



OESTERREICHISCHE NATIONALBANK

Stability and Security.

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E U R O P E A N   E C O N O M I C  
I N T E G R A T I O N

This Issue's Special Focus:  
**The Monetary Transmission Mechanism**



1 / 06

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The views expressed are those of the authors and need not necessarily coincide with the views of the Oesterreichische Nationalbank.



## Editorial

Dear reader,

Anniversaries are a highly welcome topic to start luncheon speeches or, indeed, editorials. It is therefore a great pleasure for me to inform you that the Focus on Transition was created ten years ago to provide a platform for the numerous analyses and studies by OeNB experts on Central and Eastern Europe. What was initially a small periodical for a limited group of experts has meanwhile become a widely known publication, not only because of the topicality and high quality of the analyses, but also because this product has undergone a constant, critical process of change and review. The last major change occurred in 2004, when among other things the publication was renamed Focus on European Economic Integration and a new group of countries (mainly Southeastern European countries) was included in the data set.

This time you will find that we have revised the format of the chapter Developments in Selected Countries. The idea was to highlight two or three main issues per country and to streamline the tables. The chapter starts with a cross-country overview and pinpoints general trends that characterize all countries covered. In addition, the publication now includes data on Turkey, thus reflecting this country's status as an EU accession country as of autumn 2005. Last but not least, the chapter Developments in Selected Countries will be published on our website [ceec.oenb.at](http://ceec.oenb.at) prior to the publication of the Focus. This provides our readers with a head start in accessing timely data and information.

This edition focuses on the monetary transmission mechanism (MTM). In contrast to the situation a few years ago, the Central and Eastern European countries (CEECs) are no longer uncharted territory. The literature survey compiled by Fabrizio Coricelli, Balázs Égert and Ronald MacDonald impressively confirms this. These authors' paper addresses the functioning of the separate channels in the monetary transmission mechanism, explores possible interrelations between different channels and compares the empirical findings for the CEECs with the results for euro area countries.

Another team of authors, Jesús Crespo-Cuaresma, Balázs Égert and Thomas Reininger, reflects on the interest rate pass-through in five CEECs and compares it with the pass-through in selected euro area countries. Although the pass-through is usually higher in these CEECs than in Austria and Germany, it has been declining over time in particular in Hungary and (with respect to lending rates) in Poland. To my mind, this reflects the progress achieved in deepening the financial markets, which are also well integrated by now.

The chapter Developments in Selected Countries clearly shows that high credit growth is an issue in several CEE countries. A study by Peter Backé, Balázs Égert and Tina Zumer uses panel data analysis to judge whether credit-to-GDP levels have reached equilibrium. This issue is closely related to the question whether credit growth can be considered sustainable. The results vary across countries, suggesting that some CEECs' economies may have already come close to equilibrium by 2004, whereas others seem to be well below the level justified by the fundamentals.

Finally, we are proud to present the prize-winning study by one of last year's Olga Radzyner Award winners, Zsolt Darvas, who has also worked on the MTM. He shows that the transmission mechanism is not invariant to differences and changes in monetary policy regimes. In fact, monetary policy is most powerful (even comparable with that in the euro area) in Poland, and is least powerful in Hungary, whereas the Czech Republic lies somewhere in between.

By the way, to readers who are interested in MTM issues in general, and in the MTM studies published in this issue of the Focus in particular, I am pleased to announce that the OeNB will be hosting an East Jour Fixe seminar addressing the MTM in CEECs on September 15, 2006.

An economic overview of Ukraine, written by Stephan Barisitz and Annemarie Pemmer, forms another important contribution to our extensive collection of CEE country studies. Given the background of internal events (elections in March 2006) and external developments (the country's major role as a transit country in the European energy market), this study is highly topical. Incidentally, a complementary analysis of financial market developments in Ukraine (which may be especially informative for readers who are knowledgeable about the significant investments of Austrian banks in Ukraine), will be published in one of the OeNB's next Financial Stability Reports.

The summary of our last Conference on European Economic Integration (CEEI), which was compiled by Zoltan Walko, may be attractive to two separate groups of readers: Those who were not able to attend the conference in November 2005, and those who were there, but do not wish to wait for the publication of the conference volume in November 2006 by Edward Elgar.

This seems to be the right moment to announce the forthcoming CEEI, which will take place on November 20 to 21, 2006, in Vienna and which will be entitled "The Changing Landscape of FDI in Europe." This year's conference will be coorganized by the European Bank for Reconstruction and Development (EBRD). Thus, we have been able to take a well-known international institution on board that is most competent in this particular field. If you are interested in participating in the conference, please let us know via [ceec.oenb.at](mailto:ceec.oenb.at).

If you have further comments or are looking to exchange ideas, please do not hesitate to contact us at

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You may also fax your comments to (43-1) 404 20-5299 or mail them to [doris.ritzberger-gruenwald@oenb.at](mailto:doris.ritzberger-gruenwald@oenb.at), Head of the Foreign Research Division.

Klaus Liebscher  
Governor

# RECENT ECONOMIC DEVELOPMENTS

# Developments in Selected Countries<sup>1</sup>

## 1 Introduction

In the five Central European new EU Member States – the Czech Republic, Hungary, Poland, Slovakia and Slovenia – GDP growth in 2005 was solid, even though it did not fully match the record 2004 figures. Moreover, growth started to accelerate in the last three quarters of 2005 after dipping in the first quarter of 2005. With a growth rate of above 4%, the five countries were again one of the growth engines of the European Union, and they were clearly more dynamic than many countries of the euro area, which recorded an aggregate growth rate of 1.3%. Growth in the acceding countries, Bulgaria and Romania, and in the two accession countries, Croatia and Turkey, as well as in Russia displayed a similar pattern as in the Central European countries: It was mostly below 2004 figures but still robust.

Considerable differences  
in the composition of  
growth across countries

In most of Central Europe, growth in 2005 was to a considerable extent driven by net exports. However, as imports may have been underrecorded due to changes in the compilation of statistics after the inclusion of these countries in the EU Single Market, the contribution of net exports may have been overstated. But even accounting for this element of uncertainty, net exports have been a key driver of growth. Private consumption, in turn, grew more slowly than overall GDP. Slovakia is a bit of an outlier, as growth was based strongly on domestic demand, including animated gross fixed capital formation, while the contribution of net exports was almost neutral. In contrast to the export-led growth in most of Central Europe, the main motor of growth in Romania and Bulgaria was private consumption, in Bulgaria joined by gross fixed capital formation, while the contribution of net exports to growth was strongly negative. Croatia, in turn, is an intermediate case, with growth mostly being supported by domestic demand, while the contribution of net exports was broadly negligible. The composition of growth in Turkey and Russia shows strong private consumption and gross fixed capital formation, while net exports display a moderately negative contribution.

Table 1

Gross Domestic Product (Real)									
Annual change in %	2002	2003	2004	2005	Q1 2005	Q2 2005	Q3 2005	Q4 2005	
Czech Republic	1.5	3.2	4.7	6.0	5.3	5.8	5.8	6.9	
Hungary	3.8	3.4	4.6	4.1	3.2	4.5	4.5	4.3	
Poland	1.4	3.9	5.3	3.2	2.1	2.8	3.7	4.2	
Slovakia	4.6	4.5	5.5	6.0	5.1	5.1	6.2	7.6	
Slovenia	3.5	2.7	4.2	3.9	2.8	5.4	3.6	3.7	
Bulgaria	4.9	4.5	5.7	5.5	5.9	6.5	4.6	5.5	
Romania	5.2	5.2	8.4	4.1	6.0	4.5	2.4	4.3	
Croatia	5.6	5.3	3.8	4.3	1.8	5.1	5.2	4.8	
Turkey	7.9	5.8	8.9	7.4	6.6	5.5	7.7	9.5	
Russia	4.8	7.4	7.2	6.4	5.0	5.7	6.6	7.9	

Source: Eurostat, national statistical offices, wiw.

<sup>1</sup> Compiled by Antje Hildebrandt in cooperation with Stephan Barisitz, Balázs Égert, Johann Elsinger, Silvia Kirova, Thomas Reiningner, Josef Schreiner, Tomas Slacik, and Zoltan Walko. The analysis is based on information and data from a variety of sources.

2005 was marked by lower annual average inflation rates than in 2004. However, some of the new Member States, especially the Czech Republic and Slovakia, saw inflation pick up in the last quarter of 2005 and/or in the first quarter of 2006. The monetary authorities reacted with interest rate hikes to combat the buildup of inflationary pressure. In the acceding countries, the disinflation process continued but inflation remained high, especially in Romania. Bulgaria's inflation rate in fact accelerated in recent months, driven by tax hikes, higher regulated prices and oil prices, furthermore, partly by strong domestic demand. Motivated by above-target inflation, the Banca Națională a României (BNR) increased its key interest rate by 100 basis points in February, thus reverting its earlier interest reduction policy that had brought down key interest rates from more than 20% at the beginning of 2004 to 7.5% in late 2005. Croatia saw a rise in inflation in 2005 and at the beginning of 2006; however, price increases remained low. Turkey, by contrast, managed to bring inflation to a single-digit rate in 2005, but some price pressure built up in the first quarter of 2006. No major change was observed in Russia, where prices continued to grow at double digit rates.

**Disinflation process continued in 2005 but inflationary pressure picked up somewhat in recent months**

Table 2

### Consumer Price Index (here: HICP)

Annual change in %

	2003	2004	2005	Q1 2005	Q2 2005	Q3 2005	Q4 2005	Q1 2006
Czech Republic	-0.1	2.6	1.6	1.4	1.2	1.6	2.2	2.4
Hungary	4.7	6.8	3.5	3.5	3.6	3.5	3.2	2.4
Poland	0.7	3.6	2.2	3.6	2.2	1.8	1.2	0.9
Slovakia	8.4	7.5	2.8	2.8	2.6	2.2	3.7	4.2
Slovenia	5.7	3.7	2.5	2.8	2.2	2.3	2.6	2.3
Bulgaria	2.3	6.1	5.0	3.8	4.9	4.8	6.6	8.0
Romania	15.3	11.9	9.1	8.9	9.9	9.0	8.5	8.7
Croatia <sup>1</sup>	1.8	2.1	3.4	3.1	3.1	3.5	4.0	3.5
Turkey	25.6	10.1	8.1	8.8	8.7	7.8	7.3	7.6
Russia <sup>1</sup>	13.6	11.0	12.5	12.9	13.4	12.5	11.2	10.8

Source: Eurostat, national statistical offices, wiw.

<sup>1</sup> CPI.

Some of the new Member States aspire to introduce the euro faster than others. Slovenia can certainly be considered one of the frontrunners: In mid-2004, the country entered ERM II and in March 2006 formally applied for a convergence examination before the summer so as to adopt the euro at the beginning of 2007. Lithuania also asked for such an examination. While Slovenia seems to be in a good position to meet the convergence criteria, inflation in Lithuania is, at present, just above the reference value and may lie more tangibly above this value over the near future. In November 2005, Slovakia was the second Central European country to enter ERM II. The three other new Member States from Central Europe – the Czech Republic, Hungary and Poland – have not yet announced that they would launch ERM II entry in the near future.

**Slovenia as a frontrunner for euro adoption**

An important precondition for future euro adoption is fiscal prudence. In particular, euro candidates must not have an excessive budget deficit, i.e. no EU Excessive Deficit Procedure (EDP) must have been launched against them.

Among the Central European countries, the Czech Republic, Hungary, Poland and Slovakia are currently subject to an EDP. The Czech Republic aims at bringing the deficit to below 3% of GDP in 2008, Slovakia in 2007. Both targets are in accordance with the recommendations of the EU Council. Poland, however, does not currently envisage, as urged by the EU Council, a correction of its excessive deficit by 2007, while Hungary's program to correct the deficit by 2008 has not been found sufficiently credible by the EU Council and must be substantiated by September 1, 2006.

At the same time, it is noteworthy that actual fiscal outcomes in 2005 were better in most countries than planned. In fact, in 2005 none of the five Central European countries but Hungary recorded a deficit above 3% of GDP (excluding the cost of pension reforms). It remains to be seen whether this overperformance will be a lasting one and thus possibly allow a faster lifting of the EDP for some countries than originally planned.

**Bulgaria and Romania en route to EU membership**

For the two acceding countries, the main focus is currently on meeting the conditions for EU membership. In its monitoring reports of end-October 2005, the European Commission commended the two countries for reform progress made in many different areas but also listed a number of shortcomings that remain. In mid-May 2006, the European Commission is expected to submit monitoring updates on the basis of which the entry date 2007 – or its postponement to 2008 – will be fixed.

**Negotiations for EU accession with Croatia and Turkey**

At the beginning of October 2005 the European Council furthermore decided to open negotiations for EU accession with Croatia and Turkey. The green light for negotiations with Croatia was given when the country was found to be cooperating satisfactorily with the International Criminal Court. The negotiations with Turkey are an open-ended process: the objective, accession to the EU, is clear but it cannot be taken for granted *ex ante* that this will be the final outcome of negotiations.

**External imbalances problematic predominantly in the acceding and accession countries**

Most new Member States' current account deficits decreased in 2005 compared to a year earlier. The higher deficit in Slovakia is expected to be only temporary and related to the present erection of two automobile plants, as investment goods are being imported while exports will start in 2006 to 2007. In Hungary, the current account deficit still remained high but decreased slightly compared 2004, whereas in the acceding and accession countries the already high deficit widened further in 2005, with the largest increase taking place in Bulgaria. In Bulgaria and Romania the significant current account deficits are mainly driven by the deterioration of the trade balance, as growth rates of imports outstripped the growth of exports. High import growth was partly the result of strong increases of credits to the private sector. In these countries, the monetary authorities have already taken several measures to curb credit growth. So far, however, the measures have been only partly effective. Especially in Hungary, Croatia and Turkey, the current account deficit was only covered to some extent by foreign direct investment (FDI) inflows, which led to a rise in the countries' net foreign debt in percent of GDP.

**Global financial market jitters barely affected most Central, Eastern and Southeastern European countries**

Increasing long-term interest rates in the U.S.A. and the euro area, combined with expectations of further interest rate rises in both of these regions and in Japan, led to a decrease in global risk appetite and to asset price losses during March 2006 not only in several emerging markets but also in Iceland

and New Zealand (where the losses were exacerbated by country-specific factors). However, these developments barely impinged on Central and Eastern Europe. Only the currencies of Hungary and Poland were noticeably affected, as these external developments were aggravated by internal factors in both countries (the still high external financing requirement combined with an inappropriate fiscal policy in Hungary, political noise in Poland). However, the currency weakening in these two countries was fairly well contained and not accompanied by a general flight of foreign capital: Initial losses in equity prices and modest increases in local currency government bond spreads against the euro area during the first half of March were reversed in the following weeks.

Slovenia continues to have the best rating in the group of countries under review in this report, followed by the Czech Republic and Hungary. In the review period, Slovakia, Bulgaria, Turkey and Russia received rating upgrades (see table 3).

**Rating upgrades for Slovakia, Bulgaria, Turkey and Russia**

Table 3

### Ratings of Sovereign Long-Term Foreign Currency-Denominated Debt

Currency	Moody's Current rating*	Last change (former rating)	Standard & Poor's Current rating**	Last change (former rating)
Czech koruna	A1	Nov. 2002 (Baa1)	A-	Nov. 1998 (A)
Hungarian forint	A1	Nov. 2002 (A3)	A-	Dec. 2000 (BBB+)
Polish zloty	A2	Nov. 2002 (Baa1)	BBB+	May 2000 (BBB)
Slovak koruna	A2	Jan. 2005 (A3)	A	Dec. 2005 (A-)
Slovenian tolar	Aa3	Nov. 2002 (A2)	AA-	May 2004 (A+)
Bulgarian lev	Baa3	Mar. 2006 (Ba1)	BBB	Oct. 2005 (BBB-)
Romanian leu	Ba1	Mar. 2005 (Ba3)	BBB-	Sep. 2005 (BB+)
Croatian kuna	Baa3	Jan. 1997	BBB	Dec. 2004 (BBB-)
Turkish lira	Ba3	Dec. 2005 (B1)	BB-	Aug. 2004 (B+)
Russian ruble	Baa2	Oct. 2005 (Baa3)	BBB	Dec. 2005 (BBB-)

Source: Bloomberg.

\*: Aaa (best), Aa, A, Baa, Ba, B, Caa, Ca, and C (worst); each of the categories is further divided into 1, 2, and 3.

\*\* : AAA (best), AA, A, BBB, BB, B, CCC, CC, C and D (worst); each of the categories is further divided into + and -.

## 2 Czech Republic: Strong Economic Performance but Need for Further Reforms

Growth driven predominantly by net exports

The Czech Republic's economic performance in 2005 was one of the strongest and soundest on record. GDP growth improved substantially compared to 2004 and at 6% reached the highest annual rate since 1993. Unlike in previous years, growth was backed mainly by net exports as opposed to domestic demand. Compared with 2004, the pace of growth of both exports and imports decelerated as the positive one-off effect of EU entry faded. Notwithstanding, net exports lay at the heart of the economy's expansion. The strong increase in net exports was spawned by relatively subdued domestic demand, reflected in a much slower rise of imports. The reason for the moderate domestic demand dynamics was primarily the substantial slowdown in the growth of households' real disposable income. The latter expressed itself also in the rather moderate rise of private consumption amounting to less than half of total GDP growth. Households, whose consumption makes up more than two-thirds of total domestic spending, increased especially their transport- and household equipment-related expenditures. Also, the growth pace of fixed capital formation slackened somewhat from 2004, particularly because expenditures on residential housing contracted.

Rather limited improvement on the labor market

One of the effects that essentially contributed to the economy's strong performance was certainly the rise of overall labor productivity. Still, in the industry sector labor productivity growth almost halved compared with 2004. As a result, despite relatively moderate wage increases, unit labor costs (in industry) fell only marginally. Notably, strong growth failed to appreciably improve the mixed situation on the labor market. Although the unemployment rate, which was relatively low by EU standards, declined slightly and hovered around 8%, particularly the percentage of long-term unemployed (about half) remained persistently high. However, the employment structure witnessed some pronounced changes, as a number of entrepreneurs closed down their businesses and became employees.

Balance of payment accounts top expectations as trade balance moves into surplus

In the wake of high export growth, the balance of foreign trade with goods and services recorded a surplus for the first time in a decade. Trade with vehicles and machines contributed predominantly to this result.<sup>2</sup> On the other hand, sizeable price hikes of oil and related commodities extensively augmented the import bill and thus caused the overall trade balance to deteriorate. The deficit of the income account, which is largely determined by the profits of foreign-owned companies, dropped from last year's record level. The latter combined with the foreign trade surplus enabled the current account deficit to recover substantially; it decreased by more than four percentage points to low levels. Since the capital account balance was faintly positive, the Czech Republic's external financing requirement in 2005 was only about 1.9% of GDP. Mainly because of the sale of the government's stake in Český Telekom to Spanish Telefonica, net FDI inflows more than doubled compared to 2004 and came very close to those of the record year 2002. In addition to covering the external financing requirement, these inflows were for the most part spent

<sup>2</sup> Chiefly due to production increases of Skoda Auto and the shift of the new joint car production plant TPCA in Kolin to full capacity use.

on foreign debt securities (portfolio investment outflows) as well as a substantial accumulation of foreign reserves by Česká národní banka (ČNB).

Despite robust growth, high energy prices, and notable rises in administered prices and indirect taxes, the Czech economy did not show any signs of extensive inflationary pressure. In 2005, both the consumer price (HICP) and the producer price (PPI) inflation rate almost halved compared to 2004. Inflation gradually increased in the course of 2005, moving into the central bank's inflation target range (2% to 4% as of the turn 2005–2006).<sup>3</sup> Above all, decreasing prices of clothing, footwear and food along with a nominal effective appreciation of the koruna helped curb inflation. Encouraged by the continuous disinflation, the ČNB cut its key interest rate three times in early 2005. At the end of October, the ČNB council raised the leading interest rate by 25 basis points to 2.0%, where it has remained ever since, in the meantime standing 50 basis points below the ECB's key interest rate. In 2005 and into early 2006, the Czech koruna followed its earlier appreciation trend. Between January 2005 and March 2006, it gained some 12% against the euro and currently ranges at around 28.5 CZK/EUR. The underlying reason for this development appears to be chiefly the positive macroeconomic development and the continued high return on investment in the industrial and service sectors that foreign investors expect.

**Inflation well under control, supported also by appreciating koruna**

Following a deficit reduction to 2.9% of GDP in 2004, the general government deficit improved further last year to 2.6% of GDP (much below the 4.8% expected according to the updated convergence program of December 2005). As in 2004, this encouragingly positive outcome was brought about primarily by revenue surprises rather than lower-than-planned expenditures. Windfall revenues were the consequence of more vigorous economic growth on the one hand and rollovers of unspent funds from the previous year on the other. Yet the Czech Republic has not undergone sufficiently far-reaching reforms above all with aging-related expenditures. For 2006, the Czech Republic is targeting a deficit of 3.8% of GDP. In mid-2004, the EU Council decided that the Czech Republic was in excessive deficit. At the beginning of 2006, the EU Council noted that the country was on track to reduce the deficit by 2008 as pointed out in the updated convergence program. However, in the light of the euro adoption envisaged for 2010 and additional cofinancing needs for EU-funded projects, both the OECD and the Ecofin highly recommend accelerating a major overhaul of the pension and health-care systems to keep deficit and debt under control in the long run. Moreover, to sustain the pace of growth, future governments will have to face up to other challenges, such as the high level of long-term unemployment, increasing demand for degree-level education as well as the establishment of further scope for improvement of the business environment.<sup>4</sup>

**Fiscal balance encouraging, but prospects challenging**

<sup>3</sup> The ČNB uses the CPI rather than the HICP as an inflation indicator.

<sup>4</sup> See *Ecofin Assessment of the updated Convergence Programme of the Czech Republic, November 2005, and OECD 2006 Economic Review – Czech Republic*.

