess credit (Jan 2003, removed in end-2003). • Additional FX liquidity requirements—the required FX coverage of banks' FX liabilities was increased (24% of banks' foreign borrowing had to be held in foreign liquid assets) (Jan 2003). The coverage was further raised to 35% in Feb 2005, then lowered to 32% in Mar 2005. • Strengthening of prudential regulation and supervision (by-laws implementing a new Banking Law that came into force in January 2004 included charges for market risk into capital adequacy calculation and	• Macroeconomic policies did not manage to contain the surge in domestic demand, as fiscal consolidation was not sufficient to offset the growth in private consumption and investment; current account deficit rose sharply (above 8% of GDP). But credit boom unwound in 2002 and early 2003, likely reflecting debt carrying constraints as well as credit controls imposed by CNB, although lack of data precludes a full assessment of trends. • Direct credit controls were not successful in controlling aggregate demand or current account deficit: bank credit decelerated significantly since mid-2003), possibly affecting spending by households that do not have easy access to

Country	Measures with potential impact on credit growth	Impact to date
	increased provisioning for banks with rapidly growing portfolios. The CNB's banking supervision department was reorganized to operate more on risk basis, and its staffing was strengthened. • CNB introduced regulations requiring rapidly growing banks to meet even higher capital adequacy standards or be subject to mandatory retention of a portion of profits (early 2004). • Attempts to introduce counterparty exposure reporting systems, but with limited success due to weak reliability of data from the corporate sector. • Introduction of marginal reserve requirement on foreign borrowing (July 1, 2004) to reduce external vulnerability (from 11% of foreign borrowing to 35% of their new foreign borrowing). • The authorities saw introduction of (price-based) capital controls as last-resort policy option, in case of unexpected capital inflows that may threaten macroeconomic stability. • The authorities appointed a working group (Oct 2004) to unify supervision of nonbank institutions to cover supervision gaps (due to the rapid expansion of unregulated and unsupervised leasing companies and significant risk transfer from banks to insurance companies with limited risk management capacity and supervisory capacity in the insurance sector). The group is actively planning to implement the reform. • Recent agreement with the Fund on the need to closely monitor customers' FX risk during onsite inspections (including asking banks to inquire and report on the largest customers' FX exposure).	foreign borrowing, but corporates moved significantly out of borrowing from domestic to foreign banks (local banks typically directed most of their best corporate customers to their parent banks abroad) and used leasing and other forms of financing provided by unsupervised and unregulated leasing companies. Foreign debt rose strongly in 2003 with borrowing by banks and nonfinancial enterprises. • The limits hence also had a negative impact on the soundness of the financial sector. Anecdotal evidence suggests that insurance companies have taken on a substantial part of the credit risks associated with banks' retail portfolios, which is a concern given the limited risk management and supervisory capacity in the insurance sector. Also transparency of monetary and banking statistics deteriorated as banks engaged in some activities designed mainly to circumvent the limits, such as asset swaps, collateralization, and accelerated NPLs write-offs. • Private sector borrowing in FX remains a concern. Banks are vulnerable to indirect FX risk (credit risk due to currency mismatch between assets and liabilities of some clients) (about 78% of bank loans are denominated in or linked to FX and a significant share of those loans (about 60%) is extended to borrowers with kuna-denominated sources of income and often with limited access to hedging instruments).
Estonia	• The authorities recently reduced borrowing incentives by limiting mortgage interest deductibility to address the rise in households' real estate related borrowing, with plans for further reduction. • Moral suasion: the central bank and the financial supervisory authority repeatedly discussed and stressed with banks the need for continuing conservative lending practices. • Close monitoring of developments in credit.	• Domestic credit growth has remained robust to date (Oct 2004), financed increasingly by bank borrowing from abroad, mainly from foreign parent banks. Bank credit to household sector (mainly to acquire real estate) at 50% y/y in Q104 and credit to enterprises at 30% in H104. Around 65% of household loans and 78% of enterprise credits are in FX (95% in euros).