Table 4

Main Economic Indicators: Czech Republic								
	2002	2003	2004	2005	Q1 2005	Q2 2005	Q3 2005	Q4 2005
Year-on-year change of the period total in %								
GDP in constant prices	1.5	3.2	4.7	6.0	5.3	5.8	5.8	6.9
Private consumption	2.8	4.6	3.3	2.6	2.1	2.8	2.9	2.6
Public consumption	4.5	3.8	-2.7	0.8	-1.4	0.8	4.6	-0.6
Gross fixed capital formation	3.4	4.7	5.3	3.7	3.0	3.3	4.3	4.2
Exports of goods and services	2.1	7.5	21.4	11.1	17.5	6.5	11.3	10.4
Imports of goods and services	4.9	7.9	18.4	4.8	10.4	-0.4	6.1	4.4
Contribution to GDP growth in percentage points								
Domestic demand	4.2	4.5	4.7	0.5	0.1	-1.1	1.7	1.3
Net exports	-2.7	-1.3	0.0	5.4	5.3	6.9	4.1	5.6
Year-on-year change of the period average in %								
Labor productivity of industry (real)	6.8	7.9	9.7	5.4	3.9	4.0	7.6	6.1
Gross average wage of industry (nominal)	6.7	5.9	7.0	4.5	3.8	4.9	4.9	4.4
Unit labor cost of industry (nominal)	-0.1	-1.9	-2.5	-0.8	-0.1	0.8	-2.5	-1.5
Producer price index (PPI) of industry	-0.5	-0.4	5.7	3.0	6.8	4.1	1.4	0.0
Consumer price index (here: HICP)	1.4	-0.1	2.6	1.6	1.4	1.2	1.6	2.2
EUR per 1 CZK, + = CZK appreciation	10.6	-3.2	-0.2	7.1	9.5	6.3	6.4	6.2
Period average levels								
Unemployment rate (ILO definition, %, 15-64 years)	7.4	7.9	8.4	8.0	8.4	7.8	7.8	7.8
Employment rate (15-64 years)	65.4	64.7	64.1	64.8	64.1	64.7	65.2	65.2
Key interest rate per annum (%)	3.6	2.3	2.2	2.0	2.3	1.8	1.8	2.0
CZK per 1 EUR	30.8	31.8	31.9	29.8	30.0	30.1	29.7	29.3
Nominal year-on-year change of the period average stock in %								
Broad money (including foreign currency deposits)	-7.6	5.2	10.3	6.4	5.4	5.8	6.2	8.1
Contributions to the year-on-year change of broad money in percentage points								
Net foreign assets of the banking system	8.5	1.2	2.9	5.2	-0.1	3.3	7.9	9.5
Domestic credit of the banking system	-1.1	7.7	7.1	0.7	2.2	0.7	-1.0	0.9
of which:								
claims on the private sector	-9.6	0.9	6.0	8.6	7.1	7.8	9.3	10.0
claims on households	1.9	3.3	4.4	5.4	4.9	5.2	5.6	6.0
claims on enterprises	-11.4	-2.5	1.5	3.2	2.1	2.6	3.8	4.1
claims on the public sector (net)	8.4	6.8	1.2	-7.9	-4.8	-7.1	-10.4	-9.1
Other domestic assets (net) of the banking system	-15.0	-3.7	0.3	0.5	3.3	1.8	-0.6	-2.4
% of GDP, ESA 95								
General government revenues	39.9	40.7	41.4	41.1				
General government expenditures	46.7	47.2	44.2	43.7				
General government balance	-6.8	-6.6	-2.9	-2.6				
Primary balance	-5.6	-5.5	-1.7	-1.4				
Gross public debt	28.8	30.0	30.6	30.5				
EUR million, period total								
Merchandise exports	40,713	43,053	54,071	63,003	14,590	15,841	15,490	17,082
Merchandise imports	43,034	45,235	54,910	61,662	13,719	15,359	15,516	17,069
% of GDP, period total								
Trade balance	-3.0	-2.7	-1.0	1.4	3.8	1.9	-0.1	0.1
Services balance	0.9	0.5	0.5	0.7	0.5	1.0	0.9	0.3
Income balance (factor services balance)	-4.8	-4.7	-5.7	-4.9	-3.3	-7.2	-4.9	-3.9
Current transfers	1.2	0.6	0.2	0.7	1.7	0.4	0.1	0.7
Current account balance	-5.7	-6.3	-6.1	-2.1	2.7	-3.9	-4.1	-2.8
Capital account balance	-0.0	-0.0	-0.5	0.2	0.2	0.2	0.0	0.3
Foreign direct investment (net)	11.3	2.1	3.7	8.3	4.7	18.0	5.7	4.5
EUR million, end of period								
Gross external debt	25,738	27,624	33,212	38,818	34,358	35,746	37,672	38,818
Gross official reserves (excluding gold)	22,483	21,189	20,746	24,864	21,101	24,701	24,665	24,864
Months of imports of goods and services								
Gross official reserves (excluding gold)	5.4	4.9	4.0	4.3	4.1	4.3	4.2	3.9
Memorandum item								
EUR million, period total								
Gross domestic product in current prices	78,437	80,268	86,850	98,438	22,965	24,862	25,161	25,450

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiiv, OeNB.

### 3 Hungary: Selective Progress, but Much Remains to Be Done in the Light of Persistent Twin Deficits

Hungary posted robust economic growth at 4.1% in 2005, with most of the moderate slowdown compared to 2004 resulting from calendar effects. Growth was driven by net exports, which benefited particularly from exports to non-EU-25 countries. Growth in domestic demand turned slightly negative, which was mostly attributable to significant destocking (including unspecified items, possibly reflecting also underreported imports), but also to a deceleration of both consumption and gross fixed capital formation. The slowdown in consumption occurred despite a marked acceleration of real wage growth and a modest recovery in employment, and thus may be linked to the decline in the growth of lending to households or weak growth in households' other incomes. Investment activity continued to be supported by highway construction.

Owing to weaker consumption growth, increased competition in the retail sector, a roughly stable exchange rate, smaller wage pressure and the fact that unlike in 2004, no one-off factors were at work, annual average inflation almost halved in 2005 compared to the year before. The inflation rate, hitting 3.3% in December, lay comfortably within the target range of Magyar Nemzeti Bank (MNB) (4.0%  $\pm$  1 percentage point). The inflation rate declined sharply during the first quarter of 2006 to 2.4% by March, reflecting the impact of the cut in the highest VAT rate. Generally, the inflation environment looks fairly favorable. On the supply side, growth in unit labor costs in the whole economy is estimated by the European Commission to slow substantially in 2006 following a modest acceleration in 2005. The decline in headline inflation in 2006 should keep a lid on nominal wage pressures, although the increase in minimum wages by almost 10% in 2006 may exert upward pressure on the overall wage pyramid.<sup>5</sup> The further development of energy prices, however, represents a risk factor on the supply side. On the demand side, accelerating consumption growth in 2006 may slow disinflation, while the longer-term prospects will crucially depend on the policies of the government emerging from April's parliamentary elections.

Notwithstanding these positive developments, Hungary continues to face severe macroeconomic imbalances. Although modestly lower than in 2004, the deficit of the current account remained high in 2005, and there are indications that the deficit is underestimated due to unreported imports. The improvement stemmed from a smaller deficit in the goods and services balance despite adverse terms-of-trade developments, while the largest deficit generator, the income balance, continued to deteriorate. The coverage of the deficit by FDI improved compared to 2004, but this was solely attributable to a large one-off privatization deal in the fourth quarter. As a result, Hungary remains heavily dependent on debt financing, which is reflected in the continued increase in the country's net foreign debt in percent of GDP and which makes it vulnerable to changes in investors' sentiment.

GDP growth driven by net exports

Inflation slows in the first quarter of 2006 due to VAT cut

Twin deficits put policy framework and currency at risk

External financing requirement falls somewhat, but remains high

<sup>5</sup> Furthermore, in 2007, the envisaged cut in employers' social security contributions should ease unit labor costs.

**Credible fiscal consolidation still lacking...**

Fiscal policy continues to be characterized by a weak commitment to credible consolidation. The public sector deficit increased to 6.1% of GDP in 2005 (excluding the costs of the pension reform amounting to 1.4% of GDP). The deviation from the government's original target of 3.6% was largely attributable to changes in the accounting methodology, but also to fiscal slippage of around 0.5% of GDP. For 2006 the government is targeting a deficit of around 5.0%. However, even this target looks to be at risk, especially given parliamentary elections in April and local elections in October 2006. In this context, it should be noted that starting with the first fiscal notification of 2007, Hungary will no longer be able to exclude the net costs of the pension reform from the deficit figures, which will lead to a further perceived deterioration. Also, given that the deficit including these costs will be significantly above the 3% reference value in 2006, these costs cannot be taken into account in the assessment in the framework of the EDP, either. Furthermore, considering that the convergence program remained fairly vague with respect to concrete measures on the revenue and expenditure side, the EU Council urged Hungary to present by September 1, 2006, at the latest, a revised convergence program update that identifies concrete and structural measures that are fully consistent with the medium-term fiscal adjustment path, and in the meantime to do everything necessary to reach the budgetary objectives for the 2006 to 2008 period. A fiscal correction would also be required to lend more credibility to the government's current plan of fulfilling the criteria in time for the adoption of the euro in 2010.

**... making the exchange rate vulnerable**

Encouraged by favorable inflation developments, the MNB continued to gradually cut its policy rate until late September 2005. Since then the policy rate has been left unchanged at 6.0%, reflecting caution in the monetary policy council about the large current account and fiscal deficits and the country's reliance on capital inflows combined with the increase in interest rates in the U.S.A. and the euro area. Hungary's vulnerability to changes in investor sentiment was demonstrated during March 2006, when global portfolio reallocations hit Hungary's currency hardest in the region, causing it to lose around 5% of its value against the euro. Investors' risk appetite, the pace of the correction of economic imbalances and the way they are brought about (i.e. by market pressure or by policy action) will remain crucial for the development of monetary policy during the next few months. Nevertheless, given that a substantial and lasting weakening of the currency would have repercussions not only for medium-term inflation but – in view of the high and increasing role of foreign currency lending to domestic households and enterprises – also for financial stability, the central bank would probably use its instruments against unwelcome exchange rate developments.

Table 5

## Main Economic Indicators: Hungary

	2002	2003	2004	2005	Q1 2005	Q2 2005	Q3 2005	Q4 2005
Year-on-year change of the period total in %								
GDP in constant prices	3.8	3.4	4.6	4.1	3.2	4.5	4.5	4.3
Private consumption	10.6	8.4	3.2	2.4	1.7	3.0	2.8	2.1
Public consumption	5.8	6.2	1.7	-0.3	0.6	-0.4	-0.8	-0.7
Gross fixed capital formation	9.3	2.5	8.4	6.6	6.8	9.4	8.7	3.1
Exports of goods and services	3.9	7.8	16.4	10.6	6.4	11.3	11.5	12.7
Imports of goods and services	6.6	11.1	13.2	5.8	4.2	3.8	7.7	7.3
Contribution to GDP growth in percentage points								
Domestic demand	6.1	6.5	2.6	-0.3	1.1	-2.5	1.2	-0.7
Net exports	-2.3	-3.1	2.1	4.4	2.1	7.0	3.4	5.0
Year-on-year change of the period average in %								
Labor productivity of industry (real)	4.9	8.4	9.7	10.5	4.2	13.6	12.8	11.4
Gross average wage of industry (nominal)	12.6	9.3	10.0	7.2	6.6	8.4	6.7	7.0
Unit labor cost of industry (nominal)	7.4	0.8	0.3	-2.9	2.3	-4.5	-5.4	-3.9
Producer price index (PPI) of industry	-1.1	2.5	3.6	2.9	1.9	3.2	2.6	4.0
Consumer price index (here: HICP)	5.2	4.7	6.8	3.5	3.5	3.6	3.5	3.2
EUR per 1 HUF, + = HUF appreciation	5.6	-4.2	0.7	1.5	6.1	1.0	1.3	-2.3
Period average levels								
Unemployment rate (ILO definition, %, 15–64 years)	5.9	5.9	6.1	7.2	7.1	7.1	7.3	7.3
Employment rate (15–64 years)	56.2	57.0	56.8	56.9	56.4	56.8	57.3	57.1
Key interest rate per annum (%)	9.1	8.6	11.4	7.1	8.6	7.4	6.5	6.0
HUF per 1 EUR	242.9	253.5	251.7	248.0	245.0	249.8	245.6	251.8
Nominal year-on-year change of the period average stock in %								
Broad money (including foreign currency deposits)	10.1	14.2	11.7	13.7	11.3	15.2	13.9	14.3
Contributions to the year-on-year change of broad money in percentage points								
Net foreign assets of the banking system	2.2	-1.1	-1.9	0.6	-0.7	0.6	3.1	-0.7
Domestic credit of the banking system	12.3	22.4	17.9	15.2	14.5	16.8	12.3	17.3
of which:								
claims on the private sector	15.4	18.7	21.7	16.6	17.0	16.8	14.8	17.7
claims on households	6.3	10.6	9.8	7.3	7.0	7.0	7.3	8.1
claims on enterprises	9.1	8.1	11.9	9.2	10.0	9.7	7.6	9.6
claims on the public sector (net)	-3.1	3.7	-3.8	-1.3	-2.5	0.0	-2.5	-0.4
Other domestic assets (net) of the banking system	-4.5	-7.1	-4.3	-2.1	-2.4	-2.3	-1.5	-2.3
% of GDP, ESA 95								
General government revenues	43.6	43.4	44.1	44.5				
General government expenditures <sup>1</sup>	52.0	49.8	49.5	50.6				
General government balance <sup>1</sup>	-8.4	-6.4	-5.4	-6.1				
Primary balance <sup>1</sup>	-4.4	-2.5	-1.2	-2.3				
Gross public debt <sup>1</sup>	55.0	56.7	57.1	58.4				
EUR million, period total								
Merchandise exports	36,821	38,377	45,083	49,794	11,127	12,594	12,492	13,581
Merchandise imports	39,024	41,275	47,534	51,344	11,405	12,942	13,134	13,863
% of GDP, period total								
Trade balance	-3.2	-3.9	-3.0	-1.8	-1.4	-1.6	-2.8	-1.2
Services balance	0.8	-0.5	0.2	0.5	0.5	0.6	0.9	0.1
Income balance (factor services balance)	-5.5	-5.0	-6.0	-6.3	-6.3	-7.3	-5.8	-6.0
Current transfers	0.8	0.8	0.3	0.3	-0.1	0.4	-0.0	0.7
Current account balance	-7.1	-8.7	-8.6	-7.3	-7.2	-7.9	-7.7	-6.4
Capital account balance	0.3	-0.0	0.3	0.8	0.8	0.9	0.3	1.2
Foreign direct investment (net)	4.1	0.6	3.5	4.9	3.1	2.4	2.5	10.9
EUR million, end of period								
Gross external debt	38,559	46,041	55,062	65,938	58,603	63,037	64,446	65,938
Gross official reserves (excluding gold)	9,887	10,108	11,671	15,678	13,223	14,145	14,530	15,678
Months of imports of goods and services								
Gross official reserves (excluding gold)	2.6	2.5	2.5	3.1	2.9	2.8	2.8	2.9
Memorandum item								
EUR million, period total								
Gross domestic product in current prices	69,660	73,508	81,219	87,801	20,263	21,362	22,879	23,295

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiiv, OeNB.

<sup>1</sup> Excluding the net costs of the pension reform.

#### 4 Poland: Strong Growth, Lower Inflation, Smaller External and Fiscal Deficits

In 2005, average annual real GDP growth in Poland was only slightly more than 3% and thus considerably weaker than in 2004. At the same time, Poland registered a sizeable positive contribution of net exports to GDP growth in 2005. However, the contribution of net exports to GDP growth has probably been somewhat overstated (see introduction). Moreover, in the course of 2005, quarterly year-on-year GDP growth and, in particular, domestic demand growth (both consumption and gross fixed capital formation) accelerated significantly. This, in turn, lifted real import growth above real export growth. While this shift led to a negative contribution of net exports to growth in the fourth quarter, the very small deficit of the goods and services balance has not yet widened.

The labor market in a virtuous circle

Improved labor market conditions have been at the center of this pickup in domestic demand. The strong export performance in 2004 following significant currency depreciation and after EU accession decisively supported the start of employment growth in the economy. As the rise in the employment rate has outpaced the increase in the participation rate since the last quarter of 2003, the unemployment rate fell by nearly 3 percentage points until the last quarter of 2005 and declined further in year-on-year terms in the first quarter of 2006. Employment in industry increased in 2005 for the first time since the start of the economic transformation. Rising employment did not trigger a more pronounced acceleration of nominal and real wage growth until the fourth quarter of 2005. The rise in the real wage bill resulting from sustained employment growth and more recently also from stronger wage growth has supported the acceleration of private consumption growth. As of March 2006, disposable incomes have gotten a further stimulus from the rise in pensions and associated benefits that occurred when the cumulated indexation surpassed a threshold. The improvement in the labor market and in real private consumption strengthened the sales expectations of the corporate sector and thus bolstered gross fixed capital formation growth. Moreover, rising transfers from EU structural funds and the recent strong growth of housing loans to households supported the financing of gross fixed capital formation. Higher investment growth, in turn, has underpinned employment growth, thus triggering a virtuous circle.

Inflation at very low levels amid stronger domestic demand

Despite the substantial improvement in the labor market and the more recent acceleration of wage growth, no wage cost pressures have emerged so far. The very strong currency appreciation had put a lid on nominal wage growth until the first quarter of 2005, with the resulting decline in nominal unit labor costs (in industry) decisively contributing to marked disinflation. The more recent increases in production and hence in labor productivity (despite employment growth) are more closely accompanied by an acceleration in wage growth, while still implying a considerable year-on-year decline in nominal unit labor costs (in industry) in the first quarter of 2006. Therefore, annual HICP inflation fell from 3.6% in the first quarter of 2005 to 0.9% in the first quarter of 2006, despite the upward pressure that resulted from the fact that the rise in international energy prices was only partially offset by the currency appreciation. Moreover, despite the recent strengthening of domes-

tic demand, hardly any signs of demand-side inflationary pressures are discernible in the recent development of consumer prices. Conversely, favorable unit labor cost developments additionally supported investment growth on the cost side, and low and further declining inflation further strengthened private consumption growth. Currently, inflation as measured by national CPI (0.4% year on year in March 2005) is substantially below the inflation target of the central bank (2.5%  $\pm$ 1 percentage point). Although the nominal main policy rate was cut in several steps from 6.5% in March 2005 to 4.0% in March 2006, the real key interest rate (e.g. measured by the PPI-deflated or CPI-deflated key rates per month compounded over the past 12 months) increased as a consequence of the persistent disinflation. Both the increase of real interest rates and the nominal and real appreciation of the zloty against the euro during the 12-month period up to March 2006, albeit considerably less pronounced than previously, had a tightening effect on monetary conditions.

In 2005, the fiscal deficit stood at 2.5% of GDP (4.4% of GDP including the net costs of the pension reform) and thus was nearly 1.5 percentage points lower than in 2004. The rise in revenues to GDP exceeded the increase in expenditures to GDP. At the same time, the actual 2005 deficit was lower than the 2005 deficit envisaged in the convergence program of November 2004, which was set at 3.9% of GDP (5.6% of GDP including the net costs of pension reform). However, given the fact that the actual 2004 deficit had also been below target, the narrowing of the deficit from 2004 to 2005 was more or less in line with the targeted reduction envisaged in the convergence program. The updated convergence program of January 2006 envisaged only a tiny further narrowing of the deficit from 2005 to 2006. As the actual 2005 deficit was lower than assumed in the updated convergence program of January 2006, the deficit target for 2006 in fact implies a more or less unchanged deficit level. For 2007 and 2008, the convergence program envisages a moderate narrowing of the deficit to 2.2% and 1.9% of GDP (4.1% and 3.7% of GDP including all net costs of the pension reform), respectively. The reformed Stability and Growth Pact requires the achievement of a deficit (including 100% of the net costs of the pension reform) close to the reference value of 3% of GDP to enable part of these costs (namely 60% in 2007 and 40% in 2008 of forecast total net costs of about 2% of GDP) to be excluded when calculating the deficit that serves as the basis for assessing whether the reference value has been met and whether the current EDP can be abrogated. With regard to the figure including all the net costs of pension reform, the EU Council noted in March 2006 that the convergence program did not envisage the correction of the excessive deficit by 2007, as required by the EU Council recommendation of July 5, 2004. It encouraged Poland to strengthen the adjustment in 2006, in particular by allocating any higher-than-budgeted revenues or lower-than-budgeted expenditure to deficit reduction. The Polish authorities have, at present, not set any specific target date for euro adoption.

**Fiscal performance exceeds expectations, but not yet enough**

Table 6

Main Economic Indicators: Poland								
	2002	2003	2004	2005	Q1 2005	Q2 2005	Q3 2005	Q4 2005
Year-on-year change of the period total in %								
GDP in constant prices	1.4	3.9	5.3	3.2	2.1	2.8	3.7	4.2
Private consumption (excl. NPISH)	3.4	1.9	4.0	2.3	1.7	1.6	2.7	3.1
Public consumption (incl. NPISH)	1.5	4.7	3.9	2.7	3.2	2.8	1.1	3.7
Gross fixed capital formation	-6.3	-0.1	6.3	6.2	1.2	3.8	5.7	9.8
Exports of goods and services	4.8	14.2	14.0	7.2	3.9	9.7	5.6	9.2
Imports of goods and services	2.6	9.3	15.2	3.4	1.1	0.8	0.2	11.3
Contribution to GDP growth in percentage points								
Domestic demand	0.9	2.8	6.1	1.9	1.1	-0.5	1.6	5.0
Net exports	0.5	1.1	-0.8	1.4	1.0	3.4	2.1	-0.8
Year-on-year change of the period average in %								
Labor productivity of industry (real)	7.4	11.4	13.5	2.9	0.2	1.1	3.3	7.2
Gross average wage of industry (nominal)	3.7	3.0	4.5	3.2	2.1	3.2	3.2	4.4
Unit labor cost of industry (nominal)	-3.4	-7.5	-7.9	0.3	1.9	2.1	-0.1	-2.6
Producer price index (PPI) of industry	1.1	2.7	7.1	0.7	3.5	0.1	-0.2	-0.4
Consumer price index (here: HICP)	1.9	0.7	3.6	2.2	3.6	2.2	1.8	1.2
EUR per 1 PLN, + = PLN appreciation	-4.7	-12.4	-2.9	12.6	18.6	13.5	10.1	8.1
Period average levels								
Unemployment rate (ILO definition, %, 15–64 years)	20.3	19.9	19.3	18.0	19.1	18.3	17.6	17.0
Employment rate (15–64 years)	51.5	51.2	51.7	52.8	51.5	52.2	53.7	53.7
Key interest rate per annum (%)	8.8	5.6	5.8	5.3	6.4	5.5	4.8	4.5
PLN per 1 EUR	3.9	4.4	4.5	4.0	4.0	4.1	4.0	3.9
Nominal year-on-year change of the period average stock in %								
Broad money (including foreign currency deposits)	2.0	1.5	6.9	11.8	10.4	12.4	12.2	12.1
Contributions to the year-on-year change of broad money in percentage points								
Net foreign assets of the banking system	0.9	0.1	4.2	5.0	1.9	3.6	6.6	7.4
Domestic credit of the banking system	7.1	5.2	3.6	2.8	0.6	4.4	2.9	3.4
of which:								
claims on the private sector	3.4	3.8	4.0	3.1	0.2	3.1	4.5	4.6
claims on households	2.8	2.5	4.7	4.8	3.6	5.0	5.4	5.2
claims on enterprises	0.5	1.3	-0.6	-1.7	-3.4	-1.9	-0.9	-0.6
claims on the public sector (net)	3.7	1.4	-0.5	-0.3	0.4	1.2	-1.6	-1.2
Other domestic assets (net) of the banking system	-6.0	-3.8	-0.8	4.0	7.9	4.4	2.7	1.3
% of GDP, ESA 95								
General government revenues	41	39.9	38.6	40.8				
General government expenditures <sup>1</sup>	44.2	44.6	42.5	43.3				
General government balance <sup>1</sup>	-3.2	-4.7	-3.9	-2.5				
Primary balance <sup>1</sup>	-0.4	-1.9	-1.3	-0.1				
Gross public debt <sup>1</sup>	39.8	43.9	41.9	42.5				
EUR million, period total								
Merchandise exports	49,324	53,814	65,841	76,742	17,588	18,817	19,222	21,115
Merchandise imports	57,036	58,890	70,393	79,067	17,907	19,503	19,833	21,824
% of GDP, period total								
Trade balance	-3.7	-2.7	-2.2	-1.0	-0.6	-1.2	-1.0	-1.0
Services balance	0.4	0.2	0.4	0.7	0.6	1.0	0.2	0.9
Income balance (factor services balance)	-0.9	-1.7	-4.5	-3.6	-3.6	-3.8	-3.4	-3.6
Current transfers	1.6	1.9	2.2	2.3	1.9	3.1	2.6	1.6
Current account balance	-2.6	-2.1	-4.1	-1.6	-1.8	-0.9	-1.6	-2.1
Capital account balance	-0.0	-0.0	0.4	0.3	0.7	0.1	0.2	0.3
Foreign direct investment (net)	2.0	2.0	4.6	2.5	3.8	0.9	2.9	2.4
EUR million, end of period								
Gross external debt	81,045	84,818	94,322	109,380	97,145	103,321	106,759	109,380
Gross official reserves (excluding gold)	27,367.2	25,999.8	25,904.4	34,536.1	28,407.5	32,957	32,843.5	34,536.1
Months of imports of goods and services								
Gross official reserves (excluding gold)	4.9	4.6	3.9	4.6	4.2	4.4	4.2	4.2
Memorandum item								
EUR million, period total								
Gross domestic product in current prices	209,723	191,261	204,630	240,871	56,180	57,078	59,038	68,575

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiw, OeNB.