Greece	• In response to an acceleration of credit growth (in particular credit to households expanded by around 30%), stimulated by the favorable economic environment ahead of EU accession, Greece imposed credit controls in the form of non-remunerated deposits for an amount equivalent to the growth of credit above specified rates (mid-April 1999); at end-July 1999, in the face of still rapid consumer lending, penalty for excess lending in this category was doubled. Non-remunerated deposits were extended through the end of March 2000. Restrictions were lifted in April 2000. • Additional measures were taken to prevent a surge in liquidity when reserve requirements were reduced to the euro area's 2%, with freed-up reserves converted into blocked interest bearing deposits at the central bank, to be gradually released until end-2001. • Attention was then given more to greater monitoring of qualitative aspects of banks' activities, notably their credit management processes through stress testing and scenario analysis, to enhancing market discipline through greater public disclosure, improvement of coordination between supervisory agencies, and strengthening the independence of the supervisors.	• Credit growth has remained robust following the April 1999 measures, which necessitated further tightening several times until April 2000. In general the extent of slowdown in bank credit was limited by the increasingly accommodative monetary conditions in the run-up to the monetary union with a general decline in interest rates, easing of reserve requirements, lifting of credit restrictions in April 2000 and integration into the interbank euro market.
Iceland	• In response to a rapid rise of credit growth by deposit money banks during 1998-99, which was being increasingly financed by foreign	• As a result of the liquidity requirements, the commercial and savings banks' liquidity

Country	Measures with potential impact on credit growth	Impact to date
	borrowing by banks (with high proportion being short-term), the central bank took a few measures: • Moral suasion: it issued cautionary remarks to parties capable of influencing this development (management of banks and government authorities as the main owners of some of the players); • Tightening of interest rates: the central bank raised its key policy rate three times during 1999; • It set liquidity requirement ratios for credit institutions (February 1999) to counter the deteriorating liquidity position of credit institutions and their increasing use of short-term foreign capital.	positions improved significantly and the share of short-term foreign borrowing in liabilities were reduced. • The real growth of bank lending also slowed down somewhat (from 30% in 1998 to 15% until about early 2000), but it picked up again subsequently and remained at high levels during 2000. Whether the initial decline could be entirely attributed to the new liquidity rules was also uncertain, since the decline could also reflect the warnings and the impact of interest rate rises. • The liquidity rules, along with other factors, also led to some reduction in trading in bank and treasury bills.
Latvia	• Raised interest rates—refinancing rate (March 2004), and increased reserve requirements (July 2004) partially reversing an earlier decline to bring them in line with European Central Bank (ECB) requirements to stem private sector credit growth and inflation.	• So far the measures had limited effect, since banks' funding is mainly derived from abroad (Eurobond floatation and credit from parent banks) and domestic loans are extended mainly in foreign currencies. • Higher interest rates likely attracted additional capital inflows.
Moldova	• Responding to rapid bank credit growth over the past four years, the National Bank of Moldova (NBM) gradually implemented a system where required reserves for FX deposits are held in FX (since July 04). • The NBM required banks to have separate risk management units to identify and reduce specific risk exposures. The assessment of credit risk is generally made on a borrower-by-borrower basis, and the banks share information on problem borrowers on an informal basis, in the absence of a credit registry.	• Credit growth decelerated somewhat in 2004 but still remained strong.
Poland	• In response to increased foreign currency lending by banks from mid-2000, the supervisory authorities adopted a new capital adequacy regulation (in line with EU standards) that expanded the existing FX regulation to cover other risks (market, interest rate, commodity price and equity or debt instruments price risks), and required banks to increase capital to incorporate the aforementioned risks (this is in addition to the regulatory capital for credit risk). The previous limits on FX open positions were hence replaced with capital charges, implying higher capital for higher FX risks. • Periodic surveys of banks' FX exposure by supervisors to obtain specific information on banks' foreign currency lending, including borrowers' appetite for foreign currency loans, percentage of customers hedging their exchange rate risks, the form of hedging offered to customers, foreign currency loans protected by guarantees, costs for hedging loans as ratio to the loan, loan classification and provisions made, foreign exchange positions, by currency, receipts/costs of foreign exchange transactions, extent of engagement in arbitrage transactions. surveys followed up by action on procedures and banks stress tests. • Close monitoring of banks' exposure to FX risk and quality of FX risk management, internal controls. The authorities developed a credit information database and formed a unit to monitor vulnerabilities from credit risk associated with FX denominated lending. • Some form of moral suasion: From 2001, supervisors' warning of banks and written guidance from head of supervision, and press coverage of risks to households.	• The rapid increase in FX-denominated credit since mid-2000 reversed in late 2002 (at an average of around 26% of total loans during 2000-2003). The depreciation of the zloty against the euro and the narrowing of the spreads between zloty and foreign interest rates were also believed to have reduced foreign currency borrowing. The rapid growth of FX-denominated housing loans slowed significantly in the last quarter of 2003 as zloty interest rates declined and households became more careful about unhedged borrowing. Nonetheless, about half of the outstanding stock of housing loans was still FX denominated or -indexed.