<sup>1</sup> Excluding the net costs of the pension reform.

## 5 Slovakia: Booming Economy Displays Some Inflationary Pressures

In 2005, economic growth in Slovakia was slightly stronger than the year before; it picked up in the course of the year. In the fourth quarter of 2005, the country reached its highest quarterly growth rate ever. The favorable economic performance was largely the result of both buoyant private consumption and animated gross fixed capital investment. Accelerating real wages, higher employment and rising credit to private households supported private consumption growth. In 2005 investment growth picked up markedly, rising by around 10 percentage points compared to previous year largely in the wake of the building of two large automotive plants (Peugeot-Citroën and Hyundai-Kia) and of road construction projects. Stock changes contributed almost 4 percentage points to GDP growth in the fourth quarter.<sup>6</sup> On the external side, the negative contribution of net exports to GDP growth marginally decreased in 2005 compared to the year before, while being strongly negative in the fourth quarter of 2005 on the back of strong import growth rates. However, import growth was not only accelerated by strong demand for consumer goods, but also by imports of investment goods related to FDI projects.

As the seventh of the new EU Member States, the Slovak Republic entered the exchange rate mechanism II (ERM II) on November 28, 2005, with a central parity of 38.455 SKK/EUR and a standard fluctuation band of  $\pm 15\%$ . Národná banka Slovenska (NBS) combines ERM II participation with inflation targeting. At this stage, the NBS is targeting an inflation rate below 2.5% for December 2006 and below 2% for end-2007 and end-2008 with a view to meeting the respective Maastricht criterion. Slovakia aspires to introduce the euro on January 1, 2009.

One of the main economic issues is the rise in price pressure in recent months. After a low in inflation in the third quarter of 2005, prices started to increase, coming to levels above 4% year on year in the first quarter of 2006. Core inflation, which excludes the impact of changes of regulated prices and indirect taxes, started to climb as well and amounted to more than 2% at the beginning of 2006 (2005: +1.1%), indicating a more general pickup of price pressures.

The main inflation-driving factors were a 20% hike of gas prices in October, regulated price increases for heating, natural gas and electrical energy as well as higher gasoline prices. Higher housing, health care and education prices pushed inflation, too, as did the rise in excise taxes on spirits and tobacco. Apart from cost-push factors, considering the growth dynamics of credit, wages and employment, there is some risk that demand-pull inflationary pressure has been building up. Compared to many other countries of the region, credit growth to the private sector has been rather low in Slovakia until recently. Lately, however, Slovakia has seen a rise in the growth rate of private bank lending, driven by favorable credit conditions and good economic prospects. Real wage growth was solid. In the industry sector, it went hand in hand with low productivity growth. However, wage growth in the nonindustry sec-

Slovakia enters ERM II and aspires to introduce the euro in 2009

Inflation pickup gives rise to interest rate hike

<sup>6</sup> Higher excise taxes on spirits and tobacco announced for the beginning of 2006 might have encouraged firms to frontload stockbuilding.

tor, and thus in the sector of predominantly nontradable goods, was even stronger than in the industry sector (partly due to the backward indexation of wages to inflation) and was also coupled with relatively low productivity growth, implying some inflationary pressure. To counter inflation and inflationary expectations, the NBS increased its key interest rate by 50 basis points to 3.5% at the end of February, the first interest rate hike since 2002.

**Torn between inflationary pressures and a strengthening of the currency**

ERM II entry and favorable economic prospects coupled with positive investor sentiment toward the region supported the Slovak koruna. From end-November until the beginning of March, the koruna appreciated by more than 3% against the euro and temporarily even fell marginally below 37 SKK/EUR after the abovementioned interest rate move. The currency weakened slightly in March, mainly as a result of external factors (higher interest rates in the euro area and in the U.S.A.), but recovered thereafter. Tightening monetary policy to counteract rising inflationary pressure could result in stronger capital inflows and thus in a further appreciation of the currency, which could eventually harm external price competitiveness if the pass-through from the exchange rate to inflation is incomplete and/or protracted.

**Current account deterioration: presumably just a temporary phenomenon**

In 2005, the current account deficit more than doubled compared to the previous year. High dividend payments of foreign-owned firms had a negative effect on the income balance, while part of these profits were reinvested, thus helping to finance the current account deficit. On the back of high imports and simultaneously decelerating exports, the trade balance added to the deterioration of the current account. However, it can be expected that export growth will pick up in the years to come, as the two large automotive plants that are currently being completed will start exporting in 2006 or in early 2007.

**Despite some risks, fiscal consolidation is likely to move ahead**

At 2.9%, the 2005 budget deficit turned out to be smaller than envisaged in the updated convergence program of December 2005 (4.1%). Since mid-2004, Slovakia has been under the EDP. In January 2006, the EU Council commented on the updated convergence program. The country aims at bringing the deficit below 3% of GDP in 2007, which is in accordance with the EU Council's recommendations. The deficit target for 2006 is 2.9% (exclusive of the costs of the pension reform, which are estimated to come to 1.3% of GDP in 2006). However, the country has to include the net costs of the pension reform from the beginning of the first fiscal notification in 2007. Furthermore, the EU Council suggested that the country improve the structural budgetary adjustment and consequently be able to reach the medium-term objectives. The budget plans face three major uncertainties: first, parliamentary elections in June 2006, which could entail some shift in the authorities' fiscal preferences; second, the extent of EU cofinancing needs, and third, the participation rate of citizens in the second (funded) pillar of the pension system. So far, interest in shifting to the new pension system has been higher than expected. People have to decide whether to enter or not by June 30, 2006.

Table 7

## Main Economic Indicators: Slovakia

	2002	2003	2004	2005	Q1 2005	Q2 2005	Q3 2005	Q4 2005
Year-on-year change of the period total in %								
GDP in constant prices	4.6	4.5	5.5	6.0	5.1	5.1	6.2	7.6
Private consumption	5.5	-0.6	3.5	5.8	5.5	5.6	6.1	5.9
Public consumption	4.9	2.7	1.1	2.0	1.8	0.7	0.9	3.8
Gross fixed capital formation	-0.6	-1.5	2.5	12.4	5.8	10.7	16.5	15.1
Exports of goods and services	5.6	22.5	11.4	10.9	7.2	5.0	16.1	15.0
Imports of goods and services	5.5	13.6	12.7	11.2	7.9	6.9	11.6	17.7
Contribution to GDP growth in percentage points								
Domestic demand	4.7	-2.1	6.3	6.2	5.4	6.7	2.1	10.6
Net exports	-0.1	6.5	-0.8	-0.2	-0.3	-1.6	4.1	-3.0
Year-on-year change of the period average in %								
Labor productivity of industry (real)	6.5	4.9	3.9	0.6	-2.7	-0.3	1.6	3.9
Gross average wage of industry (nominal)	7.3	7.3	10.1	7.3	12.2	5.7	4.9	6.8
Unit labor cost of industry (nominal)	0.7	2.3	6.1	6.6	15.3	6.1	3.2	2.8
Producer price index (PPI) of industry	2.0	8.3	3.4	4.7	2.5	4.1	5.6	6.7
Consumer price index (here: HICP)	3.5	8.4	7.5	2.8	2.8	2.6	2.2	3.7
EUR per 1 SKK, + = SKK appreciation	1.4	2.9	3.6	3.7	5.9	3.0	3.5	2.5
Period average levels								
Unemployment rate (ILO definition, %, 15–64 years)	18.7	17.6	18.2	16.2	17.6	16.3	15.7	15.4
Employment rate (15–64 years)	56.8	57.7	57.0	57.7	56.9	57.4	58.0	58.5
Key interest rate per annum (%)	7.9	6.4	4.9	3.2	3.8	3.0	3.0	3.0
SKK per 1 EUR	42.7	41.5	40.0	38.6	38.3	38.9	38.7	38.5
Nominal year-on-year change of the period average stock in %								
Broad money (including foreign currency deposits)	8.7	5.5	4.0	5.0	5.1	6.2	4.5	4.3
Contributions to the year-on-year change of broad money in percentage points								
Net foreign assets of the banking system	13.5	7.7	-2.6	-5.8	-2.6	-3.9	-8.5	-7.9
Domestic credit of the banking system	-6.5	7.8	10.2	12.1	10.1	12.2	12.2	13.6
of which:								
claims on the private sector	4.9	5.5	4.0	8.1	4.6	6.7	9.3	11.4
claims on households	1.4	2.2	4.0	5.3	4.4	5.0	5.5	6.1
claims on enterprises	3.5	3.2	0.0	2.8	0.1	1.7	3.8	5.4
claims on the public sector (net)	-11.4	2.3	6.1	4.0	5.5	5.4	2.9	2.2
Other domestic assets (net) of the banking system	1.7	-10.0	-3.6	-1.3	-2.4	-2.1	0.8	-1.4
% of GDP, ESA 95								
General government revenues	35.6	35.7	35.9	33.9				
General government expenditures <sup>1</sup>	43.3	39.4	38.9	36.8				
General government balance <sup>1</sup>	-7.7	-3.7	-3	-2.9				
Primary balance <sup>1</sup>	-4.1	-1.2	-0.8	-1.1				
Gross public debt <sup>1</sup>	43.3	42.7	41.6	34.5				
EUR million, period total								
Merchandise exports	15,281	19,370	22,370	25,739	5,598	6,350	6,493	7,298
Merchandise imports	17,540	19,935	23,553	27,717	5,932	6,808	6,676	8,301
% of GDP, period total								
Trade balance	-8.8	-2.0	-3.6	-5.3	-3.8	-5.0	-1.9	-10.1
Services balance	1.9	0.7	0.7	0.7	1.6	-0.0	1.0	0.3
Income balance (factor services balance)	-1.9	-0.4	-1.0	-4.3	-0.1	-6.9	-3.4	-6.3
Current transfers	0.8	0.8	0.4	0.1	0.2	0.0	-0.3	0.4
Current account balance	-8.0	-0.8	-3.5	-8.8	-2.1	-11.9	-4.7	-15.6
Capital account balance	0.4	0.3	0.3	-0.0	-0.1	0.1	-0.0	-0.1
Foreign direct investment (net)	16.6	2.3	3.4	3.8	0.9	8.2	2.9	3.1
EUR million, end of period								
Gross external debt	12,576	14,323	17,446	22,800	21,732	21,691	22,035	22,800
Gross official reserves (excluding gold)	8,497	9,338	10,605	12,578	13,556	12,522	12,684	12,578
Months of imports of goods and services								
Gross official reserves (excluding gold)	5.1	4.9	4.8	4.9	6.1	4.9	5.1	4.1
Memorandum item								
EUR million, period total								
Gross domestic product in current prices	25,742	28,962	33,132	37,303	8,684	9,189	9,451	9,979

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiiw, OeNB.

<sup>1</sup> Excluding the net costs of the pension reform.

## 6 Slovenia: Euro Adoption at the Doorstep

Policy mix conducive to balanced growth, declining inflation

Exports and investments are the most dynamic GDP components

Broad-based disinflation continues

Outward investment activity intensifies

Tax reform is slowing fiscal consolidation in 2006

GDP growth slowed down moderately in 2005 compared to 2004, but at 3.9% was still considerably stronger than in the euro area. Net exports provided the largest contribution to growth, which, however, fell considerably in the second half of the year. Exports increased most strongly to non-euro area EU Member States. Gross fixed capital formation grew most substantially among domestic components, although its growth rate decelerated considerably compared to 2004. The growth rate of investments in machinery and equipment subsided, while investments in residential buildings flourished throughout the year, supported by the increased disbursement of housing loans. Domestic consumption expanded at about the same rate as in 2004, with household and public consumption rising at a roughly equal speed.

Slovenia made considerable progress in disinflation during 2005, with annual average inflation falling to 2.5% from 3.7% in 2004. Inflation was running at an annual rate of 2.0% in March 2006, while the inflation rate excluding energy and unprocessed food stood at 1.3%. Disinflation has been supported by the stability of the exchange rate, prudence in raising regulated prices, the countercyclical adjustment of excise duties (in particular on fuel) and more intense competition in the retail sector. Building on past success represents a major policy challenge. To this end, the authorities have announced limits on increases of government-controlled prices for 2006 to 2007, with the aim of keeping overall administered price growth lower than the increase in market-based prices. Continued productivity-oriented wage setting, especially given the acceleration of unit labor cost growth over the last three quarters of 2005, ongoing fiscal consolidation and the removal of the remaining structural rigidities in the labor and goods markets will have to play an important role in containing inflation pressures further down the road. Also, potential second-round effects of the contemplated changes in VAT rates in 2007 (the direct effect is estimated to come to +0.7 to +0.8 percentage point) need to be avoided.

The deficit on current account is small and almost halved in 2005. The improvement stemmed mainly from an increase in the service surplus, but the trade deficit was also slightly smaller than in 2004, which is remarkable taking into account the marked deterioration in the terms of trade. Slovenia registered a marginal net outflow of FDI in 2005, as Slovenian companies continued to invest abroad while FDI inflows slowed down. Given a relatively large net outflow of portfolio capital (especially as domestic corporates are increasingly investing in securities abroad), the financing of the external deficit relied on other capital inflows, including increased borrowing abroad by banks.

Fiscal policy in Slovenia continues to stand on a relatively sound footing. The public sector deficit amounted to less than 2% in 2005, while public debt levels have remained relatively moderate. According to Slovenia's updated convergence program, the deficit will remain at the same level in 2006, mainly due to the reduction in the payroll tax rate, before gradually falling to 1% by 2008. Over the next three years, Slovenia will implement a tax reform, the major elements of which will be the gradual elimination of the payroll tax, a systemic change in the personal income tax system and changes to the corporate income tax system aimed at promoting investments in research and devel-

opment. Despite the 1999 pension reform, Slovenia is still confronted with contingent liabilities on the grounds of the projected costs of an aging population.

Since entry into ERM II, Slovenia has successfully focused monetary policy on keeping the nominal exchange rate of the tolar stable against the euro. Since early February 2006, Banka Slovenije (BS) has embarked on interest rate cuts “along the lines of nominal convergence prior to the adoption of the euro.” Until end-March 2006, the main refinancing rate and the interest rate on 60-day tolar bills of the BS were reduced by 50 basis points to stand at 3.25% and 3.50%, respectively. The yield on long-term government bonds amounted to 3.8% at the end of March 2006, offering a spread of only three basis points above euro area yields.

Preparations for euro adoption, which is planned for January 1, 2007, currently represent the central theme of and major challenge to economic policy in Slovenia. At the beginning of March 2006, the Slovenian authorities submitted to the EU an official request for a convergence assessment before the summer. Following the necessary procedural steps starting with the publication of the convergence reports of the European Commission and the ECB in mid-May, a final decision on Slovenia’s euro adoption and, in case of a positive assessment, the irrevocable fixing of the conversion rate can be expected for mid-July 2006. Under this scenario, Slovenian authorities, businesses and households would have to undertake the final preparations for euro adoption in the second half of 2006. Following the irrevocable fixing of the conversion rate, Slovenian interest rates, especially short-term interest rates, can be expected to converge to euro area levels by the end of 2006. Given expectations of stable inflation at around 2.5% year-on-year over the next three years according to the updated convergence program, the reduction in nominal interest rates will in all likelihood lead to a decrease in real interest rates as well. This may stimulate domestic demand in an environment of already accelerating real credit growth to the private sector. In addition, as the room for maneuver for domestic monetary policy will disappear, the domestic responsibility for maintaining macroeconomic stability will shift to other economic policy areas to an even greater degree than it already has since the country’s entry into ERM II in June 2004. Further fiscal consolidation, productivity-oriented wage developments, structural reforms and prudential measures in the financial sector are likely to represent core elements of a stability-oriented policy mix.

Monetary policy is being geared to euro adoption

Slovenia prepares for euro adoption

Table 8

Main Economic Indicators: Slovenia								
	2002	2003	2004	2005	Q1 2005	Q2 2005	Q3 2005	Q4 2005
Year-on-year change of the period total in %								
GDP in constant prices	3.5	2.7	4.2	3.9	2.8	5.4	3.6	3.7
Private consumption	1.3	3.4	3.1	3.3	2.9	3.8	3.4	2.8
Public consumption	3.2	1.6	2.9	3.1	2.0	3.1	3.2	3.9
Gross fixed capital formation	0.9	7.1	5.9	3.7	0.6	3.9	1.6	8.2
Exports of goods and services	6.7	3.1	12.5	9.2	8.8	9.6	9.5	8.8
Imports of goods and services	4.8	6.7	13.2	5.3	6.8	1.6	5.9	7.2
Contribution to GDP growth in percentage points								
Domestic demand	2.4	4.9	4.5	1.6	1.6	0.6	1.4	2.9
Net exports	1.1	-2.2	-0.8	2.4	1.2	5.4	2.3	0.8
Year-on-year change of the period average in %								
Labor productivity of industry (real)	5.6	3.5	6.4	5.6	2.5	5.1	5.3	9.6
Gross average wage of industry (nominal)	9.9	7.6	7.1	5.8	6.0	6.0	5.3	5.9
Unit labor cost of industry (nominal)	4.1	4.0	0.7	0.2	3.4	0.8	0.0	-3.4
Producer price index (PPI) of industry	5.3	2.6	4.4	2.8	4.4	2.9	2.0	1.8
Consumer price index (here: HICP)	7.5	5.7	3.7	2.5	2.8	2.2	2.3	2.6
EUR per 1 SIT, + = SIT appreciation	-3.5	-3.4	-2.2	-0.2	-0.9	-0.3	0.2	0.1
Period average levels								
Unemployment rate (ILO definition, %, 15–64 years)	6.5	6.8	6.5	6.7	6.9	5.9	6.5	7.4
Employment rate (15–64 years)	63.4	62.6	65.3	66.0	65.2	66.1	66.6	66.0
Key interest rate per annum (%)	8.4	7.0	4.6	4.0	4.0	4.0	4.0	4.0
SIT per 1 EUR	225.9	233.8	239.1	239.6	239.7	239.5	239.5	239.5
Nominal year-on-year change of the period average stock in %								
Broad money (including foreign currency deposits)	22.8	12.7	5.1	6.6	7.3	6.9	5.0	7.1
Contributions to the year-on-year change of broad money in percentage points								
Net foreign assets of the banking system	11.0	3.3	-8.1	-10.4	-10.1	-11.5	-10.0	-10.1
Domestic credit of the banking system	12.2	8.1	14.0	19.7	17.8	20.7	18.9	21.3
of which:								
claims on the private sector	9.1	8.0	11.5	16.6	14.9	16.6	16.8	18.3
claims on households	1.6	1.5	2.7	4.4	3.8	4.2	4.5	4.9
claims on enterprises	7.5	6.5	8.8	12.3	11.1	12.4	12.2	13.4
claims on the public sector (net)	3.2	0.1	2.4	3.1	3.0	4.1	2.2	3.0
Other domestic assets (net) of the banking system	-0.4	1.3	-0.8	-2.7	-0.4	-2.3	-3.9	-4.1
% of GDP, ESA 95								
General government revenues	45.3	45.3	45.3	45.5				
General government expenditures	48	48.1	47.6	47.3				
General government balance	-2.7	-2.8	-2.3	-1.8				
Primary balance	-0.3	-0.7	-0.5	-0.1				
Gross public debt	29.7	29.1	29.5	29.1				
EUR million, period total								
Merchandise exports	11,082	11,414	12,933	14,517	3,350	3,745	3,572	3,850
Merchandise imports	11,351	11,960	13,942	15,551	3,534	3,847	3,821	4,348
% of GDP, period total								
Trade balance	-1.1	-2.2	-3.9	-3.8	-2.9	-1.4	-3.6	-7.1
Services balance	2.6	2.2	2.6	3.3	2.7	3.2	3.6	3.6
Income balance (factor services balance)	-0.6	-0.7	-1.0	-0.8	-0.9	-1.4	-0.3	-0.8
Current transfers	0.6	0.4	0.1	0.2	-0.8	0.2	1.3	0.2
Current account balance	1.4	-0.4	-2.1	-1.1	-2.0	0.5	1.0	-4.0
Capital account balance	-0.7	-0.7	-0.4	-0.5	-0.1	-0.4	-0.4	-0.9
Foreign direct investment (net)	6.7	-0.5	0.8	-0.1	-2.8	0.1	0.1	2.0
EUR million, end of period								
Gross external debt	11,483	13,260	15,278	19,511	16,313	17,032	18,436	19,511
Gross official reserves (excluding gold)	6,702	6,798	6,464	6,824	6,515	6,677	6,800	6,824
Months of imports of goods and services								
Gross official reserves (excluding gold)	6.1	5.9	4.8	4.6	4.9	4.6	4.5	4.2
Memorandum item								
EUR million, period total								
Gross domestic product in current prices	23,695	24,857	26,144	27,373	6,369	7,071	6,938	6,995

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiw, OeNB.

## 7 Bulgaria: Robust Economic Growth alongside Fiscal Surpluses, High and Rising External Deficits and a Pickup in Inflation

In Bulgaria real GDP grew by 5.5% in 2005. Annual growth peaked in the second quarter, but the destructive summer floods caused economic activity to decelerate substantially in the third quarter and exports to slacken. The growth of gross fixed capital formation remained very buoyant at almost 20% in 2005, soaring in the second half of the year. Real annual import growth stayed very high. As real annual export growth decreased sharply, reaching a low in the third quarter, the deterioration in net exports was significant compared to the previous year. The underlying reason for this economic development was high domestic consumption fueled by credit expansion, which also caused the current account deficit to widen further.

High domestic demand fueled by credit expansion

The current account deficit expanded sharply in 2005 due to the further deterioration of the trade balance on the back of rapidly rising imports and more moderate export growth. The continuing worsening of the trade balance reflected ongoing strong domestic demand for capital and consumer goods as well as rising oil prices (expenditures for energy imports doubled against 2004) and sweeping floods that disrupted exports temporarily. As in the years before, the current account displayed a seasonal pattern: The high deficit in the first, second and fourth quarters was partly offset by a huge surplus of the service balance in the third quarter stemming from revenues from tourism. In the first months of 2006, the current account deficit has apparently widened further.

Current account deficit widens to almost 12% of GDP in 2005, raising concerns

The sizeable trade deficit in 2005 reflects soaring imports of investment goods, but also lastingly high imports of consumer goods driven by the rapid growth of credits, in particular to households (see below).

On the financing side, in 2005 net FDI inflows dropped, but remained comparatively high, covering about 70% of the current account deficit. While privatization in Bulgaria is gradually coming to the end, solid large and stable inflows not stemming from privatization were registered in 2005. Also, Bulgaria's gross external debt amounted to 68% of GDP compared to 64% in 2004. A breakdown shows that public external debt continued to decline, as in the past years, while private external debt rose significantly, reflecting the banking sector's foreign funding of domestic credit growth.

Containing credit growth remains a key challenge for the Bulgarian authorities and the main issue in their discussions with the IMF. Since the beginning of 2004, the Bulgarian National Bank (BNB) has adopted a series of primarily prudential and administrative measures to keep credit growth in check and succeeded in curbing credit growth to nongovernment nonbanks from 47.7% year on year at the end of 2004 to 33.8% a year later. The measures to contain commercial banks' credit activity included tightening their reserve requirements and introducing ceilings for annual credit growth (introduced in April 2005) as well as making regulations on capital adequacy and risk exposures more stringent. In the context of the second review of the Stand-By Arrangement earlier this year, the BNB revised its credit growth projection and agreed to reduce credit expansion to 17.5% in full year 2006.

Credit growth is slowing down and should be reduced to 17.5% in full year 2006

Considering the very limited room for maneuver for monetary policy under a currency board, tight fiscal policy has played an active role in controlling demand, both domestic and external. The Bulgarian government, which has run increasing budget surpluses for the last few years, agreed to further tighten fiscal policy in 2006 with the IMF and is now aiming at a fiscal surplus of 3% of GDP.

**Excise duty hikes  
boosted inflation in  
February**

In Bulgaria average annual HICP inflation decelerated in 2005 compared to 2004. After inflation had declined to 3.3% in January 2005, it rose gradually again to reach 6.4% year on year at end-2005. This trend continued in the first months of 2006. Inflation increased to 8.7% year on year in February and eased only slightly in March. The major factors driving up inflation in 2005 were cyclical and one-off factors, i.e. the high demand growth caused by the summer floods in 2005 combined with food price hikes and the sharp rise in energy prices. The increases in indirect taxes at the beginning of 2006 added to inflationary pressures. The government decided to sharply raise excise duties on cigarettes one year earlier than initially scheduled, arguing that it intended to harmonize indirect taxes with minimum levels in the EU early on so as to create better conditions for further nominal convergence after accession to the EU. This strategy seems reasonable, but it also introduced some added risk of further price increases. According to the central bank, average annual inflation is forecast to decline to about 6% in 2006.

Table 9

## Main Economic Indicators: Bulgaria

	2002	2003	2004	2005	Q1 2005	Q2 2005	Q3 2005	Q4 2005
Year-on-year change of the period total in %								
GDP in constant prices	4.9	4.5	5.7	5.5	5.9	6.5	4.6	5.5
Individual consumption	3.4	7.1	4.9	7.4	7.1	5.8	9.4	7.1
Collective consumption	6.0	3.0	6.7	2.2	6.4	6.5	4.3	-4.7
Gross fixed capital formation	8.5	13.7	13.5	19.0	11.2	16.9	24.0	21.5
Exports of goods and services	7.2	7.9	13.0	7.2	9.2	12.0	1.1	8.9
Imports of goods and services	4.9	15.3	14.1	14.6	10.8	15.3	18.8	12.9
Contribution to GDP growth in percentage points								
Domestic demand	4.3	12.1	9.5	14.8	11.0	14.4	19.6	12.5
Net exports	0.6	-7.6	-4.0	-9.2	-5.1	-7.9	-15.0	-7.0
Year-on-year change of the period average in %								
Labor productivity of industry (real)	2.7	12.6	16.9	1.9	2.0	2.4	0.7	2.7
Gross average wage of industry (nominal)	3.5	3.8	7.1	7.2	6.4	7.0	7.7	7.9
Unit labor cost of industry (nominal)	0.8	-7.8	-8.3	5.2	4.4	4.5	6.9	5.1
Producer price index (PPI) of industry	1.4	5.0	5.9	7.1	6.2	6.9	6.7	8.4
Consumer price index (here: HICP)	5.8	2.3	6.1	5.0	3.8	4.9	4.8	6.6
EUR per 1 BGN, + = BGN appreciation	-0.1	0.0	-0.2	-0.1	-0.2	-0.3	0.0	0.0
Period average levels								
Unemployment rate (ILO definition, %, 15-64 years)	18.3	13.9	12.2	10.2	11.5	10.1	9.3	10.0
Employment rate (15-64 years)	50.6	52.5	54.2	55.8	53.1	56.2	57.8	56.0
Key interest rate per annum (%)	4.0	2.7	2.6	2.1	2.2	2.0	2.0	2.0
BGN per 1 EUR	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0
Nominal year-on-year change of the period average stock in %								
Broad money (including foreign currency deposits)	18.3	16.3	22.3	27.3	26.3	29.5	27.1	26.5
Contributions to the year-on-year change of broad money in percentage points								
Net foreign assets of the banking system	7.7	5.4	4.4	8.9	6.7	8.9	11.3	8.6
Domestic credit of the banking system	12.1	14.5	21.8	25.8	25.4	28.2	23.6	26.0
of which:								
claims on the private sector	13.6	19.9	26.3	27.9	31.0	32.7	25.0	23.6
claims on households	3.3	5.9	10.0	13.0	11.9	13.7	13.1	13.1
claims on enterprises	10.3	14.0	16.3	14.9	19.0	19.0	11.9	10.5
claims on the public sector (net)	-1.5	-5.4	-4.5	-2.1	-5.6	-4.5	-1.4	2.4
Other domestic assets (net) of the banking system	-1.5	-3.6	-3.8	-7.4	-5.8	-7.6	-7.8	-8.2
% of GDP, ESA 95								
General government revenues	43.3	44.3	45.5	46.1				
General government expenditures	43.2	44.0	43.6	43.0				
General government balance	0.1	0.3	1.9	3.1				
Primary balance	2.3	2.4	3.7	4.8				
Gross public debt	54.0	46.1	38.6	29.9				
EUR million, period total								
Merchandise exports	6,063	6,668	7,985	9,454	2,081	2,305	2,415	2,654
Merchandise imports	7,941	9,094	10,938	13,823	2,785	3,420	3,588	4,030
% of GDP, period total								
Trade balance	-11.3	-13.7	-15.1	-20.4	-15.7	-22.2	-19.5	-23.2
Services balance	3.1	3.1	3.5	3.1	-1.7	4.4	11.0	-2.3
Income balance (factor services balance)	2.4	1.6	1.2	1.2	1.3	1.8	0.8	0.8
Current transfers	3.4	3.5	4.5	4.3	3.8	4.8	4.0	4.6
Current account balance	-2.4	-5.5	-5.8	-11.8	-12.3	-11.3	-3.8	-19.9
Capital account balance	0.0	-0.0	0.0	-0.0	0.0	-0.0	0.0	-0.0
Foreign direct investment (net)	5.7	10.3	11.5	8.7	8.4	7.3	10.9	7.7
EUR million, end of period								
Gross external debt	10,769	10,641	12,572	14,530	13,120	13,589	13,550	14,530
Gross official reserves (excluding gold)	4,247	4,981	6,443	6,816	6,325	6,990	6,795	6,816
Months of imports of goods and services								
Gross official reserves (excluding gold)	5.2	5.3	5.7	4.9	5.6	5.2	4.6	4.3
Memorandum item								
EUR million, period total								
Gross domestic product in current prices	16,589	17,727	19,594	21,448	4,476	5,022	6,010	5,939

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiiv, OeNB.

## 8 Romania: Weaker but still Robust Growth, Very Gradual Disinflation and Stubborn External Imbalances

GDP growth slowed in 2005 compared to the previous year but is still robust. The slowdown is mainly attributable to external shocks (unfavorable weather, heavy floods) which affected the agricultural sector. Output in agriculture declined by almost 14% year on year in 2005 after the country had seen record agricultural production in 2004. Thus, the strong output decline was also due to base effects. Growth was mainly driven by domestic demand. Private consumption was fueled by both strong wage and credit growth. Real wages in industry advanced by around 7% on average in 2005. Credit growth to the private sector remained strong, showing a rise by around 40% in 2005. Investment rose quickly due to reconstruction work after the flood, but also because of the progress made in restructuring the corporate sector. Export growth moderated, and the contribution of external demand to GDP growth remained negative, as imports expanded dynamically.

Further very small steps  
toward disinflation

In 2005, disinflation was very gradual and inflation remained at comparatively high levels. This trend continued in the first quarter of 2006, with year-on-year inflation just below 9%. In late 2005 and early 2006 inflation was mainly driven by increases in administered prices, volatile food prices and generally high domestic demand.

The Banca Națională a României (BNR) switched to an explicit inflation targeting strategy in August 2005, after having practiced a form of “implicit” inflation targeting for some time. With year-end inflation at 8.6%, Romania slightly overshoot the 2005 target of 7.5%  $\pm$ 1% at year-end, which had already been revised upward from 7.0%  $\pm$ 1% in the second half of 2005. For 2006 and 2007, the year-end inflation targets are 5%  $\pm$ 1% and 4%  $\pm$ 1%, respectively. These goals seem ambitious, given inflation developments in the first quarter of 2006. In addition, the current floods in parts of Romania could again hamper agricultural production and push up food prices. Rising oil prices and higher-than-expected hikes in administered prices could also be obstacles for further disinflation. Currently, the BNR projects 2006 inflation to come in at 6.5%.

The current account  
needs attention

Standing at almost 9% of GDP in 2005, the current account deficit is mainly due to the high deficit in the trade balance. Strong domestic demand and a marked nominal appreciation of the leu against the euro (about 12% on average in 2005 compared to 2004) spurred imports, while curbing export dynamics. The appreciation of the real effective exchange rate was even stronger due to the inflation differential with Romania’s main trading partners. On the back of surging imports, the trade deficit nearly doubled in the first two months of 2006 compared to the corresponding period of the previous year (in euro terms). At the same time, the FDI coverage of the current account is high at around 75% in 2005. In the short run, therefore, the financing of the deficit does not pose a serious problem. For 2006, high FDI inflows are expected, as, for instance, payments related to the privatization of Banca Comercială Română, which was bought by Austria’s Erste Bank at the end of 2005, will be effected during the course of the year.

The BNR faces conflicting objectives. In the context of inflation targeting, the exchange rate matters in as much as it impacts on inflation developments. At times, however, upward pressures on the currency may be perceived as too strong and harmful to the real economy, in particular if the exchange rate pass-through is swift and large in the case of a depreciation, whereas it is slow and incomplete if the currency appreciates. According to the BNR, there are signs of such an asymmetric pass-through in Romania.

High inflation rate combined with a strong currency

In 2005, the BNR undertook several measures to combat inflation. Administrative measures served to moderate high growth rates of private credit. The main focus was to bring down foreign currency lending, not only for macro-economic but also for prudential reasons. The reserve requirements for foreign currency-denominated liabilities have been raised in two steps from 30% to 40%, and a ceiling of 300% of own funds for credit institutions' foreign currency lending has been adopted. The measures have had some effect on the currency composition of household credits.

In view of strong capital inflows, the key interest rate was cut by 100 basis points to 7.5% in September 2005. After this, the leu depreciated slightly toward the end of 2005, but strengthened again in early 2006. The BNR reversed its interest rate move in February 2006 and increased the rate by 100 basis points. This step was motivated by persistent inflation pressures and the need to cope more actively with price dynamics. It remains to be seen how effective this move is, given that higher interest rates could lead to stronger capital inflows and thus upward pressure on the currency and/or to widening monetary aggregates.

The Stand-By Arrangement between Romania and the IMF concluded in July 2004 has presently veered off track. According to the IMF, Romania should use monetary policy (more) actively to fight inflation. Furthermore, the IMF urges further fiscal tightening and wage moderation. In the case of fiscal policy, this means a balanced budget for 2006 and small surpluses over the medium run.

Discussions between the Romanian authorities and the IMF

The current Stand-By Arrangement with the IMF is scheduled to expire in June. Discussions about a new agreement are still going on. After consultations in March, the Romanian authorities saw only "small differences" between the positions. Further talks are to be held before the summer and will center around the Romanian authorities' recent revision of the 2006 projected budget deficit from 0.5% to 0.9% of GDP and the planned increase in public sector wages of 12% to 15% compared to 2005 averages.

In 2005 the budget deficit was slightly lower than projected, standing at 0.4% of GDP (due to high domestic demand growth, VAT revenues were higher than expected), and was therefore in line with the deficit target of 0.7% agreed with the IMF.

Table 10

Main Economic Indicators: Romania								
	2002	2003	2004	2005	Q1 2005	Q2 2005	Q3 2005	Q4 2005
Year-on-year change of the period total in %								
GDP in constant prices	5.2	5.2	8.4	4.1	6.0	4.5	2.4	4.3
Private consumption	5.6	8.4	14.1	9.7	13.7	12.7	8.2	6.5
Public consumption	2.7	7.7	4.9	4.4	4.0	2.5	3.7	6.2
Gross fixed capital formation	7.6	8.6	10.7	13.1	5.2	8.9	10.8	21.3
Exports of goods and services	17.1	8.4	13.9	7.6	8.8	3.3	8.4	9.8
Imports of goods and services	11.8	16.0	22.1	17.2	18.4	16.1	17.4	17.2
Contribution to GDP growth in percentage points								
Domestic demand	4.3	8.8	12.9	9.1	11.8	11.4	6.7	8.2
Net exports	0.9	-3.6	-4.5	-5.0	-5.9	-6.9	-4.3	-3.9
Year-on-year change of the period average in %								
Labor productivity of industry (real)	5.4	5.2	7.1	4.4	6.1	2.2	2.8	6.5
Gross average wage of industry (nominal)	23.6	19.5	23.0	16.8	15.5	16.6	17.0	18.1
Unit labor cost of industry (nominal)	17.2	13.6	14.8	11.9	8.8	14.1	13.9	10.9
Producer price index (PPI) of industry	23.2	19.6	19.1	10.8	13.5	11.6	9.0	9.1
Consumer price index (here: HICP)	22.5	15.3	11.9	9.1	8.9	9.9	9.0	8.5
EUR per 1 RON, + = RON appreciation	-16.8	-16.8	-7.3	11.8	9.4	12.3	16.3	9.5
Period average levels								
Unemployment rate (ILO definition, %, 15–64 years)	9.1	7.5	8.5	7.5	8.9	7.5	6.5	7.2
Employment rate (15–64 years)	57.6	57.6	57.7	57.6	56.6	58.8	57.8	57.2
Key interest rate per annum (%)	29.6	18.8	20.4	10.0	15.8	8.6	8.0	7.7
RON per 1 EUR	3.1	3.8	4.1	3.6	3.7	3.6	3.5	3.6
Nominal year-on-year change of the period average stock in %								
Broad money (including foreign currency deposits)	40.9	31.2	31.5	41.9	40.8	44.8	41.6	40.5
Contributions to the year-on-year change of broad money in percentage points								
Net foreign assets of the banking system	31.8	15.5	12.9	21.1	23.1	22.5	18.4	20.8
Domestic credit of the banking system	18.7	23.9	26.0	17.1	12.9	15.2	16.5	22.7
of which:								
claims on the private sector	24.1	28.2	32.2	26.7	22.7	25.3	26.6	31.1
claims on households	..	10.0	13.1	13.2	9.4	11.8	14.3	16.3
claims on enterprises	..	18.2	19.1	13.5	13.2	13.5	12.3	14.8
claims on the public sector (net)	-5.3	-4.3	-6.2	-9.5	-9.8	-10.1	-10.1	-8.4
Other domestic assets (net) of the banking system	-9.6	-8.3	-7.4	3.7	4.9	7.1	6.7	-2.9
% of GDP, ESA 95								
General government revenues	36.7	36.2	36.1	19.6				
General government expenditures	38.7	37.9	37.4	20.0				
General government balance	-2.0	-1.7	-1.3	-0.4				
Primary balance	0.2	0.0	0.0	0.5				
Gross public debt	23.8	20.7	18.0	15.2				
EUR million, period total								
Merchandise exports	14,644	15,614	18,935	22,255	5,098	5,433	5,931	5,793
Merchandise imports	17,392	19,569	24,258	30,061	6,155	7,450	7,678	8,778
% of GDP, period total								
Trade balance	-5.7	-7.6	-8.7	-9.8	-7.7	-11.5	-7.8	-11.6
Services balance	0.0	0.1	-0.3	-0.5	-0.9	-0.7	-0.0	-0.7
Income balance (factor services balance)	-1.0	-1.2	-4.2	-2.9	-2.4	-2.9	-2.3	-3.7
Current transfers	3.4	3.1	4.9	4.6	4.8	4.5	4.1	5.0
Current account balance	-3.4	-5.5	-8.4	-8.7	-6.2	-10.6	-6.1	-10.9
Capital account balance	0.2	0.4	0.8	0.7	0.6	1.0	0.5	0.9
Foreign direct investment (net)	2.5	3.1	8.4	6.6	3.5	5.7	5.2	9.9
EUR million, end of period								
Gross external debt	15,417	16,311	18,120	24,460	20,455	22,063	22,982	24,460
Gross official reserves (excluding gold)	5,877	6,374	10,848	16,796	12,562	13,771	16,647	16,796
Months of imports of goods and services								
Gross official reserves (excluding gold)	3.6	3.4	4.8	5.9	5.3	4.9	5.7	5.0
Memorandum item								
EUR million, period total								
Gross domestic product in current prices	47,970	52,246	60,892	79,465	13,754	17,538	22,362	25,811

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiw, OeNB.

## 9 Croatia: Increasing Inflation and Foreign Debt

GDP growth was slightly higher in 2005 than in 2004 and accelerated considerably from 1.4% in the first quarter to around 4% in the remainder of 2005, chiefly due to the increasing contributions by private consumption and gross fixed capital formation. At the same time, public consumption and net exports were only of minor importance for GDP growth. Despite this performance, labor market conditions remained broadly unchanged and unemployment stayed at high levels. The general government deficit decreased by 1.1 percentage points from 2004 to 2005, mainly due to cuts in expenditures. Croatia introduced a rolling three-year budget in 2005. Croatia's 2005 Pre-Accession Economic Programme provides for further gradual fiscal consolidation.

The Stand-By-Arrangement with the IMF was extended to October 2006 following the completion of the second review in March 2006. The second review provided an overall positive assessment of Croatia's economic development and acknowledged the efforts for fiscal consolidation and structural reform, including reforms of the pension and health-care systems and of the railways, and the reduction of state subsidies. However, it also underlines slow progress with privatization and the vulnerabilities related to Croatia's external position.

Gross foreign debt increased slightly again in 2005 (82.4% of GDP against 80.2% in 2004) as a result of the rise in the private sector's net foreign indebtedness. At the same time, gross public foreign debt declined substantially over the last year, outpacing the drop in total public debt. This seems to be due to a shift from euro bonds issued abroad to bonds issued domestically and bought by domestic banks, which in turn finance themselves abroad. However, commercial banks use funds from abroad also to lend both to households and to nonfinancial corporations in spite of a series of administrative measures taken in 2004 and early 2005 to stem foreign borrowing. The latest measure to slow down bank lending was taken in early February 2006, when the central bank imposed a special reserve requirement of 55% to be allocated by banks on net new issues of securities. In addition, direct external borrowing by the nonfinancial corporate sector expanded rapidly as well in 2005 and in early 2006.

The consumer price index accelerated noticeably in 2005 compared to the previous years; in the last quarter of 2005, inflation came in at 4.0%. The reasons for these dynamics are manifold. First, oil price increases feature prominently among the explanations. Second, food prices recorded above-average increases. This would not be too surprising, given that oil price increases affect retail- and transport-intensive goods such as dairy products most. However, soaring meat prices had a greater impact on food prices. Third, higher inflation rates are due to increases in administered prices. Disaggregated CPI data indicate double-digit price hikes for housing rents, water supply and medical services as well as above-average price increases for electricity. This development can be explained by health-care reforms and the attempt to close the gap to price recovery costs for some public services. Not only regulated prices but also market-based services such as education, catering, insurance and financial services recorded strong inflation rates, perhaps due to economic catching-up. In early 2006, price pressures seem to have subsided somewhat, as inflation

IMF Stand-By  
Arrangement extended

Foreign debt still rising

Inflation on the rise: Just  
a temporary  
phenomenon?

decreased from 3.9% in January 2006 to 3.0% in March 2006 due to lower food price inflation.

**The risk of a more persistent increase cannot be ruled out**

However, the rate of core inflation, rising hand in hand with headline inflation from mid-2004, remained unchanged at 3.1% in December 2005 through January and February 2006. The danger of the inflation rate persisting above 3% cannot be ruled out, given possible further increases in energy prices or second-round effects triggered by recent increases. Moreover, there is a need to modernize public services and the related capital stock, which will lead to higher administered prices. Long-term pressure on inflation also comes from market-based service price inflation due to productivity gains and from rising demand for services as GDP per capita rises. However, this effect will unfold only gradually, given the low weight of services.

**Monetary policy and the exchange rate**

Persistent inflation pressures may pose risks because monetary policy has only limited tools in Croatia to counteract rising inflation and inflationary expectations. Price stability in Croatia is achieved by maintaining the nominal exchange rate stable against the euro in a de facto narrow band. This has a doubly stabilizing effect. First, stable nominal exchange rates anchor domestic inflation by keeping the price of imported tradable goods stable. This channel is very important in Croatia, as the weight of imported goods is thought to be unusually high in the CPI in view of the country's narrow manufacturing base and, as a result, of the large share of imported goods (reflected in structurally high trade deficits). Second, stable exchange rates provide a nominal anchor for inflationary expectations both in the tradable and the nontradable sectors.

**Monetary policy and interest rate policy**

At the same time, interest rate policy is very much constrained in Croatia under the country's monetary policy strategy. The central bank's key interest instrument, the discount rate, has not been changed since October 2002, (4.5%), whereas money market rates varied from 0% to roughly 10% despite the recent introduction of an interest rate corridor. However, the corridor only reflects observed money market fluctuations.

**Monetary policy and currency substitution**

Moreover, because of the high share of foreign exchange-denominated deposits and loans in total deposits and loans, the exchange rate cannot be used easily to stem inflation. An appreciation of the kuna would increase the net wealth of holders of foreign exchange deposits in domestic currency and would thus spur bank lending in domestic currency, which would put further pressure on inflation (if loans are used to purchase e.g. real estate). At the same time, booming lending coupled with cheaper imported goods resulting from nominal appreciation would lead to a widening of the trade deficit and would thus boost foreign debt further.