Country	Measures with potential impact on credit growth	Impact to date
Portugal	• The authorities strengthened regulatory measures further by tightening rules governing general provisions, large exposures, connected lending, and capital adequacy. • However, in response to the rise in private sector bank borrowing, which led to a surge in domestic demand and a widening of the current account deficit financed by reduced holdings of government paper and increased borrowing from abroad, the authorities took further measures: (i) the authorities tightened further prudential and supervisory measures to safeguard continued soundness of the financial sector, tightening of capital requirements for housing loans with loans-to-value ratios exceeding 75% as well as tightening provisioning requirements for consumer loans in early 1999—with household credit growth rising strongly from mid-1996 and helping finance the ongoing boom in housing and durables consumption through imports; (ii) new reporting requirements for liquidity monitoring purposes were put in place, as well as guidance for controlling the reliance on short-term market borrowing; (iii) the authorities increased reporting and disclosure requirements for banks on their risk management and control policies and practices to enhance market discipline, undertook impact studies within the scope of amending capital and provisioning requirements, and strengthened coordination between different supervisory agencies of the financial sector, forming in 2000 the National Council of Supervisors comprising all financial sector supervisors. Promoting the coordination of the action, facilitating and coordinating the exchange of information, and formulating proposals for the regulation of matters undertaken by the financial system's supervisory authorities are among the responsibilities of the Council. Since its establishment, the Council has had regular meetings. Supervision of financial conglomerates, anti-money laundering rules, and structured deposits were some of the main issues discussed.	• During the second half of the 1990s, the marked fall in interest rates contributed to the strong growth in loans granted to the non-financial private sector. These developments resulted in large borrowing requirements, which translated into a large current and capital account deficit. • In 1999, following the ECB interest rate rise, a significant decline in credit growth was observed. The economic slowdown that culminated in the 2003 recession implied a further reduction in the pace of growth of credit to non-financial corporations and consumer credits. However, housing loans' growth slowly declined but persisted growing at a nominal rate in excess of or around 10 percent. • Initially, banks financed the rapid credit growth by disposing government debt holdings and resorting to money market borrowing. Later in the process, an increase in the maturity of bank debt stock has been observed, in particular by substituting interbank liabilities by longer-term debt securities issues. In addition, the possibilities opened by securitizations also expanded the banks' liquidity management options.
Romania	• Fiscal and monetary tightening. • Strengthened bank supervision with stricter loan classification rules and introduction of prudential norms to tighten eligibility for consumer and mortgage loans (in particular, limiting the monthly-payment-to-net income ratio to 30%, imposition of mandatory 25% down-payment or cosigner/ insurance for consumer loans, and a cosigner, insurance, or collateral for personal loans, and reducing the monthly-payment-to-net-income ratio to 35% and introducing a maximum loan-to-value ratio of 75% for mortgage loans). • Introduction of a regulation that limits insurance companies' exposure to bank loans. • Establishment of a credit bureau to monitor consumer loans and business credit (expected to be operational in the last quarter of 2004). The authorities recently expressed commitment to measures for expanding the database of the NBR's credit bureau. • Postponement of the liberalization of permitting leu deposits by nonresidents in the local banks. • Increase in the mandatory reserve requirement on banks' foreign currency denominated liabilities from 25% to 30% (from August 2004). Extension of the 30% reserve requirement to such liabilities with maturity over 2 years (since February 2005). • Cutting of policy interest rates to limit capital inflows (2004-March 2005).	• Private sector credit growth has slowed from August 2003 to April 2004, but picked up again afterwards. Growth in lei credit nearly came to a halt, reflecting high interest rates and the effects of the regulatory measures approved in late 2003. But, the FX-denominated credit has started to pick up again, driven by strong mortgage demand and a switch for some consumer durables from lei to foreign currency credit, though the end-August increase in RR on FX-denominated loans seems to have helped slow down its growth. About 75% of the growth is in FX credit, out of which 30% is to households, and 70% of this comprises mortgage loans. • The authorities remain alert to persistent strength of credit growth in FX-denominated credit; additional measures being contemplated (e.g. the introduction of a marginal reserve requirement on FX liabilities, higher provisioning requirements against FX loans, introduction of currency specific liquidity requirements at binding levels) to slow credit growth. • Cutting of policy interest rates through 2004 to Mar 2005 has not have a major effect on lei-denominated credit, owing to the large interest rate differential between lei- and FX-denominated loans and the expectations for exchange rate appreciation.