Table 11

## Main Economic Indicators: Croatia

	2002	2003	2004	2005	Q1 2005	Q2 2005	Q3 2005	Q4 2005
Year-on-year change of the period total in %								
GDP in constant prices	5.6	5.3	3.8	4.3	1.8	5.1	5.2	4.8
Private consumption	7.7	4.6	3.9	3.4	2.4	4.4	3.8	3.2
Public consumption	4.9	1.3	-0.3	0.8	-0.1	1.0	1.0	1.4
Gross fixed capital formation	13.9	24.7	4.4	4.8	0.3	3.2	5.8	9.9
Exports of goods and services	1.2	11.4	5.4	4.6	1.0	6.7	4.9	4.9
Imports of goods and services	13.4	12.1	3.5	3.5	2.1	5.8	2.3	3.6
Contribution to GDP growth in percentage points								
Domestic demand	12.3	7.2	3.4	4.2	2.7	5.8	3.3	5.0
Net exports	-6.7	-1.8	0.4	0.1	-0.9	-0.8	1.9	-0.2
Year-on-year change of the period average in %								
Labor productivity of industry (real)	7.8	3.5	4.0	7.2	2.6	11.3	7.6	7.5
Gross average wage of industry (nominal)	6.9	5.4	5.5	5.3	5.6	5.0	5.4	5.4
Unit labor cost of industry (nominal)	-0.8	1.8	1.5	-1.8	3.0	-5.6	-2.1	-2.0
Producer price index (PPI) of industry	-0.5	1.9	3.6	3.1	5.0	3.2	2.0	2.3
Consumer price index (here: CPI)	1.7	1.8	2.1	3.4	3.1	3.1	3.5	4.0
EUR per 1 HRK, + = HRK appreciation	1.0	-2.1	1.0	1.3	1.4	1.2	0.3	2.3
Period average levels								
Unemployment rate (ILO definition, %, 15–64 years)	15.1	14.5	14.1	..	..	13.4	..	..
Employment rate (15–64 years)	53.4	53.4	54.7	..	..	54.8	..	..
Key interest rate per annum (%)	5.6	4.5	4.5	4.5	4.5	4.5	4.5	4.5
HRK per 1 EUR	7.4	7.6	7.5	7.4	7.5	7.3	7.4	7.4
Nominal year-on-year change of the period average stock in %								
Broad money (including foreign currency deposits)	32.4	11.3	8.3	9.5	8.5	9.3	9.9	10.3
Contributions to the year-on-year change of broad money in percentage points								
Net foreign assets of the banking system	9.8	-7.7	-0.5	-5.0	-1.7	-6.4	-6.0	-6.0
Domestic credit of the banking system	23.2	19.5	9.4	17.3	12.6	18.1	18.6	19.6
of which:								
claims on the private sector	21.5	17.7	10.1	13.2	11.4	12.0	13.6	15.4
claims on households	11.3	11.9	7.5	9.0	7.8	8.6	9.6	10.0
claims on enterprises	10.2	5.8	2.6	4.1	3.6	3.4	4.0	5.4
claims on the public sector (net)	1.7	1.8	-0.7	4.1	1.2	6.1	5.0	4.2
Other domestic assets (net) of the banking system	-0.5	-0.5	-0.7	-2.7	-2.4	-2.4	-2.7	-3.3
% of GDP, ESA 95								
General government revenues	43.3	41.6	39.9	40.8				
General government expenditures	47.4	46.1	44.9	44.7				
General government balance	-4.1	-4.5	-5.0	-3.9				
Primary balance	-2.0	-2.5	-2.9	-1.6				
Gross public debt	40.1	40.9	43.7	44.2				
EUR million, period total								
Merchandise exports	5,293	5,572	6,603	7,244	1,524	1,891	1,871	1,958
Merchandise imports	11,254	12,546	13,331	14,727	3,093	3,976	3,720	3,938
% of GDP, period total								
Trade balance	-24.4	-26.6	-23.7	-24.2	-23.1	-26.9	-21.5	-25.3
Services balance	13.4	18.8	16.6	17.2	0.1	14.5	46.2	2.8
Income balance (factor services balance)	-2.3	-4.1	-2.2	-3.1	-4.1	-6.7	-1.5	-0.7
Current transfers	4.7	4.7	4.2	3.8	4.4	4.1	3.1	3.7
Current account balance	-8.6	-7.1	-5.1	-6.3	-22.7	-14.9	26.3	-19.5
Capital account balance	2.1	0.3	0.1	0.2	0.0	0.0	0.0	0.5
Foreign direct investment (net)	2.4	6.5	2.5	3.8	2.6	8.2	3.6	0.8
EUR million, end of period								
Gross external debt	15,055	19,811	22,781	25,508	23,143	24,260	24,080	25,508
Gross official reserves (excluding gold)	5,651	6,554	6,436	7,438	6,700	7,066	6,999	7,438
Months of imports of goods and services								
Gross official reserves (excluding gold)	4.9	5.2	4.8	5.1	5.4	4.6	4.7	4.8
Memorandum item								
EUR million, period total								
Gross domestic product in current prices	24,456	26,221	28,405	30,959	6,783	7,756	8,593	7,826

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiiv, OeNB.

## 10 Turkey: Solid Economic Performance above Expectations, Driven by Consumption

Annual real GDP growth slowed in 2005 compared to 2004, but picked up in the second half of 2005.<sup>7</sup> In 2005, the growth rates of private consumption intensified markedly alongside gross fixed capital formation, which gained speed during the whole year as corporations expanded capacity. This development offset the negative contribution of net exports to growth. The composition of growth, which had become considerably more balanced in the second half of 2004 as a result of the moderate growth of domestic demand, remained broadly the same in 2005. Macroeconomic stabilization is supported by a three-year Stand-By Arrangement with the IMF, which was concluded in spring 2005 and which will be reviewed for the third time this May. This program envisages a switch toward more export-led growth over the program period.

Success story in reducing inflation, but recently noticeably above target range

HICP inflation stood at 7.1% year-on-year in December 2005, the lowest rise in more than three decades. In the first quarter of 2006, average inflation accelerated to 7.6% and was thus above the inflation target range, which came into force at the beginning of 2006, shortly after the central bank, Türkiye Cumhuriyet Merkez Bankası (TCMB), declared that it would move to an explicit inflation targeting framework. The TCMB is committed to reducing inflation to 5% by the end of this year; the target is operated with a band of  $\pm 2\%$ . The TCMB expects that the recent sectoral cut in VAT rates in the textile, ready-to-wear and leather sectors and the continued absence of significant secondary effects of oil price increases will favorably impact inflation in the short term. At the end of April, the TCMB cut its key interest rate by 25 basis points to a historical low of 13.25%, as the underlying disinflation process remains intact. This reduction was expected and was broadly priced in by the markets. In the course of 2005, the TCMB lowered the overnight borrowing rate several times from 17.0% to 13.5%.

The Turkish lira appreciates in 2005

After a nominal depreciation in the course of 2004 until November 2004, the Turkish lira appreciated sharply against the euro in 2005. The nominal appreciation, which helped support disinflation, reached its peak at 1.61 TRL/EUR in December 2005. The TCMB has continued to dampen the speed of appreciation with frequent preannounced foreign exchange purchase auctions within the framework of its managed floating exchange rate regime. Thus, the ample capital inflows have allowed the TCMB to build up reserves in parallel to the currency appreciation.

Credit boom in housing involves inflation risks

The rehabilitation of the banks, reforms of financial regulation and supervision, the reduction of the public borrowing requirement (see below), lower real interest rates and the improvement of the overall economic situation have resulted in a large increase in bank credits to the private sector, mainly to households and for housing. If the current trend continues (and there is no indication that it will moderate soon), ongoing disinflation efforts may become more complicated.

<sup>7</sup> Turkey has started to produce the first macroeconomic data series according to ESA95. Attention needs to be given to further methodological development.

In 2005, the budget deficit turned out to be less pronounced than expected, which was basically attributable to more vigorous growth and declining interest rates. It has been confirmed that Turkey will meet the public sector primary surplus target of 6.5% of GNP according to the IMF definition also in 2006; however, Turkey will not fully deliver the structural improvements envisaged under the program agreed with the IMF. The overall fiscal balance, which recorded a deficit of 1.2% in ESA95 terms, benefited from declining risk premia and interest rates. The 2006 budget law envisages a narrowing of the consolidated budget deficit. In its assessment of the stabilization program, the IMF recommended deficit reduction and, furthermore, emphasized the need to push forward pension and health-care reforms. Reform measures in these areas were adopted in April 2006 and will be effective in 2007. They are part of a wider package to overhaul the country's social security system. The 2006 budget proposal has for the first time been drawn up in the context of a medium-term fiscal framework which extends the budget target through 2008.

**Fiscal position on track but structural improvements necessary**

The composition of the public debt stock improved in 2005; its external component remained stable (by comparison, private external debt increased substantially). At 49.3% of GDP, gross external debt remained constant at the end of 2005 despite the exchange rate appreciation, as the current account deficit widened. The sensitivity of external debt to exchange rate shocks is notable in light of the substantial cumulative nominal and, in particular, real appreciation of the lira in recent years. The lengthening of maturities has reduced rollover risk. However, continued reliance on floating rate paper implies an interest rate risk comparable to that of shorter-term paper. The composition of debt should improve further in 2006, as substantial amounts of foreign exchange-indexed debt will be retired.

In 2005, the current account deficit widened further, exclusively because of the worsening of the trade deficit in the wake of the deterioration of the terms of trade (rising oil prices) and the currency appreciation. However, import growth outstripped export growth less than earlier, moderating the dynamics of the deterioration. The slowdown of export growth is mainly due to the weakening of textile exports, which account for nearly a third of Turkey's exports, as a result of the expiration of the international Multifiber Arrangement. The decision to start accession negotiations with Turkey changed the markets' perception of the country's medium-term outlook and investment opportunities, and net FDI inflows started to take off in the second half of 2005 (privatization) and more than tripled in the year as a whole. Record capital inflows have facilitated the financing of the current account deficit, and increasing FDI inflows have started to improve their composition. Corporate tax cuts which will take effect in 2006 are expected to support FDI inflows further.

**Wider current account deficit financed mainly by FDI and portfolio inflows**

Table 12

Main Economic Indicators: Turkey								
	2002	2003	2004	2005	Q1 2005	Q2 2005	Q3 2005	Q4 2005
Year-on-year change of the period total in %								
GDP in constant prices	7.9	5.8	8.9	7.4	6.6	5.5	7.7	9.5
Private consumption	2.1	6.6	10.1	8.8	4.1	3.9	10.4	16.7
Public consumption	5.4	-2.5	0.5	2.4	4.5	4.0	3.2	0.0
Gross fixed capital formation	-1.1	10.0	32.4	24.0	10.3	20.0	30.7	33.0
Exports of goods and services	11.1	16.0	12.5	8.5	14.0	6.7	3.9	10.9
Imports of goods and services	15.8	27.1	24.7	11.5	10.6	9.1	11.2	15.3
Contribution to GDP growth in percentage points								
Domestic demand	8.8	8.8	13.6	7.5	4.9	6.3	8.1	10.0
Net exports	-0.9	-3.0	-4.6	-1.7	0.4	-1.8	-2.4	-2.3
Year-on-year change of the period average in %								
Labor productivity of industry (real)	8.5	7.1	7.5	6.0	5.1	4.3	6.1	8.4
Gross average wage of industry (nominal)	37.6	23.1	13.4	12.2	12.6	12.4	12.5	11.4
Unit labor cost of industry (nominal)	26.8	15.0	5.5	5.9	7.2	7.7	6.1	2.8
Producer price index (PPI) of industry	50.1	25.6	14.6	6.0	10.9	6.7	4.3	2.3
Consumer price index (here: HICP)	47.0	25.6	10.1	8.1	8.8	8.7	7.8	7.3
EUR per 1 TRY, + = TRY appreciation	-23.2	-15.4	-4.5	5.9	-4.4	2.3	10.4	16.0
Period average levels								
Unemployment rate (ILO definition, %, 15–64 years)	10.4	10.5	10.3	9.8	11.7	9.2	9.2	9.2
Employment rate (15–64 years)	44.7	43.5	43.6	43.9	41.3	44.8	44.8	44.8
Key interest rate per annum (%)	49.6	36.1	21.9	14.8	16.6	14.7	14.3	13.8
TRY per 1 EUR	1.4	1.7	1.8	1.7	1.7	1.7	1.6	1.6
Nominal year-on-year change of the period average stock in %								
Broad money (including foreign currency deposits)	43.1	16.5	24.1	20.6	18.9	20.5	21.1	21.6
Contributions to the year-on-year change of broad money in percentage points								
Net foreign assets of the banking system	-6.9	-1.8	2.2	6.4	5.1	5.3	7.2	7.7
Domestic credit of the banking system	55.9	24.8	28.7	20.5	21.7	21.8	20.6	18.3
of which:								
claims on the private sector	2.1	9.4	19.1	18.8	20.0	18.2	18.4	18.8
claims on households	0.1	3.1	8.0	8.7	8.2	8.2	8.7	9.4
claims on enterprises	2.0	6.3	11.1	10.2	11.8	10.0	9.7	9.4
claims on the public sector (net)	53.8	15.5	9.6	1.7	1.7	3.6	2.2	-0.5
Other domestic assets (net) of the banking system	-5.9	-6.5	-6.9	-6.3	-7.9	-6.6	-6.7	-4.5
% of GDP, ESA 95								
General government revenues	32.3	26.9	26.6	30.6				
General government expenditures	45.2	38.2	32.3	31.8				
General government balance	-12.9	-11.3	-5.7	-1.2				
Primary balance	7.1	5.9	5.9	8.0				
Gross public debt	93.1	85.1	76.9	69.6				
EUR million, period total								
Merchandise exports	42,392	45,192	53,913	61,843	13,689	15,154	15,530	17,470
Merchandise imports	49,980	57,449	73,102	88,289	18,440	21,871	23,301	24,677
% of GDP, period total								
Trade balance	-4.0	-5.7	-8.0	-9.1	-8.7	-10.5	-8.5	-8.7
Services balance	4.3	4.3	4.3	3.9	1.7	3.4	6.9	2.4
Income balance (factor services balance)	-2.5	-2.3	-1.9	-1.6	-2.0	-2.0	-1.2	-1.4
Current transfers	1.4	0.4	0.4	0.4	0.3	0.5	0.4	0.4
Current account balance	-0.9	-3.3	-5.2	-6.3	-8.7	-8.6	-2.4	-7.3
Capital account balance								
Foreign direct investment (net)	0.5	0.5	0.7	2.5	0.9	0.2	2.1	5.7
EUR million, end of period								
Gross external debt	124,159	114,823	119,111	144,157	124,091	134,828	138,539	144,157
Gross official reserves (excluding gold)	25,562	26,616	26,436	42,823	29,331	33,049	34,686	42,823
Months of imports of goods and services								
Gross official reserves (excluding gold)	5.4	5.0	3.9	5.3	4.3	4.1	4.0	4.7
Memorandum item								
EUR million, period total								
Gross domestic product in current prices	190,668	214,235	241,185	292,121	54,374	64,107	91,281	82,360

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiw, OeNB.

## 11 Russia: Oil Boom Continues

Pushed by buoyant internal demand (private consumption as well as investment) and despite the further weakening of net exports, Russian GDP growth remained robust in 2005 at more than 6%. In the course of the year, the economic expansion gathered momentum and reached almost 8% year on year in the fourth quarter, driven mostly by accelerating fixed capital formation. Higher investments have partly also spread outside the resource sector (e.g. to metallurgy, chemicals and construction), starting to fuel somewhat broader-based growth. At the same time, most of this diffusion of investments has been carried out by commodity-based conglomerates. And some sectors, notably resource extraction and transportation, seem to be struggling with capacity constraints. In the first two months of 2006, GDP growth is estimated to have slowed down to 4.1% (year on year). According to the Ministry of the Economy, the slowdown was triggered partly by the persistent real appreciation of the ruble, partly by this winter's exceptionally cold weather.

Continuing terms-of-trade gains featuring further oil and gas price rises in 2005 as well as prudent macroeconomic policies have sustained substantial and growing twin surpluses and have pushed foreign exchange reserves and the budgetary stabilization fund (established in 2004 to accumulate windfall oil-related revenues and thus to protect the budget from the effects of oil price-triggered economic volatility) to new record levels. The current account surplus was higher than in 2004; the general government budget surplus came to almost 8% of GDP of 2005. The size of the budget surplus was also caused by the tightening of resource taxation and the enforcement and collection of large back tax claims. According to preliminary estimates, in the first quarter of 2006 the current account surplus, measured in euro, increased by over a third compared to the corresponding period of the previous year. In January and February 2006, the federal fiscal surplus is estimated to have exceeded 11% of (pro rata) GDP. At end-March 2006, the foreign currency (including gold) reserves of the Central Bank of Russia (CBR) topped a new record level of EUR 170 billion (which corresponds to 15 months of goods and services imports), and the stabilization fund reached EUR 50 billion.

Although the stabilization fund is successfully used as the government's major sterilization instrument for liquidity created by the CBR's forex market interventions to prevent too strong a nominal appreciation of the ruble, the large and unabating inflows of foreign exchange proceeds keep the ruble under real appreciation pressures. The related problems include the specter of the Dutch disease, which continues to constitute the dilemma of Russian macroeconomic policy. Despite the rapidly rising levels of foreign exchange reserves and of the stabilization fund, the ruble's real-effective exchange rate climbed 15% from early 2005 to the end of March 2006 (compared to more than 30% since the beginning of 2003). Inflation has essentially not declined any more since early 2004 and stubbornly remains above 10%. This helps explain booming imports of manufactured goods (like automobiles or consumer electronics) and subdued industrial production growth, which came to 4% in 2005 and slowed to around 3% in the first quarter of 2006 (year on year).

High oil prices and buoyant internal demand keep Russian growth robust in 2005

Prudent fiscal policies contribute to substantial twin surpluses

Despite swift expansion of foreign exchange reserves and of the stabilization fund, real appreciation pressures persist and inflation exceeds 10%

**Structural reforms, apart from banking, have almost ground to a halt**

Despite these macroeconomic tensions and growing concerns about industrial competitiveness in the wake of real effective exchange rate developments, the authorities appear to be largely satisfied with the overall situation. This may explain why economic policymakers appear complacent and why structural reforms have almost ground to a halt in Russia. In the fall of 2005, the CBR closed the screening process for the inclusion of banks in the deposit insurance scheme, with the result that about 920 banks (about three-quarters of the total number) accounting for 99% of all private deposits were admitted to the scheme. This should raise general confidence in the banking sector and should level the playing field. Banking activity continued to expand rapidly in 2005, with banking deposits as well as credits increasing by a quarter in real terms; bank assets rose to about 45% of GDP at the end of the year. Austrian banks have also been playing an increasing role in Russia. In early February 2006, Raiffeisen International agreed to purchase Impexbank, a mid-sized privately owned bank, for around EUR 460 million.

**Growing total foreign debt**

Despite its expansion, the banking sector does not fully meet the financial needs of large resource-oriented Russian corporations, which are increasingly taking up funds abroad. As of early 2006, the stock of corporate sector foreign liabilities approached EUR 100 billion. Growing private external debt is responsible for the rise of Russia's total foreign debt (which came to 35.6 % of GDP at end-2005). The increase is tempered, however, by the timely and early retirement of foreign liabilities on the part of the state. As a result, the federal government's share in the country's total foreign debt has declined to about a third.

**Business climate remains challenging, growth remains fragile**

At end-March 2006, the CBR announced a step to liberalize capital account transactions consistent with the commitment to achieve this goal by early 2007: The remaining mandatory foreign currency selling requirements for exporters (10% of export proceeds) will be lifted and deposit requirements for nonresident portfolio investments will be halved on May 1, 2006. Notwithstanding the above-mentioned tendency toward some diversification of investment, the overall business climate remains challenging. Interventions of the tax and other authorities continue to be widespread, and the rule of law has not been fully established yet. The quality of Russian economic growth therefore remains fragile, and its sustainability beyond the current period of high commodity prices is still in question.

Cutoff date for data: April 27, 2006.

Table 13

## Main Economic Indicators: Russia

	2002	2003	2004	2005	Q1 2005	Q2 2005	Q3 2005	Q4 2005
Year-on-year change of the period total in %								
GDP in constant prices	4.8	7.4	7.2	6.4	5.0	5.7	6.6	7.9
Private consumption	8.3	7.4	11.2	10.9	8.5	12.1	11.5	11.1
Public consumption	2.6	2.2	2.0	1.8	1.4	2.0	1.9	1.9
Gross fixed capital formation	2.8	12.8	11.3	10.4	8.2	9.7	10.1	12.2
Exports of goods and services	10.3	12.5	11.8	6.3	3.5	5.6	5.1	10.3
Imports of goods and services	14.6	17.7	22.0	17.3	15.4	14.9	19.4	18.6
Contribution to GDP growth in percentage points								
Domestic demand	4.1	6.6	8.3	8.3	6.9	7.5	9.4	9.0
Net exports	0.4	0.4	-1.0	-2.3	-2.4	-1.8	-3.3	-1.6
Year-on-year change of the period average in %								
Labor productivity of industry (real)	7.5	13.9	13.4	..	-14.1	-14.3	-14.3	-14.0
Gross average wage of industry (nominal)	27.2	25.4	5.2	21.7	21.0	21.3	21.5	22.9
Unit labor cost of industry (nominal)	18.3	10.1	-7.3	..	41.0	41.6	41.7	42.9
Producer price index (PPI) of industry	11.7	15.6	24.0	20.7	23.3	23.3	20.6	16.2
Consumer price index (here: CPI)	16.0	13.6	11.0	12.5	12.9	13.4	12.5	11.2
EUR per 1 RUB, + = RUB appreciation	-11.9	-14.5	-3.1	1.7	-1.9	-1.5	2.5	8.1
Period average levels								
Unemployment rate (ILO definition)	8.0	8.6	8.2	7.6	8.2	7.4	7.2	7.5
Employment rate	..	..	..	..	..	..	..	..
Key interest rate per annum (%)	22.7	17.3	13.5	13.0	13.0	13.0	13.0	12.9
RUB per 1 EUR	29.6	34.7	35.8	35.2	36.5	35.4	34.8	34.2
Nominal year-on-year change of the period average stock in %								
Broad money (including foreign currency deposits)	31.2	39.2	35.5	33.9	31.5	30.8	35.8	36.8
Contributions to the year-on-year change of broad money in percentage points								
Net foreign assets of the banking system	19.8	21.3	22.4	34.0	33.5	36.0	34.2	32.4
Domestic credit of the banking system	30.4	29.6	17.6	0.4	1.4	-7.5	1.4	5.8
of which:								
claims on the private sector	28.9	29.5	30.8	30.0	30.1	27.4	29.8	32.6
claims on households	..	..	..	..	..	..	..	..
claims on enterprises	..	..	..	..	..	..	..	..
claims on the public sector (net)	1.5	0.2	-13.2	-29.6	-28.7	-34.9	-28.4	-26.8
Other domestic assets (net) of the banking system	-19.1	-11.7	-4.5	-0.2	-2.7	2.9	0.1	-1.3
% of GDP								
Federal government revenues	20.3	19.5	20.5	23.7				
Federal government expenditures	18.4	17.8	16.1	16.2				
Federal government balance	1.8	1.7	4.4	7.4				
Primary balance	3.9	3.4	5.6	8.4				
Gross public debt, general government	37.0	28.6	21.9	20.5 <sup>1</sup>				
EUR million, period total								
Merchandise exports	113,201	120,040	147,168	196,763	38,269	47,319	53,130	58,045
Merchandise imports	64,278	67,066	78,192	101,314	19,570	23,360	26,592	31,792
% of GDP, period total								
Trade balance	13.5	13.9	14.6	15.5	15.5	16.9	15.8	14.2
Services balance	-2.9	-2.5	-2.3	-1.9	-1.6	-1.8	-2.5	-1.7
Income balance (factor services balance)	-1.9	-3.0	-2.2	-2.4	-0.9	-2.5	-3.5	-2.3
Current transfers	-0.2	-0.1	-0.1	-0.2	-0.1	-0.0	-0.2	-0.3
Current account balance	8.5	8.2	9.9	11.0	12.8	12.6	9.6	9.9
Capital account balance	-3.5	-0.2	-0.3	-1.6	-0.1	-0.7	-5.3	-0.0
Foreign direct investment (net)	-0.0	-0.4	0.4	0.1	1.8	1.8	1.7	-3.7
EUR million, end of period								
Gross external debt	143,728	148,489	159,174	219,208	161,679	179,458	178,708	219,208
Gross official reserves (excluding gold)	42,291	58,531	88,661	148,094	103,142	122,727	129,169	148,094
Months of imports of goods and services								
Gross official reserves (excluding gold)	5.7	7.7	10.1	13.4	12.3	12.0	10.6	10.9
Memorandum item								
EUR million, period total								
Gross domestic product in current prices	363,558	381,607	473,181	615,679	120,460	142,069	168,287	184,862

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiiv, OeNB.

<sup>1</sup> End-September 2005.



SPECIAL FOCUS:  
THE MONETARY TRANSMISSION  
MECHANISM

# Monetary Transmission in Central and Eastern Europe: Gliding on a Wind of Change

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*This paper surveys recent advances in empirical studies of the monetary transmission mechanism (MTM), with special attention to Central and Eastern Europe (CEE). In particular, while laying out the functioning of the separate channels in the MTM, it explores possible interrelations between different channels through which they may amplify or attenuate each others' impact on prices and the real economy. The empirical findings for CEE are then briefly compared with results for industrialized countries, especially for the euro area. We highlight potential pitfalls in the literature and assess the relative importance, and potential development, of the different transmission channels, emphasizing the relevant asymmetries between Central and Eastern European countries (CEECs) and the euro area.*

## 1 Introduction

Given its potential to affect the real economy, monetary policy has been subject to intense academic scrutiny in the economics profession over the years. Bernanke and Gertler (1995) deem the mechanism through which monetary policy actions are transmitted to the real economy a black box. Interest in resolving this conundrum has produced a large body of theoretical literature and a plethora of empirical papers that seek to match theory with real data. The most traditional explanation for the link between monetary policy and the real economy is the interest rate channel developed in textbook IS-LM models. However, the early observation that the interest rate channel cannot neatly explain output fluctuations has given rise to credit channel literature (including the bank lending, the broad lending and the bank capital channels and the role of trade credit). Finally, asset prices, such as the exchange rate, stock and real estate prices, are also believed to constitute a bridge between nominal and real variables – a view which has had important policy implications for the choice of variables in a central bank's interest rate rule in inflation targeting. This paper analyzes the separate functioning of the distinct channels, but it also highlights possible interlinkages between the different channels through which they may magnify or counteract each others' influence in the monetary transmission mechanism (MTM).

There are at least two important reasons to study the MTM in the transition economies of Central and Eastern Europe (CEE). First, a genuine and precise understanding of how fast, and to what extent, a change in the central

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The authors would like to thank Markus Arpa, Peter Backé, Csilla Horváth, Zoltán M. Jakab, Markus Knell, Mihály M. Kovács, Márton Nagy, György Szapáry, Balázs Vonnák, the participants of seminars held at Magyar Nemzeti Bank, the OeNB, the Deutsche Bundesbank, at the "Finance and Consumption Conference: Credit, Consumption and the Macro Economy" held at the European University Institute, Florence, and at DG ECFIN (European Commission) and two anonymous referees for useful comments and remarks. We also wish to thank Rena Mühldorf for language advice. Part of this paper was written when Balázs Égert was visiting Magyar Nemzeti Bank in 2005.

bank's interest instrument modifies inflation lies at the heart of inflation targeting. An increasing number of transition countries are already making use of inflation targeting, have recently started to use it or are planning to do so. Second, given the forthcoming full euro area participation of the countries that entered the EU in May 2004 and given the large gap in financial sector development between CEE and the euro area, it is of fundamental importance to evaluate whether monetary transmission operates differently in the CEECs, whether a homogeneous approach to monetary policy for CEE and euro area countries could lead to sharply different effects on these economies and what kind of new challenges the ECB will be facing in this context.

Despite the importance of these questions, the empirical literature dealing with CEE appears to be fragmented in the sense that different aspects of the MTM are analyzed separately and that the big picture may be hidden behind the individual studies. This paper attempts to bring together different branches of the literature. In particular, we take stock of the empirical issues relating to CEE and present them systematically. In addition, we direct attention to potential pitfalls in the literature and assess the relative importance and the potential development of the different transmission channels.

The paper is structured as follows. Sections 2 to 5 survey the theoretical literature and summarize the empirical findings for the CEE transition economies for the interest rate channel, exchange rate channel, asset price channel and credit channel, respectively. Section 6 analyzes studies based on the vector autoregression (VAR) methodology. Section 7 concludes by speculating on possible future developments of the different channels.

## 2 The Interest Rate Channel and the Transmission Process

The interest rate channel encapsulated in the traditional IS-LM model can be dissected into two distinct stages: (1) the transmission from short-term nominal interest rates to long-term real interest rates, and (2) the channel through which aggregate demand and production are affected by real interest rate developments.

### 2.1 First Stage: Interest Rate Pass-Through

Crucial to the effectiveness of any monetary policy action is first, how changes in the monetary policy rate are transmitted onto market rates at the longer end of the maturity spectrum and second, how bank deposit and lending rates are affected by such a change in market rates.

The term structure of interest rates provides the connection between short- and long-term (market) nominal interest rates. The slope and the dynamics of the term structure can best be explained using a combination of standard theories, such as the liquidity preference view, according to which investors require a liquidity premium for holding less liquid (usually long-term) assets, or the market segmentation view, according to which short-term and long-term interest rates can be determined independently in segmented markets. More importantly, it is widely accepted that expectations are a key determinant of the shape of the yield curve. According to this view, long-term interest rates are obtained as an average of expected future short-term interest

rates. This is often referred to as the *expectation channel*, which also plays an important role in the asset price and exchange rate channels.

Another facet of transmission is how interest rate changes in the money and capital markets influence bank deposit and loan interest rates. We can illustrate the connection between market rates and bank lending using a marginal cost pricing model, where the price set by the bank ( $i^B$ ) equals the marginal cost of funding approximated by a market interest rate  $i^M$  and a constant markup  $\mu$  (De Bondt, 2002):

$$i^B = \mu + \beta \cdot i^M \quad (1)$$

The pass-through parameter is equal to 1 under perfect competition and complete information. However, full (or perfect or complete) pass-through may not prevail if markets are imperfect and information is asymmetric. In particular, the degree of pass-through crucially hinges on the presence of a unit interest rate elasticity of demand for both deposits and loans. Demand elasticities lower than one result in an incomplete pass-through ( $\beta < 1$ ), and a combination of factors may cause the demand elasticities to become less than unity. First, imperfect substitution between bank deposits and other investment facilities of the same maturity and flexibility (money market funds, T-bills and the like) and between bank lending and other types of external finance (equity or bond markets) reduces demand elasticities: a low degree of competition between banks, and between banks and nonbank financial intermediaries, lowers the sensitivity of demand for deposits and loans to the interest rate. Second, demand elasticities may be reduced if it is costly to change banks (switching costs). In addition, market segmentation due to switching costs and a high concentration of the banking sector can lead to a monopolistic market structure, preventing the pass-through from being unity.

The presence of asymmetric information (adverse selection and moral hazard) may render bank lending rates less responsive to changes in the key rate. At the same time, the interest rate pass-through to lending rates can exceed one (overshooting) in the event that banks charge higher interest rates in an attempt to counteract higher risks resulting from asymmetric information, rather than reducing the supply of loans (De Bondt, 2002).

If competition is weak, the interest rate pass-through may vary over the interest rate cycle. When interest rates are on the rise, banks may adjust their lending rates more quickly than their deposit rates. Conversely, if interest rates are falling, they may tend to decrease their deposit rates more rapidly than their lending rates (Hannan and Berger, 1992, and Weth, 2002). Sander and Kleimeier (2004a) stress that the degree of competition is more important for the pass-through for deposit rates than for lending rates, since problems related to asymmetric information are smaller for deposit rates.

Furthermore, the pass-through from the policy rate to retail rates may not only be incomplete in the long run, but could be sluggish in the short run due to an array of other factors: First, banks respond slowly to changes in market rates in the presence of adjustment or menu costs. They may decide to adjust lending rates less frequently than policy rates are changed, but when they do adjust, the movement is substantial. Second, the way in which banks adjust their lending rates depends on the maturity mismatch of their loan and deposit portfolio. The more long-run loans are covered by long-term deposits, the less

pressure banks feel to adjust their lending rates. In other words, it matters how responsive their liability side is to market rates. Banks with extensive recourse to long-run deposits such as saving deposits, which are not particularly affected by market rates, are slower to adjust their lending rates than banks whose liability side relies more heavily on deposits or other forms of financing, which are more sensitive to market rates (Weth, 2002).

Third, if banks have long-term relationships with their customers, they may want to smooth interest rate changes. This may apply to universal banks and the so-called “hausbank.”

Finally, macroeconomic conditions may also affect the pass-through. During periods of rapid economic growth, i.e. under favorable economic conditions, banks may find it easier to pass on changes in the interest rate to their lending and deposit rates more quickly. Higher inflation may also favor a more rapid interest rate pass-through, given that prices may be adjusted more frequently in a high-inflation than in a low-inflation regime. Increased uncertainty as reflected in higher interest rate volatility may, however, lower the interest rate pass-through, because banks may want to get a true picture of the underlying position.

Importantly, the pass-through to loan rates is intimately related to the credit market in general and to the functioning of the credit channel in particular. As we will argue later in the paper, disequilibrium in the credit market may either diminish the completeness of the pass-through or may help move toward full pass-through. A related issue is how easily banks can refinance themselves. Banks which have more difficulty accessing external financing because of asymmetric information problems – usually smaller banks – increase their deposit rates to attract more deposits and, consequently, also adjust their lending rates. By the same token, more liquid and more capitalized banks adapt their retail rates more slowly to changes in the monetary policy rate than less liquid banks with less capital (Gambacorta, 2004).

### 2.1.1 Empirical Issues and Results

There are three main strands in the literature relating to the choice of the explanatory interest rate variable. One strand tests how market interest rates are transmitted to retail bank interest rates of comparable maturity. This approach is termed the cost of funds approach (De Bondt, 2002). A second strand directly tests the impact on retail rates of changes in the interest rate controlled by monetary policy. Sander and Kleimeier (2004a) call this the monetary policy approach. In practice, the interest rate pass-through is usually investigated using an error correction model (ECM) including two interest rate series which may or may not include size or sign asymmetry. Size asymmetry occurs when the speed of adjustment to equilibrium depends on the size of the deviation: the higher the deviation from equilibrium the quicker the adjustment. Sign asymmetry occurs when the speed of adjustment differs depending on whether the deviation occurs above or below equilibrium or whether the policy rate declines or increases.

A third unifying approach includes two stages (see chart 1):

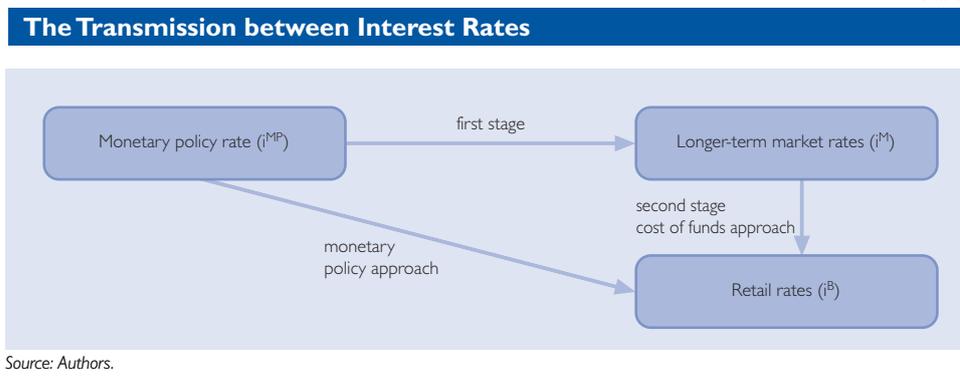
1. the pass-through from the monetary policy rate to market rates ( $i^{MP} \rightarrow i^M$ )
2. the transmission from market rates to retail rates ( $i^M \rightarrow i^B$ )

These two stages can be incorporated into an ECM representation as in equation (2) (Berstein and Fuentes, 2003, and De Bondt et al., 2003):

$$\Delta i_t^B = \alpha_0 + \rho(i_{t-1}^B - \mu - \beta i_{t-1}^M - \beta i_{t-1}^{MP}) + \sum_{j=0}^l \delta_j \Delta i_{t-j}^M + \sum_{j=0}^l \gamma_j \Delta i_{t-j}^{MP} + \sum_{j=1}^l \phi_j \Delta i_{t-j}^B + \varepsilon_t \quad (2)$$

However, the interpretation of a single-equation setting becomes difficult when the series are found to be cointegrated. In this kind of setup it is probably best to test separately for the existence of two potential cointegration relationships ( $i^{MP} \rightarrow i^M$ ;  $i^M \rightarrow i^B$ ) using the methods of Johansen.

Chart 1



One difficulty with the transmission between interest rates that deserves special mention is that the first stage of transmission between monetary policy rates and longer-term market rates, captured directly by the first stage of the unifying approach and indirectly by the monetary policy approach, inherently measures the term structure. As already noted, the term structure crucially hinges on how expectations are formed about future inflation and the reaction of monetary policy to inflation. Consequently, the term structure may change over time and may differ between countries. For a given country, changes in the term structure may indicate changes in inflation expectations or the progress of disinflation. Across countries, differences in the term structure may stem from the heterogeneity of views about the credibility of monetary policy or of weights/preferences given to fighting inflation (the tradeoff between inflation and output stabilization).

Table 1 summarizes the empirical studies carried out for transition economies. Although the country coverage for different segments of the interest rate pass-through is unbalanced and the quality of the data may be of some concern in some cases, some general conclusions can be drawn. First, it appears that the pass-through from the monetary policy key rate to short-term money market rates is very high or complete. The pass-through from money market rates to market interest rates of shorter maturity also turns out to be very high, whereas the pass-through to long-term market rates is unstable mainly because of the change in the yield curve that results from successful disinflationary

policies. This implies that the pass-through from the policy rate to retail rates occurs via short-term rather than via long-term market rates.

Most studies use the one-stage monetary policy approach to estimate the pass-through from market to retail interest rates. Three main results stand out, and they turn out to be similar to the findings for the euro area.

1. The most complete pass-through is typically found for short-term corporate lending rates followed by long-term corporate loan rates. The lowest average pass-through is observed for consumer loans.

The pass-through tends to be higher for the Baltic states and particularly low for the Czech Republic and Slovakia. For Hungary and Poland, the range is rather large. In general, the interest rate charged for new loans tends to react more strongly to market conditions in the long run than that charged for old loans. However, somewhat surprisingly, the opposite holds true for Romania.

2. The pass-through to deposit rates is less complete, with the average long-run pass-through coefficient amounting to 0.72 for short-term deposits and to 0.69 for long-term deposits. In particular, it appears that the remuneration of current accounts and saving accounts incorporates a very low fraction of changes in market rates. However, the pass-through of time deposits increases for higher maturities.

Another, and perhaps surprising, observation is that there is no systematic difference between the long-run pass-through for interest rates on household and corporate deposits for Hungary and Poland. By contrast, changes in market rates are transmitted much less to corporate than to household deposit rates in Estonia and Latvia.

3. There is substantial cross-country heterogeneity for the long-run pass-through.<sup>4</sup> Moreover, there is heterogeneity even for the same market in the same country.

Consider, for example, mortgage rates for Lithuania, where the pass-through is complete for one-year rates and is nearly zero for five-year rates. Sander and Kleimeier (2004b) provide some quantitative support for this view by regressing the estimated pass-through coefficients on country and market dummies (for loans and deposits). The country dummies turn out to be significant. The market dummies confirm that the pass-through for short-term and long-term loan rates is higher and their reaction is swifter, especially when compared to saving and current accounts. They also find that the long-run pass-through for corporate loans is quite homogeneous, even though there are differences in the speed of adjustment. Égert, Crespo-Cuaresma and Reiningger (2006) provide evidence of large heterogeneity across countries and market segments. They also show that a number of time series for which error correction models are estimated in the literature are not cointegrated. The regressions run for first-differenced data indicate lower pass-through coefficients.

<sup>4</sup> It is not always clear whether the interest rate series used under the heading “long-run interest rates” are fixed or variable rates for long-run loans or deposits. However, the results indicate how any given composition reacts to changes in the base or market rates.

A major difference between CEECs and the euro area countries is the weaker evidence in favor of asymmetry in the adjustment process. Sander and Kleimeier (2004b) conclude that the pass-through process exhibits less asymmetry in the transition economies. This statement is backed by results reported in Crespo-Cuaresma, Égert and Reininger (2004) and Chmielewski (2003). Nonetheless, Opiela (1999) finds some asymmetries for Polish bank level data from 1994 to 1998, and Horváth, Krekó and Naszódi (2004) for Hungarian deposit and loan rates for a more recent period. Égert, Crespo-Cuaresma and Reininger (2006) find an increase in asymmetry over time even though the share remains low and no clear pattern seems to emerge with regard to any specific country or interest rate series.

Another interesting finding on the pass-through in CEE is that both the contemporaneous and long-run pass-through increase over time, while the mean adjustment lag to full pass-through decreases as more recent data become available (Crespo-Cuaresma, Égert and Reininger, 2004; Horváth, Krekó and Naszódi, 2004; Sander and Kleimeier, 2004b).<sup>5</sup> However, Égert, Crespo-Cuaresma and Reininger (2006) show that the pass-through has been slowing down in the CEE-5<sup>6</sup> in the past few years.

Table 1

### Long-Run Interest Rate Pass-Through Estimates for CEE

Rate	Average long-run pass-through
Base rate => money market rate	1.01
Short-term deposit rate	0.72
Long-term deposit rate	0.69
Short-term lending rate	1.01
Long-term lending rate	0.91
Consumer lending rate	0.51
Housing/mortgage lending rate	0.73
Government security yields	0.92

Source: Authors' calculations.

Note: Averages are obtained using estimates reported in Árvai (1998), Crespo-Cuaresma, Égert and Reininger (2004), Horváth, Krekó and Naszódi (2004), Nickisch (2005), Sander and Kleimeier (2004b), Tieman (2004), Várhegyi (2003) and Wróbel and Pawlowska (2002).

### 2.1.2 Main Determinants of the Interest Rate Pass-Through in CEE

A number of researchers have attempted to analyze the factor, or factors, which may lie behind the size and speed of the interest rate pass-through. They have taken three approaches: The first consists of estimating a time series pass-through equation by including variables like market concentration (as a measure for competition). For example, Wróbel and Pawlowska (2002) introduce a monthly indicator measuring market concentration for deposits and loans (Herfindahl-Hirschman index)<sup>7</sup> in Poland and show that an increase in concen-

<sup>5</sup> Világi and Vincze (1998) report very sluggish short-run adjustment and a very low (0.1) long-run pass-through from 30-day and 90-day treasury bill rates toward rates on new corporate loans and short-term corporate deposits for Hungary between 1991 and 1994.

<sup>6</sup> The Czech Republic, Hungary, Poland, Slovakia and Slovenia.

<sup>7</sup> Alternatively, market concentration could also be measured as the share of the three or five biggest banks in terms of loans or deposits in total loans or deposits.

tration reduces the pass-through for lending rates (as expected), but increases it for deposit rates. Kot (2004) employs a different measure for competition. He argues that if competition is strong (that is, banks are price-takers), the interest rate elasticity of the demand for products of individual banks ( $\varepsilon_i^{ID}$ ) is much larger than the interest rate elasticity of aggregate demand for bank products ( $\varepsilon_i^{AD}$ ). Hence, ( $\varepsilon_i^{ID} > \varepsilon_i^{AD}$ ). Conversely, if banks have market power and can therefore influence interest rates, the interest rate elasticity at the individual and at the aggregate level will be closer to one another. The empirical assessment of the elasticities shows that consumer credit markets are more competitive in Hungary and in Poland than those in the euro area and that the degree of competition is the lowest in the Czech Republic. The connection between competition and pass-through is not particularly strong, given that the interest rate pass-through for consumer credits in Hungary and Poland is comparable to that in the euro area, despite harsher competition, while it is lower in the Czech Republic.

A second group of papers exploits the cross-sectional dimension of the data by first estimating pass-through coefficients using time series for an array of countries and markets and by then regressing the coefficients on a number of explanatory variables, such as macroeconomic variables and variables related to the structure of the financial sector. Sander and Kleimeier (2004b) adopt this approach. Their results indicate that of the macroeconomic variables, GDP growth and financial depth do not affect the speed and the size of the pass-through, while higher inflation is associated with a more pronounced pass-through and money market volatility decreases the pass-through.<sup>8</sup> Of the variables measuring the structural features of the financial sectors, a lower degree of concentration, fewer bad loans (a healthier banking sector) and more foreign participation tend to be associated with a higher and faster pass-through. This result holds for loans as well as for deposits.

The above approach can be extended to bank-level data. In such a setting, pass-through coefficients are estimated for individual banks and in the second stage are regressed on bank-specific features. Opiela (1999) uses this option and shows that for the period from 1994 to 1998, the pass-through of 37 Polish banks depends on ownership (involvement of the state), the share of bad loans and the degree of capitalization. In particular, he demonstrates that interest rates of state-owned banks respond strongly when key interest rates fall; as these are banks loaded with bad loans, they pass on changes in market conditions to retail interest rates more quickly during periods of rising interest rates.

A third way of proceeding involves combining time series and the cross-sectional dimension of bank-level data. More precisely, the reaction of the interest rates of individual banks to monetary policy steps and how these steps interact with bank-specific characteristics are investigated in a panel setting.

Horváth et al. (2004) investigate whether the interest rate pass-through is heterogeneous for 25 Hungarian banks and find that it was homogeneous for corporate loan and deposit rates for the period from 2001 to 2004. Várhegyi

<sup>8</sup> This contrasts with Horváth, Krekó and Naszódi (2004), who find that higher money market volatility increases the speed of adjustment.

(2003) examines the interest rate pass-through from money market rates to household deposit rates for a similar data set (11 Hungarian banks) and sample period (2000 to 2003). While the pass-through is incomplete in the long run for all banks, some heterogeneity is uncovered for individual banks.

Chmielewski (2003) goes a step beyond studying the pass-through at the bank level and estimates it for two groups of Polish banks as a function of whether they are good or bad in terms of (1) the share of classified loans, (2) the capital adequacy ratio, and (3) profitability captured by the return on assets. Perhaps, not surprisingly, more profitable banks adjust household deposit rates for longer maturities and for corporate loan rates faster than less profitable banks. Also, banks with more bad loans are quicker in adjusting their lending rates and slower in doing so for deposit rates. Finally, better capitalized banks turn out to react less quickly to market conditions than less capitalized banks.

To summarize, higher concentration of the banking sector, higher profitability and higher capitalization of banks typically make banks less receptive to adjusting their retail rates to market or policy rates, and hence dampen the interest rate pass-through. However, this general finding is in conflict with the result that the ownership structure, especially the involvement of foreigners in the banking sector, may enhance the interest rate pass-through, given that more foreign participation leads to higher concentration and that foreign-owned banks tend to be more profitable and better capitalized.

## 2.2 Second Stage: The Monetary Channel

While the first stage of monetary transmission concerns interest rate interactions, the second stage relates to the impact of nominal interest rate changes on the real sector. Price stickiness and rational expectations ensure that an innovation in short-term nominal interest rates will lead to moves in both short-term and long-term real interest rates. Given that real interest rate movements reflect changes in the cost of capital and corporate investment, spending will be affected. Like investment decisions, spending on housing and durable goods is sensitive to real interest rates. Of course, changes in interest rates entail two conflicting effects. A rise in interest rates increases the income of holders of interest-bearing assets (*income effect*), which can be offset by higher interest rates favoring savings instead of consumption (*substitution effect*). Changes in investment, housing and durable goods spending, i.e. aggregate demand, will eventually cause changes in output.

A few recent empirical studies investigate this issue. One of them is Chatelain et al. (2001), who estimate the sensitivity of manufacturing firms' investment demand to changes in the user cost of capital (and in sales and cash flow). The empirical evidence based on large micro-panels indicates that investment demand in France, Germany, Italy and Spain is sensitive to the user cost of capital. This proves that the money channel is at work in these countries. Similar results are reported in Kátay and Wolf (2004) for the case of Hungary. Kiss and Vadas (2005) investigate the Hungarian mortgage market and show that changes in mortgage interest rates have only a limited influence on disposable income (income effect), mainly because of institutional factors (the

government subsidy scheme and the domination of fixed noncallable mortgages).

### 3 Exchange Rate Channel

Beside interest rates and asset prices, both nominal and real exchange rates play a prominent role in the MTM. Monetary policy is able to bring about changes in the level of the exchange rate and thus to provoke changes in (1) prices, (2) trade volumes and (3) investment.

#### 3.1 Monetary Policy Actions and the Exchange Rate

##### 3.1.1 Short-Term Interest Rates and the Exchange Rate

An increasing number of papers have used the VAR methodology to study the impact of monetary policy innovations on the most important macroeconomic variables. These papers are surveyed in more detail below; they also address the impact of shocks in short-term interest rates on the nominal exchange rate and produce mixed results, since positive interest rate shocks can lead to an appreciation or depreciation of the exchange rate. The latter phenomenon is usually referred to as the exchange rate puzzle, which under special circumstances can be attributed to the unsuccessful defense of a given exchange rate level.