Country	Measures with potential impact on credit growth	Impact to date
Serbia	• Tightening of monetary policy by raising the required reserve ratio on all dinar and enterprise FX deposits by 3 percentage points to 21% and stepping up open market operations (August 2004) as a result of a strong growth in bank credit to non-government sector (25.8% real growth year on year in July 2004). • The authorities issued a guideline tightening conditions for bank consumer loans and requested the banks to adopt the guideline in December 2004. They have also increased the capital adequacy ratio to 10 percent (effective March 2005) and broadened the reservable base to include commercial banks' foreign borrowing (effective January 2005). Specifically, the reservable base now includes the stock of all foreign borrowing with a maturity of up to 4 years and all new foreign borrowing independent if the maturity. In addition, they are currently preparing a regulation on monitoring and managing credit risk resulting from borrowers' exposure to exchange rate risk. Moreover, they are exploring possibilities to start regulating and supervising leasing companies.	• The monetary tightening in mid-2004 did not have any tangible impact on credit growth, which accelerated further in the second half of the year, reaching 32.9 percent in real terms in November. This largely reflects the limited effectiveness of monetary policy under the conditions of high euroization, with 67 percent of total credit to non-government being extended in foreign currencies or indexed to foreign currencies, and limited instruments for indirect monetary control. • Given the fairly recent implementation of the prudential measures, effectiveness can only be assessed on a preliminary basis. Consumer lending slowed down significantly in the three months after the tightening measures. Credit to nongovernment also slowed down, but in a less pronounced manner. Banks remain vulnerable to indirect FX risk.
Spain	• Dynamic provisioning: Concerned that banks' loan portfolios continued to expand and that loan provisions were not keeping pace with potential credit losses latent in new lending, the Bank of Spain introduced a new "statistical provisioning" method, effective July 2000. The provision is dynamic as it is envisaged to increase when specific provisions (i.e., actual losses) for a year are lower than expected credit losses, and used to set against specific provisions in years when specific provisions are higher than expected credit losses. The statistical provisions are subject to an upper limit and are not tax deductible. • With continued growth of housing credit, the authorities closely monitored forward looking indicators of potential debt-servicing difficulties, placing emphasis on continued vigilance, accompanied with moral suasion, to ensure that credit institutions exercised adequate caution, with effective credit approval and monitoring processes in place.	• The statistical provisions grew significantly over 2000 to 2002. While growth of housing credit slowed down temporarily from 2000 to 2002, it resumed its pace of growth, from 14% in 2002 to about 21% in 2004. The share in total credit to the private sector from credit institutions rose from 28% in 1997 to around 34% in 2004. • Dynamic provisioning was eliminated in December 2004.
Ukraine	• In response to a very rapid growth of banking system credit to the private sector (from about 33% y/y in early 2002 to a peak of 64% in Nov 2003) and with a view to reducing the credit risk in the economy and strengthening the banking sector a number of prudential and supervisory measures were taken: the minimum capital adequacy ratio was raised from 8 percent to 10 percent (March 2004); resolutions were issued in early April to increase and improve the quality of bank capital; loan classification rules were somewhat strengthened; related-party lending regulations were tightened by requiring lending to related-parties at favorable terms to be fully matched by set-aside capital; methodological guidelines were introduced on the inspection of banks based on a "Risk Assessment System" in March 2004. While they may not be specifically aimed at addressing rapid credit growth, a number of measures taken may contribute to strengthening creditor rights and integrity of the financial system (a law on mortgages was passed, new civil and commercial codes were adopted, amendments were made to anti-money laundering (AML) legislation, and a regulator for nonbank financial institutions established). • Limited monetary measures during 2004: an increase in the overnight refinancing rates, a change in reserve requirements to reduce the eligible amount of vault cash in reserve requirements, elimination of the long-term refinancing facility that could potentially distort the credit market, and a change in the requirements for banks' access to NBU resources.	• The rate of growth of bank credit slowed down significantly from early 2004, to about 45% as of Oct 2004, though still at a relatively high rate.

Sources: IMF Country Reports (Staff Reports and Selected Issues), Annual Reports of Central Banks, Kraft and Jankov (2005), and Fernandez de Lis, Pages, and Saurina (2000).
Explanation: FX = foreign exchange; RR = reserve requirements.