Relying on a different methodological framework, Rezessy (2004) shows that for Hungary changes in the key policy rate led to systematic changes in the exchange rate. He reports the absence of an exchange rate puzzle, since a rise in the policy rate causes the exchange rate to appreciate.

##### 3.1.2 Central Bank Intervention in the Foreign Exchange Market

In addition to changes in the short-term interest rate, monetary authorities may also influence short-run exchange rate movements by directly intervening on the foreign exchange markets. Although it is widely acknowledged that unsterilized intervention affects the exchange rate by altering relative money supply, the empirical evidence about the effectiveness of sterilized intervention, which may work through the portfolio, the signaling and the microstructure (or coordination) channels, is fairly mixed.

The view that foreign exchange intervention may be more effective in emerging market economies than in well-established industrialized countries is gaining acceptance; the main arguments supporting this view are that in emerging markets (1) central bank interventions are not always fully sterilized, (2) the size of interventions is large relative to market turnover in narrow foreign exchange markets, (3) market organization and the regulatory framework may be more conducive to interventions, (4) moral suasion may play a bigger role, and (5) central banks have a greater informational advantage over market participants (Canales-Kriljenko, 2003).

Only a few papers study the effectiveness of foreign exchange intervention in transition economies using daily data.<sup>9</sup> Disyatat and Galati (2005) could not find any significant impact of daily foreign exchange interventions on the

<sup>9</sup> The BIS (2005) provides a collection of foreign exchange intervention practices in the Czech Republic, Hungary, Poland and a large number of emerging market economies.

exchange rate of the Czech koruna using daily data from 2001 to 2002. By contrast, they find that interventions tend to increase foreign exchange volatility.

However, Holub (2004) applies an event study approach to monthly data and shows that intervention tends to be effective and, on a number of occasions, consistent with inflation targeting. Also relying on the event study approach – but applying it to daily data and completing it with Generalized Autoregressive Conditional Heteroscedasticity (GARCH) estimations – Égert and Komarek (2005) provide some additional supportive evidence in favor of the fact that foreign exchange intervention slowed down the appreciation of the Czech koruna from 1999 to 2002, especially when foreign exchange interventions were supported by interest rate policy in a consistent manner.<sup>10</sup> Finally, Égert and Lang (2005) also reveal that although the Croatian central bank was not particularly successful in influencing the exchange rate during the late 1990s in Croatia, official foreign exchange intervention was fairly effective in turning the trend on the foreign exchange markets from 2000 to 2004.

### 3.2 Exchange Rates and Prices

Nominal exchange rate movements caused by monetary policy action have the potential<sup>11</sup> to be translated into domestic inflation on the grounds of a modification of imported final goods prices, and because an alteration in the price of imported intermediate goods puts downward or upward pressure on domestic inflation via the price of domestically manufactured tradable and nontradable goods.

How the exchange rate affects domestic prices via imported prices in the end depends crucially on the pricing behavior of importing firms. If prices are set in the importer's currency (producer currency pricing – PCP), any change in the exchange rate will be automatically transmitted to the prices of the destination country. This implies a complete exchange rate pass-through, which is sometimes also referred to as Grassman's law; it also implies the validity of the law of one price, since the real exchange rate remains stable.<sup>12</sup>

Alternatively, if the price of imported goods is fixed in the local currency (local or consumer currency pricing – LCP), exchange rate movements are not reflected in domestic prices and the pass-through is zero. As a consequence, the real exchange rate may drift away from the level given by the law of one price and is correlated with the nominal exchange rate.<sup>13</sup> Importing firms practicing LCP will alter their markup in response to changes in the exchange

<sup>10</sup> The conflicting results obtained by Disyatat and Galati (2005) on the one hand, and Holub (2004) and Égert and Komarek (2005) on the other hand, might be due to the omission of macroeconomic news from the event study approaches. However, weak instruments may also have caused the failure of Disyatat and Galati (2005) to find that foreign exchange interventions are not successful. Their estimation results obtained from 2001 to 2002 may be considerably weakened by the fact that only three observations for foreign exchange intervention are available for 2001.

<sup>11</sup> The word potential has to be underlined here, as a great deal of factors aside from monetary policy have the ability to cause the exchange rate to change. As a result, the pass-through of the exchange rate to prices is only partly attributable to monetary policy action.

<sup>12</sup> Another implication is that a change in the relative price of imported and domestic goods will shift consumption from one type of good to the other (expenditure switching).

<sup>13</sup> This is indeed a well-documented fact for industrialized countries (see MacDonald, 2005).

rate, while those engaging in PCP usually adjust their output and labor in response to changes in local prices.

### 3.2.1 Differing Pass-Through for Imported, Producer and Consumer Prices

A typical finding of the empirical literature for imported goods prices in industrialized countries is that the pass-through lies between 0 and 1, which disqualifies both LCP and PCP (Campa and Goldberg, 2002).<sup>14</sup> The incomplete pass-through to import prices may be due to third-degree price discrimination, eventually preventing a complete pass-through even for homogeneous imported goods.

However, even if we assume perfect pass-through for imported goods, the vast literature dealing with the exchange rate pass-through usually pins down the following hierarchy across prices: The pass-through is highest for imported goods, lower for producer goods and lowest for consumer prices. Although this is not surprising at first glance for purely domestically produced goods and services (without any imported intermediate input), there are two ways of looking at the pass-through result:

1. One strand of the literature emphasizes the role of distribution costs for final imported goods. As imported goods reach consumers through wholesaling and retailing networks (including transportation, marketing and advertisement), their prices have a substantial local input, which serves as a buffer to soften the impact of exchange rate changes. Burstein, Eichenbaum and Rebelo (2002, 2004), for example, show that large devaluations of the home currency are not reflected in inflation of corresponding size because of the distribution sector and because consumers switch from imported goods to lower-quality – and hence cheaper – local brands (flight from quality). Analogously, large appreciations may not necessarily yield lower inflation if there is a flight to quality.
2. Other researchers emphasize the role of intermediate imported goods by assuming that imported goods are intermediate goods to which PCP applies (that is, the pass-through is complete). The price of final goods, which is a combination of the price of imported intermediate goods and of local goods, is set in local currency (Engel, 2002).<sup>15</sup> The pass-through would be higher than zero but sluggish in the event that prices in local currency are adjusted periodically (due to sticky prices) when exchange rate movements could also be incorporated.

### 3.2.2 A Slowdown of the Pass-Through to Prices over Time

Another important finding in the literature is that the exchange rate pass-through is higher for developing countries and that it declines over time both for industrialized and for developing countries.<sup>16</sup> Two explanations for this observation are put forth in the literature. The first one relates to the role of macroeconomic variables, especially inflation. The second option considers

<sup>14</sup> Choudhry et al. (2005) find that the theoretical model that best fits the data is the one that incorporates sticky prices and wages, distribution costs and a combination of LCP and PCP.

<sup>15</sup> In this sense, there is an expenditure switching for the producer and not for the consumer.

<sup>16</sup> Campa and Goldberg (2002) argue that a decline in the exchange rate pass-through can be observed only for half of the OECD countries.

the shift in imports from goods with higher pass-through elasticities to goods with lower ones.

1. The role of the macroeconomic environment.

Taylor (2000) conjectured that the slowdown in the pass-through (and the difference between developing and industrialized countries) is due to changes in the macroeconomic environment, in particular in the level and variability of inflation rates. This proposition has been extensively tested in a two-stage approach similar to that used for the investigation of the determinants of the interest rate pass-through.<sup>17</sup> Devereux and Yetman (2003), Choudhri and Hakura (2001) and Ca'Zorzi, Hahn and Sanchez (2005) rely on a two-stage approach for a large number of countries to show that high inflation is conducive to perfect pass-through and is often associated with complete pass-through. Bailliu and Fujii (2004) use a panel setting in which changes in inflation rates are controlled for by means of dummy variables. In contrast to the earlier literature, it turns out that the pass-through declined for import, producer and consumer prices for a set of 11 OECD countries during the 1990s. Gagnon and Ihrig (2001), and especially Soto and Selaive (2003), claim that inflation variability is more important than the level of inflation. In addition, Soto and Selaive (2003) also find openness and country size to be important factors in determining the pass-through. The higher the openness and the smaller a country is,<sup>18</sup> they argue, the higher the pass-through is.

2. The composition of trade and imports.

Even though Campa and Goldberg (2002) confirm the importance of inflation, and of exchange rate volatility,<sup>19</sup> they emphasize that the macroeconomic factors are dominated in the long run by what they call the “composition effect.” As the pass-through is nearly complete for energy and raw materials and is considerably lower than unity for food and manufactured products, a shift in the composition of imports from raw materials to manufactured goods, the argument goes, induces a decline in the exchange rate pass-through for imported goods. The econometric tests support this idea for a sample of OECD countries. This kind of reasoning could be applied to explain why the pass-through is higher for developing countries (which import more high-pass-through goods) than for developed countries (which import more low-pass-through goods).

Frankel, Parsley and Wei (2005) study the pass-through to prices of individual goods<sup>20</sup> for a large set of countries. In general, it turns out that the pass-through is not complete for import prices at the dock. Also, the pass-through to import prices in the U.S.A. is found to be considerably lower than in other developed economies. Given the high disaggregation of the data, the composition effect cannot be at the root of this phenomenon, which detracts from the Campa and

<sup>17</sup> First, country-specific exchange rate pass-through coefficients are estimated. Second, the estimated coefficients are regressed on a number of candidate explanatory variables.

<sup>18</sup> They measure openness in three alternative ways: (1) imports to GDP, (2) import duties as a share of imports, and (3) tariff rates on intermediate and capital goods.

<sup>19</sup> Note that Soto and Selaive (2003) cannot find evidence, for a larger sample, of exchange rate volatility as a driving force behind exchange rate pass-through.

<sup>20</sup> Marlboro cigarettes, Coca-Cola, cognac, Gilbey's gin, Time magazine, Kodak color film, Cointreau liqueur and Martini & Rossi vermouth.

Goldberg argument. However, they also find that the pass-through to import prices increased over time, while it decreased for the retail and CPI level for developing countries (but not for developed ones).

Finally, expectations about the extent of the pass-through and the transitory or permanent nature of the change in the exchange rate are at the heart of the pass-through process. While changes perceived as transitory will not affect prices, those regarded as permanent will impact on prices. The literature does not in general deal with the role of the exchange rate regime, although the pass-through is thought to be higher for countries where the exchange rate serves as a nominal anchor to inflationary expectations. In these countries, any change in the exchange rate will be rapidly incorporated into expectations and thus into prices (both tradable and nontradable). In contrast, if the exchange rate is not used as an intermediary target, expectations are not that strongly associated with the exchange rate, resulting in a lower pass-through. In a floating regime, exchange rate changes will have little influence on nontradable prices.

### 3.3 Exchange Rate Pass-Through in Transition Economies

A common practice in the literature is to estimate the exchange rate pass-through either relying on (recursive) VAR models devised by McCarthy (1999) or using a single equation approach that incorporates differenced variables (Campa and Goldberg, 2002) or that employs single equations in which the deviation from the long-run equilibrium exchange rate is modeled (Frankel, Parsley and Wei, 2005). Evidently, the exchange rate pass-through is intimately related to equilibrium exchange rates and to real misalignments. Both the VAR approach and the single-equation approach largely ignore this issue, which may mean that there is an omitted variable bias which could have serious implications for the estimated pass-through. For industrialized countries, this means that large nonequilibrium deviations from PPP should be accounted for when analyzing the exchange rate pass-through (Frankel, Parsley and Wei, 2005). The issue is possibly even more important for transition countries because their equilibrium exchange rates exhibit large changes, in particular a strong trend appreciation during the phase of economic transformation.<sup>21</sup> Hence, the trending movement of the equilibrium exchange rate and the deviation of the real exchange rate from this trend should be clearly considered for the study of the pass-through. Darvas (2001) stands out from the rest of the literature in that it models the equilibrium exchange rate and the degree of exchange rate pass-through jointly. In particular, the author first estimates the equilibrium exchange rate using the single-equation Behavioral Equilibrium Exchange Rate (BEER) approach. Next, prices and the nominal exchange rate are estimated using the following system:

$$\Delta p_t = \alpha + \beta \Delta e_t + \chi \Delta p_t^* + \delta (q_{t-1} - q_{t-1}^{EQ}) + \varepsilon_t \quad (3)$$

$$\Delta e_t = \gamma + \eta (q_{t-1} - q_{t-1}^{EQ}) + \varepsilon_t \quad (4)$$

<sup>21</sup> For an overview of this issue, see e.g. Égert, Halpern and MacDonald (2006).

where  $(q_{t-1}q_{t-1}^{EQ})$  measures the misalignment of the real exchange rate. In this setting,  $\beta$  represents the instantaneous long-run pass-through. Moreover, Darvas (2001) allows for time-varying parameters in his specification, given that the pass-through may (and, according to his results, does) change over time.

Notwithstanding the substantial shortcomings on the estimation side,<sup>22</sup> the average exchange rate pass-through reported in the row “Average” of table 2 reveals the incomplete nature of the pass-through from the exchange rate to prices, not only in the short run but also at a longer horizon. Table 2 also shows the term structure of the pass-through, which turns out to be highest for import prices with an average pass-through of 62%. A 1% change in the exchange rate results in an average 0.52% change in producer prices. Finally, as expected, the overall impact is the lowest on the CPI.

A first obvious specific observation is the large heterogeneity across countries regarding the pass-through to the CPI. CPI inflation is least affected by the exchange rate in the Czech Republic and is highest in Slovenia (53%) and Bulgaria (68%). The pass-through is also below the sample average for Romania (for the U.S. dollar).

In addition, two tentative observations can be made. The pass-through to the CPI tends to be higher for countries at a lower stage of development (Korhonen and Wachtel, 2005). Also, we can observe a larger pass-through for countries with an accommodative monetary policy at some stage (Slovenia and Romania). If a country operates an explicit or implicit crawling peg exchange rate regime, the preannounced devaluation of the currency provides a nominal anchor for expectations. As changes in the exchange rate may signal changes in prices, they will generate corresponding changes in prices not only for tradables but also for nontradables via the expectation channel. This would imply a high and quite homogeneous pass-through for the whole CPI. The move toward more exchange rate flexibility, coupled with an inflation targeting framework, may break the link between the exchange rate and prices by disconnecting primarily nontradables from the exchange rate (Coricelli, Jacbec and Masten, 2003; Darvas, 2001; Kara et al., 2005).

However, studies focusing on one country sometimes strongly disagree regarding the size of the pass-through. One prominent example is Estonia: While Dabušinskas (2003) finds a zero pass-through to the CPI,<sup>23</sup> Bitans (2004) reports an average pass-through of 53%.

Second, for the Russian case Dobrynskaya and Levando (2005) identify a higher pass-through to food and goods prices (around 50% and 30% in the long run) and virtually no pass-through to services. The finding for food is broadly in line with Dabušinskas (2003) for Estonia. However, somewhat oddly, there is no pass-through for goods in the Estonian CPI.

<sup>22</sup> Another cautionary note is in order: Some authors use sample periods going back to well before economic transition started in 1990. Campa and Goldberg (2002), Choudhri and Hakura (2001) and Soto and Selaive (2003) employ data going back to the 1970s, while the sample period starts in 1988 for Hungary in Ca’Zorzi, Hahn and Sanchez (2005).

<sup>23</sup> Given that the nominal exchange rate is fixed vis-à-vis the euro in the currency board arrangement, the pass-through measures how changes in the nominal effective exchange rate are translated into inflation.

Mihaljek and Klau (2001) claim that using a measure of CPI gleaned from nonmarket prices, such as administered and regulated prices, increases the long-run pass-through. Comparing their estimates for the Czech Republic, Hungary and Poland with the rest of the sample verifies this assumption. Along these lines, it turns out that the pass-through is biased downward by roughly 10% for Latvia when the price measure includes nonmarket prices (Bitans, 2004).

The exchange rate pass-through is found to be higher for the producer price index (PPI) than for the CPI for all countries except Croatia and Russia. Even for the Czech Republic, which has the lowest pass-through to the CPI, roughly 40% of exchange rate changes are passed on to producer prices. For the remaining countries, the pass-through to the PPI is usually above 50%. It is also more convenient to take the market-based component of the PPI. While no pass-through could be found on the basis of the overall PPI for Estonia, the PPI for manufacturing (net e.g. of energy, mining prices) reflects a large amount of changes in the effective exchange rate. Overall, the producer prices of manufactured goods, in particular machinery and equipment, are more receptive to changes in the exchange rate than other items are.

The pass-through to the price of imported goods is nearly complete in Estonia, Hungary and Poland and complete in Slovakia, while it is below the pass-through to the PPI for Latvia, Lithuania and Slovenia. Although a similar degree of heterogeneity can be found for subgroups of imported goods, the pass-through is highest in machinery, followed by other manufactured and chemical goods.

Third, the pass-through appears to be larger against the anchor or reference currency. This point is clearly demonstrated for Romania (Gueorguiev, 2003; Korhonen and Wachtel, 2005), where the pass-through is about twice as large against the U.S. dollar as against the euro. Inversely, changes in the U.S. dollar exchange rate matter little for prices in the Czech Republic and Hungary, for instance.

Finally, and overall, although the pass-through may have increased up to the mid- or late 1990s (Campa and Goldberg, 2002), it seems to have been falling since then, as convincingly evidenced by Bitans (2004), who argues that this finding is closely related to the decline in inflation rates. An interesting finding is that the pass-through for manufactured goods tends to be higher than for raw materials both for import and producer prices (Rodzko, 2004). This could invalidate the composition effect put forth by Campa and Goldberg (2002).<sup>24</sup>

<sup>24</sup> A criticism of the above work lies in its failure to address possible asymmetries in the pass-through. The pass-through could be different depending on whether the exchange rate depreciates, appreciates or does neither, whether changes in the exchange rate exceed a certain threshold (i. e. are large enough) or how much the exchange rate deviates from its equilibrium level. The exploration of these issues awaits future research.

Table 2

Summary of the Exchange Rate Pass-Through in Transition Economies						
	Import prices		PPI		CPI	
	Short-run	Long-run	Short-run	Long-run	Short-run	Long-run
<b>Average of the sample</b>						
Average	0.44	0.7	0.16	0.52	0.31	0.33
<b>Country-specific averages</b>						
<b>CEE-5</b>						
Czech Republic	0.34	0.65	..	0.41	0.10	0.23
Hungary	0.58	0.87	..	0.57	0.38	0.30
Poland	0.57	0.84	..	0.60	..	0.31
Slovakia	0.41	1.01	..	0.73	..	0.35
Slovenia	0.26	0.40	..	0.78	0.2	0.53
<b>Baltic-3</b>						
Estonia	0.59	0.83	..	0.47	0	0.35
Latvia	0.43	0.45	..	0.66	..	0.39
Lithuania	0.22	0.32	..	0.55	0.07	0.32
<b>SEE</b>						
Bulgaria	..	..	..	0.94	..	0.68
Croatia	..	..	..	0.17	..	0.22
Romania (EFF/EUR)	..	..	0.22	0.48	0.06	0.21
Romania (USD)	..	..	0.23	0.53	0.28	0.42
<b>CIS</b>						
Russia	..	..	0.11	0.23	0.42	0.40
Ukraine	..	..	..	..	..	0.44

Source: Authors' calculations.

Note: The averages are based on nonnegative pass-through estimates. Negative pass-through estimates were set to zero. The average of country-specific averages does not equal the figure given in the row "Average," as the sample specific average is obtained as the average of all available pass-through estimates. EFF (effective exchange rate), EUR and USD indicate the pass-through from the effective exchange rate and from the euro and U.S. dollar exchange rates, respectively. "." indicates that coefficient estimates are not available.

### 3.4 The Impact of the Exchange Rate on Trade and Investment

As regards trade flows, an appreciation (depreciation) of the exchange rate is thought to penalize (promote) exports and increase (decrease) imports, leading to a deteriorating (improving) trade balance. However, this holds true only if the Marshall-Lerner condition is verified and the sum of the price elasticities of export and import demand is higher than unity. The functioning of the Marshall-Lerner condition is also based on full pass-through to import prices (in local currency) and zero pass-through to export prices (in foreign currency). Hence, the failure of complete pass-through implies that the Marshall-Lerner condition need not apply.

Burstein, Neves and Rebelo (2004) document the fact that the import content of investment is significantly higher than the import content of consumption. As a result, the pass-through to investment prices is potentially higher than that to the price of consumer goods. However, the pass-through is also incomplete because of the nontradable component of investment. The bulk of the nontradable component in investment is due to construction services, while the share of distribution services is negligible.

Campa and Goldberg (1995) postulate that the impact of the exchange rate on sectoral investment depends on the export share and the import content of production of the sector. More specifically, exchange rate depreciation (appreciation) expands (decreases) investment if the export share is high. A high import content of sectoral production works in the opposite direction. Fur-

thermore, high markup sectors tend not to respond to exchange rate movements in investment demand, whereas low markup sectors respond more strongly to changes in the exchange rate.

We can draw a connection here between the *exchange rate channel* and the *credit channel*. The effect of the credit channel (see below) on the economic activity of firms constrained by external finance is exacerbated if these firms are in low markup sectors. The second relation linking the exchange rate channel and the credit channel is the influence of exchange rate movements on foreign currency-denominated assets and liabilities in firms' balance sheet and thus on their net wealth. If changes in the exchange rate impact significantly on firms' balance sheet, they will influence these firms' capacity to borrow externally (broad lending channel). A collapse in investment due to an exchange rate-induced fall in firms' net wealth may outweigh competitiveness gains, provided the Marshall-Lerner condition is verified (Carranza, Galdón-Sánchez and Gómez-Biscarri, 2004).

It is worth mentioning that not only the level but also the variability of the exchange rate is an important factor for trade and investment. Although the relationship between exchange rate volatility and aggregate or bilateral export flows seems to be ambiguous for developed countries, differentiating between sectors suggests a negative relationship between exchange rate volatility and export flows. Hence, the higher the exchange rate volatility is, the more trade is penalized, and consequently the more investment is affected. Nonetheless, the impact of volatility differs both in magnitude and direction across sectors. For developing countries, the literature unanimously supports the hypothesis that exchange rate volatility has a negative effect on exports flows (for an overview, see e.g. McKenzie, 1999).

Égert and Morales-Zumaquero (2005) studied the influence of exchange rate volatility on exports for a number of CEE countries. On the basis of standard export equations, augmented with foreign direct investment (FDI), the panel estimations indicate that a rise in foreign exchange volatility, measured either directly or via changes in the exchange rate regime, hinders exports and that this negative impact is transmitted with some delay rather than instantaneously. It turns out that the sectors which account for up to 80% of exports, such as chemicals and different types of manufacturing, suffer most from an increased exchange rate volatility. Nevertheless, country-specific time series estimations reveal a great deal of heterogeneity across countries. For instance, there is little or weak evidence in favor of a negative relation between foreign exchange volatility and exports in Slovenia, Russia and Romania, while for Croatia, the Czech Republic, Hungary and Poland, the estimation results provide reasonably robust evidence on the detrimental effect of foreign exchange volatility on exports.

#### 4 The Asset Price Channel

Monetary policy is also capable of influencing asset prices, such as equity and housing. From a monetarist viewpoint, in the event that an expansionary monetary policy results in increased money supply, the actual level of liquidity held by the public will exceed its desired level. This, in turn, leads market participants to seek to decrease the liquidity at their disposal by buying equity,

bonds and housing, which results in a rise in the respective prices. An increase in bond prices is automatically translated into a decrease in the interest rate, which is already under pressure through the interest rate channel. Falling interest rates will then increase the attractiveness of equities, fueling equity purchases and causing equity prices to rise further. However, asset price reactions to monetary policy action can be asymmetric in nature. For instance, Ehrmann and Fratzscher (2004) show for the U.S.A. that the reaction of stock prices to a change in the interest rate is amplified if the change in the interest rate is unexpected,<sup>25</sup> if the change is in the direction opposed to that of the previous period, and in the presence of high stock market volatility.

#### 4.1 The Nonfinancial Corporate Sector

Higher equity prices eventually exert an influence on investment spending by altering the relationship between the cost of capital and the stock market valuation of that capital. This mechanism is described by *Tobin's Q* theory, where *Q* is defined as the market value of firms over the replacement cost of capital. Similarly, an increase in equity prices also affects household spending via the wealth effect. The basic idea behind *Q* is that as *Q* rises above unity, firms find their market value to be high relative to the replacement cost of capital; therefore, new investments are cheaper relative to the market value of firms. As a consequence, issuing fewer new shares at high prices enables firms to buy more new equipment at lower prices, which results in higher investment spending.

The *Q* theory is also applicable to the housing market. For example, a higher-than-unity *Q* implies a market value above replacement cost, which promotes construction output. Conversely, if *Q* is below 1, firms would not seek to buy new equipment because it is more advantageous to acquire other firms with a market value below their replacement cost of capital. Likewise, it is more favorable to buy old houses instead of constructing new ones. As a result, investment, household spending and construction activity decrease.

The empirical literature on *Tobin's Q* focuses on whether investment is correlated more with stock markets than with fundamentals (such as sales, cash flow, profits or the net present value of profits). While some authors find that investment closely follows fundamentals (Blanchard, Rhee and Summers, 1993), and that it is arguably difficult to relate *Tobin's Q* to the evolution of investment because of problems encountered when measuring the replacement cost of capital, there appears to be a broad consensus in the literature that stock prices and market valuation matter, to some extent, for investment decisions (Alexandre, 2002).

If market valuation plays a role in investment decisions, large fluctuations in asset prices unrelated to fundamentals, which lead to an over- or undervaluation of asset prices, can cause over- or underinvestment.<sup>26</sup> This raises the

<sup>25</sup> *The strong form of the efficient market hypothesis holds that asset prices incorporate all available information (even not publicly available information). Hence, only the unexpected component of the change can have an influence on asset prices.*

<sup>26</sup> *The fundamental component of asset prices reflects fundamentals such as the net present value of profits or dividends and hence does not lead to changes in fundamentals. In contrast, the nonfundamental part of asset prices leads to distortions in investment decisions, and thus to changes in fundamentals (Filardo, 2004).*

question of whether monetary policy should respond to asset price bubbles. The question is all the more relevant as asset price booms and busts are observed to occur on a regular basis (Filardo, 2004). According to Bernanke and Gertler (2000), monetary policy should react to asset prices only if they influence expected future inflation. It is also argued that reacting to asset prices may induce increased inflation volatility. However, Alexandre (2002) demonstrates that reacting to nonfundamental shocks to asset prices not only leads to more stability in inflation and asset prices, but also to more stable investment and thus, ultimately, to more stable output. Filardo (2004) argues that monetary policy should step in only in the event that an asset price bubble has macroeconomic implications (“macroeconomic” asset price bubble). Although it may prove tricky to identify and to react to such bubbles, Cecchetti et al. (2000) consider the related uncertainty not to exceed the one prevailing for other parts of the monetary transmission mechanism.

In addition, bubbles in different asset markets may be related to one another, which makes it even more difficult to deal with them properly. It is a stylized fact that the collapse of stock market bubbles is typically followed by a surge in property prices, largely as a consequence of a monetary loosening to ease the effects of the burst of the bubble on the equity market. Hence, “bubbles beget bubbles via a policy channel” (Filardi, 2004).

#### 4.2 Households

The *wealth effect* channel of equity and property prices is closely related to Modigliani’s lifecycle theory, in which household consumption spending is believed to be driven by disposable lifetime wealth. Because equity and property is part of this wealth, a rise (fall) in equity and housing prices triggered by monetary policy action results in increasing (diminishing) lifetime wealth and thus leads to an increase (decrease) in consumption spending.

An alternative view to the wealth effect is the so-called *liquidity effect*. In line with Mishkin (2001), spending on durable goods and housing is to a large extent influenced by consumers’ perception of the likelihood of running into financial difficulties. The higher the ratio of liquid financial assets to debt is, the lower the probability of financial distress will be. Thus, an increase in equity prices decreases the danger of future problems related to debt and therefore encourages households to consume more goods and housing.

#### 4.3 Spillover from or to Other Channels

The asset price channel interferes with other channels of the monetary transmission mechanism, and hence may amplify the overall transmission, mainly through the broad lending channel. A rise (fall) in the price of an asset (such as stocks, bonds or housing) triggered by monetary policy action strengthens (weakens) the balance sheet of firms and households. This, in turn, increases (lowers) their capacity to borrow from external sources because of the lower (higher) external financing premium.

If the credit channel is operational, an increase (decrease) in interest rates can lead to a drop (rise) in the stock price of firms which are subject to financial constraint because such firms are unable to supply their preferred amount of goods and services, so their expected future profits fall. This effect, in turn,

has a feedback effect on the credit channel, since a change in stock prices changes the external financing premium (plus the wealth effect) of the firm and of firms and households that hold shares of the firm.

A change in the monetary policy stance can also make firms' share prices more heterogeneous. The market valuation of firms which produce interest-sensitive goods or services will change more, as a change in interest rates modifies the demand for their goods and services (interest rate channel, Ehrmann and Fratzscher, 2004). In a second stage, such firms are more exposed to the credit channel.

Kiss and Vadas (2005), in the only study that analyzes asset prices – in particular housing prices – in monetary transmission in transition economies, find that both the wealth and the credit channel are at work in the Hungarian housing market, even though the effect of monetary policy has only a limited impact on house prices, housing investment and consumption. One important reason for this finding is that the institutional setting and public subsidy schemes insulate the housing market from monetary policy actions.

## 5 The Credit Channel

According to Bernanke and Blinder (1988), the traditional interest rate channel performs poorly, as changes in the long-term real interest rate, i.e. the cost of capital, appear to be only weakly related to changes in global demand and thus fail to explain the amplification effect of short-term interest rates on output. Given this, they extend the transmission mechanism by introducing the credit channel, which, they argue, is an enhancement channel that amplifies the interest rate channel. The credit channel can be decomposed into two distinct channels: (1) the *bank lending channel* and (2) the *broad lending channel* (also termed *balance sheet channel* or *financial accelerator*), which are dealt with below.<sup>27</sup>

### 5.1 The Bank Lending Channel

The bank lending channel can be formally modeled by introducing credit into the product markets in the traditional IS-LM setup (Bernanke and Blinder, 1988), where the IS curve is replaced by the credit-commodity (CC) curve to produce the CC-LM model. Central to the bank lending channel is the imperfect substitutability between credits and other financial assets in the banks' balance sheet on the one hand, and that between bank credits and other forms of financing on firms' balance sheet on the other hand. These two forms of imperfect substitutability cause monetary policy to impact on economic activity in two stages.

<sup>27</sup> A detailed overview of the theoretical and empirical literature related to the bank lending channel can be found in Kierzenkowski (2004).

Imperfect substitution in banks' assets ensures that a tightening (loosening) of monetary policy brings about a contraction (expansion) in banks' credit supply (first stage). When facing a decrease in liquidity,<sup>28</sup> banks reduce their credit supply instead of selling bonds they own because they have the desired level of liquidity to face, for instance, unexpected deposit withdrawals. Alternatively, banks could also issue bonds or collect deposits from households or from the corporate sector rather than decrease credit. However, the ability of some banks to borrow from financial markets may be limited by financial market imperfections, such as adverse selection and moral hazard (imperfect substitutability between credits and bonds on the asset side and bonds and deposits on the liability side).

For monetary policy to be transmitted to the real economy, it is necessary for some firms not to be capable of substituting bank credit for other forms of external funding on the capital markets (imperfect substitutability on the liability side of firms).<sup>29</sup> In such a case, once credit supply has decreased (increased), investment spending will be cut back because of the lack of external financial resources (second stage).

Underlying the analysis of Bernanke and Blinder are the hypotheses that (1) the income elasticities of credit demand and money demand are the same, and (2) the interest elasticity of credit demand equals that of credit supply. Kierzenkowski (2005a, 2005b) has recently shown that relaxing, in particular, hypothesis (2) implies that the bank lending channel need not automatically lead to an amplification in this framework and can, importantly, also cause attenuation.

## 5.2 The Broad Lending Channel<sup>30</sup>

Imperfect substitution in banks' assets and firms' liabilities, the cornerstone of the Bernanke-Blinder model, is not necessarily the case. In accordance with Kashyap, Stein and Wilcox (1993), while small banks cannot borrow on financial markets, larger banks definitely can. Similarly, larger firms have access to capital markets and can escape bank credit supply contraction. This leads us to a larger concept, namely to the broad lending channel. Imperfect substitution no longer exists between bank credits and other financing, but between external and internal financing,<sup>31</sup> where the cost of external financing is higher with the external financing premium. The external financing premium, in turn, primarily depends on net wealth<sup>32</sup> serving as collateral for loans and credits.

<sup>28</sup> Bernanke and Blinder (1988) assume that the central bank controls base money and that a tightening (loosening) of monetary policy decreases (increases) the liquidity of the banking sector. Alternatively, it is also possible to model monetary policy, which controls the interest rate. A simple way is to assume the stability of money demand functions, through which a change in the interest rate affects monetary aggregates. A more elaborate way is to introduce some kind of monetary policy reaction function, which links the policy rate to other variables.

<sup>29</sup> Central to this analysis is the special role banks play in the presence of asymmetric information, which has been widely acknowledged since the seminal articles of Akerlof (1970) and Fama (1985). In addition to reducing transaction costs (the cost of searching, verifying and monitoring costs) and transforming maturity, banks are in a good position to reduce problems related to asymmetric information (adverse selection and moral hazard), i.e. transforming risk. For a recent general overview on market imperfections, see DeGennaro (2005).

<sup>30</sup> This channel is also termed financial accelerator, balance sheet channel or borrower net worth channel.

<sup>31</sup> This contrasts with the Modigliani and Miller theorem on the neutrality of internal and external funding. Note that in the broad lending channel, banks no longer play a special role, like they do in the bank lending channel.

<sup>32</sup> Net worth or net assets are obtained as total assets minus total liabilities.

The higher the borrower's net wealth is, the lower the external risk premium is mainly because (1) higher (expected future) revenues enable one to finance investment internally, and (2) more valuable collateral increases the safety of the lender, thus decreasing both moral hazard and adverse selection. Consequently, any change in net wealth generated directly or indirectly by monetary policy will be reflected in the risk premium and thus in the capacity to borrow. Monetary policy can influence net wealth via the interest rate, asset price and exchange rate channels described earlier:

1. *Income effect (or cash-flow channel)*: An increase (decrease) in short term interest rates increases (decreases) the cost of servicing short-term and floating-rate debt, which reduces (raises) cash flow and thus net wealth.
2. *Debt channel*: An unexpected rise in inflation makes the real costs of servicing debt lower, as the terms of debt are determined nominally.
3. *Asset price channel 1*: An increase (decrease) in short-term interest rates lowers (increases) the price of equity, bonds and housing, which thus directly influences net wealth.
4. *Asset price channel 2 (wealth and liquidity effect of households)*: Monetary policy can impact on household borrowing capacity, as described in the asset price channel.<sup>33</sup>
5. *Exchange rate channel*: If assets or credits/loans are denominated in foreign currency, nominal exchange rate developments can increase (decrease) their value in domestic currency, which also exerts an influence on borrowing capacity.
6. *Second-round effects*: If household or firm spending falls as a consequence of monetary policy action, other firms' revenue also falls, leading to a decrease in net wealth as a function of rigidities on the cost side.

Therefore, decreasing (increasing) net wealth by lowering both equity and housing prices and cash flow (income effect) results in a decreased (improved) capacity to obtain loans because of the aforementioned imperfections of financial markets (adverse selection and moral hazard), which provoke a decrease (increase) in investment and consumption spending.

It is worth mentioning that the broad lending channel conveys not exclusively the effects of monetary policy, because alterations of other exogenous factors may lead to changes in the balance sheet of both households and non-financial corporations.

### 5.3 The Trade Credit and the Bank Lending Channel

Trade credit, which is usually created if a firm delays payment to its supplier, is thought to be more expensive than bank credit. However, this holds true only during "normal" times. Because the terms of trade credit are fairly stable over time, trade credit may become cheaper relative to bank credit in the wake of a monetary policy tightening. In fact, trade credit may become the only external source of financing for firms which have no credit rating and thus no access to

<sup>33</sup> It is noteworthy that both the bank lending channel and the broad lending channel apply not only to the investment of the nonfinancial corporate sector but also to household spending. On the one hand, a fall in credit supply related to consumption or housing reduces credit to households, which are particularly bank dependent. On the other hand, a decrease in the price of assets (bonds and equities) and housing stock held by households and a fall in income reduces the value of households' collateral for loans.

capital markets during credit rationing. As a result, if firms also have access to trade credit, instead of only bank and market financing, firms hit by external financing constraints in the wake of monetary tightening can potentially avoid the squeeze by increasing trade credit (see Mateut, 2004).<sup>34</sup>

#### 5.4 The Bank Capital Channel<sup>35</sup>

A number of recent papers put strong emphasis on the prominent role bank equity capital plays in the monetary transmission mechanism – also called the bank capital channel – through which monetary policy influences credit supply. The standard credit channel literature has been criticized because it assumes that the central bank affects loan supply by altering the required reserves. Chmielewski (2005) stresses that reserve requirements may be inappropriate, as, for instance, inflation-targeting central banks which use the interest rate as their main policy instrument may not be able to control required reserves. Yet changes in bank capital requirements may strongly affect loan supply. The bank capital channel has been formalized, for instance, by Van den Heuvel (2002). For the bank capital channel to be operational, the following assumptions need to apply: (1) it is costly for banks to raise equity, (2) banks assume an interest rate risk, with the maturity of their credit being higher than that of their deposits, and (3) capital regulations influence banks' credit supply.

The mechanism works as follows: A rise in interest rates triggered by monetary policy action increases the cost of financing (deposits) while leaving the remuneration of bank assets unchanged due to the maturity mismatch. This induces a fall in bank capital. In the event that the bank is close to the minimum capital requirement prescribed by law, it is obliged to decrease the supply of loans, as raising equity is costly.

According to Van den Heuvel (2002), banks with low capital react slowly, but then in an amplified fashion, to monetary policy shocks. Even banks with high capital can adjust their loan portfolio if they expect trouble in meeting capital requirements in the future or, as emphasized by Chmielewski (2005), they intend to maintain the same level of riskiness of their loan portfolio.

In a banking system where banks own a considerable amount of corporate equity, like in Germany, any change to the price of corporate equity will have a direct impact on banks' profit, capital and, consequently, on their credit supply (Markovic, 2004).

Markovic (2004) distinguishes between three subchannels of the bank capital channel:

1. The default risk channel. This channel is related to the eventuality that the bank defaults on its equity, which, in turn, depends on the default risk of firms.
2. The adjustment cost channel. This channel reflects asymmetric information between the bank and its shareholders and the fact that the elimination of this asymmetry is costly.

<sup>34</sup> Trade credit amounts to up to a quarter of firms' liabilities in the U.S.A., Germany, France and Italy (Mateut, Bougheas and Mizen, 2003) and is considerably higher in the U.K. (Kohler, Britton and Yates, 2000).

<sup>35</sup> Although the literature typically views the bank capital channel as a separate channel from the credit channel, for the sake of convenience, we put it in the same basket, because its implications are very close to those of the credit channel.

### 3. The capital loss channel.

Markovic (2004) argues that the capital cost channel is likely to gain importance in the occurrence of large shocks to bank capital, such as the writeoff of nonperforming loans or changes in the regulatory framework.

## 5.5 Trojan Horses Affecting the Credit Channel

There are a number of potential sources which could counteract the transmission mechanism of the bank lending channel in its first and second stages and the internal-external financing constraint crucial for the broad lending channel.

### 5.1.1 Factors Interfering with the First Stage of the Bank Lending Channel

1. Multibank holding networks are conducive to the creation of internal capital markets from which affiliated banks can benefit even though external financing resources have dried up. This is especially important for small banks, as, contrary to the basic assumption of the Bernanke and Blinder model, they can insulate their loan supply from monetary policy shocks (Ashcraft, 2005). This implies that a smaller number of banks are subject to imperfect substitutability on the asset side. In extreme cases where most banks belong to banking networks, as is the case in Germany or Finland, the bank lending channel might be completely disabled. (Ehrmann and Worms, 2004) argue that in such cases the existence of the bank lending channel depends on the financial situation of the network and not on the financial health of the individual banks. Gambacorta (2005) also shed light on the network effect for Italian banks.
2. A banking system which is well capitalized overall may be less conducive for the bank capital channel.
3. A high degree of concentration of the banking sector implies the absence of small banks. As large banks have easier access to alternative external financing, they can buffer their credit supply from monetary policy shocks (Adams and Amel, 2005).
4. There is crucial interaction between the credit channel and the interest rate pass-through. It appears that more concentrated markets are less vulnerable to the credit channel. At the same time, banks on these markets do not tend to react proportionately to interest rate changes. Hence, they cushion the effect of monetary policy not only for quantities but also for prices, and this weakens the overall impact of monetary policy on the real economy.
5. The maturity structure of loans and the tradeoff between fixed or variable interest rates can very much determine the reaction of loan supply to monetary policy actions. The shorter the maturity structure, the more immediate the pass-through from monetary policy to loan supply is supposed to be (Ehrmann et al., 2001).
6. Relationship lending, i.e. the phenomenon of the *hausbank*, may lead to loan commitments, which could help disconnect loan supply from monetary policy to some extent (Ehrmann et al., 2001).

7. The government's involvement in the banking sector either as an owner or via public guarantees can partially offset the effects of monetary policy on loan supply (Ehrmann et al., 2001).
8. If loans to the private sector are denominated in foreign currency, domestic interest movements have only a limited effect on the supply of and demand for loans, since their price is given by the foreign interest rate plus the exchange rate premium.<sup>36</sup> A contracting monetary policy manifesting itself in higher interest rates would have an opposite effect than desired, as it would cause an appreciation of the exchange rate, which, in turn, would lead to a shrinkage of foreign currency-denominated loans in domestic currency terms. The higher the share of foreign currency-denominated loans in total lending is, the lower the direct impact of domestic monetary policy on domestic lending and borrowing activity.

### 5.5.2 Factors Interfering with the Second Stage of the Bank Lending Channel

A number of other factors in addition to trade credit and other sorts of intercompany loans can potentially break down the second stage of the bank lending channel:

1. A potential attenuation of both the bank lending and the broad lending channel can occur if firms are able to insulate themselves from short-term shocks in bank or external borrowing via altering capacity utilization, if financial constraints are anticipated in advance (Wang, 2001).
2. Government involvement may also mean soft budget constraints for firms (Kornai, Maskin and Roland, 2003). This issue may be especially important for transition economies, where the hardening of the budget constraint may vary as a function of how advanced the privatization of both the non-financial corporate sector and the banking sector is and how much progress has been made in introducing bankruptcy laws, accounting standards and Western corporate governance. In particular, soft budgets may be due to open subsidies or implicit subsidies (tolerance of tax arrears, tax relief and tax concessions) from the government or easy access to new credits from state-owned banks. Soft budget constraints are still present at least in some sectors of less advanced transition countries, such as Bulgaria, Croatia and Romania, let alone the CIS countries (see Croitoru and Schaffer, 2002, for Romania). However, one may also argue that soft budget constraints mostly concern larger firms, which would otherwise be less exposed to the credit channel.
3. If small firms' contribution to output is low, or if only a small fraction of (small) firms relies on bank lending, the macroeconomic impact of the bank lending channel will be negligible.<sup>37</sup>
4. If the distribution of small firms differs across sectors, the impact of monetary policy acting via the credit channel may be heterogeneous across sectors. In particular, the share of small firms in output is considerably larger in the nontradable than in the tradable sector (Tornell and Westermann,

<sup>36</sup> Plus default risk, but this is also contained in the domestic interest rate.

<sup>37</sup> The capitalization and liquidity position of firms are also important for the functioning of the credit channel. Although large firms may also be weakly capitalized and less liquid, small firms are usually less capitalized and less liquid than large firms.

2002). Hence, the credit channel may be more important for the nontradable sector.<sup>38</sup>

In general, the macro-evidence of the bank lending channel in industrialized economies seems to be fairly weak. However, loans to households may be more responsive to monetary policy shocks than corporate loans. Even so, the extent to which those changes matter for household consumption remains controversial. The use of micro bank and firm-level data suggests that bank lending activity may be affected by monetary policy. However, there is no consensus on which characteristics of banks (size, liquidity, capitalization) matter most. The second stage of the bank lending channel appears to be more debated, as some authors point out the existence of a broad lending channel instead of a bank lending channel. In addition, trade credit seems to be an important source of external financing for firms with no credit rating.

## 5.6 Empirical Evidence for CEE

### 5.6.1 Evidence from VAR

The body of empirical literature focusing on CEE is quite specialized in the sense that most studies concentrate on the first stage of the bank lending channel and only a few make use of the VAR approach. Hence, a number of possibilities still await exploitation. Let us first consider the small amount of evidence generated by VAR models. For Poland, Wróbel (2001) shows that a shock in short-term interest rates causes real credit to drop in the short run and to stabilize at a lower level afterward. Creel and Levasseur (2005) find that after the initial decrease, credit recovers for Poland. For the Czech Republic and Hungary, the results indicate a short-term rise, rather than a fall, in the credit series after a monetary policy shock. Finally, Héricourt (2005) studies the impact of a credit shock on output and prices. The general outcome is that a credit shock temporarily increases both output and prices (for Poland, Slovakia and Slovenia). For the Czech Republic, output first falls and then recovers. For Estonia, the results for prices depend on whether GDP or industrial production is used. However, special care should be taken with these results because in some cases, the impulse response functions (IRFs) look unusual, i.e. they exhibit a cyclical fluctuation around zero, which is difficult to explain. The second cautionary note applying to all three studies is that the vast majority of IRFs are not significantly different from zero when taking account of the confidence intervals.

### 5.6.2 Evidence from Bank-Level Data

Turning to the micro data-based evidence, this strand of the literature uses a variant of the approach taken in Ehrmann et al. (2001), which, in turn, is an improvement of Kashyap and Stein (2000):

$$\Delta L_{it} = \sum_{j=1}^4 \alpha \Delta L_{j|t-j} + \sum_{j=1}^4 \beta_j M_{it-j} + \sum_{j=1}^4 \beta_j Y_{t-j} + \sum_{j=1}^4 \lambda_j \Delta P_{t-j} + C_{it-1}(\phi + \sum_{j=1}^4 \eta_j M_{it-j} + \sum_{j=1}^4 \kappa_j Y_{it-j} + \sum_{j=1}^4 \pi_j \Delta P_{t-j}) \quad (5)$$

<sup>38</sup> It is interesting to note that the vast majority of empirical studies concentrate on the open sector, i.e. manufacturing. Hence, they may miss the point.

where  $\Delta L_{it}$  is the loan supply growth rate for bank  $i$  for period  $t$ ,  $M$  measures monetary policy,  $Y$  is real output and  $C$  denotes bank characteristics. Note that equation (5) is usually estimated separately for different bank characteristics ( $C$ ). That is, a separate regression is run, for instance, for size, liquidity, capitalization and ownership structure. Horváth, Krekó and Naszódi (2005) extend this list with the average cost of funds. Note, however, that a number of authors also simultaneously include all bank-specific characteristics (e.g. Havrylchyk and Jurzyk, 2005; Köhler, Hommel and Grote, 2005; Schmitz, 2004) or only two at the same time (Horváth, Krekó and Naszódi, 2005).

Overall, the empirical results strongly support the view that banks react differently to monetary policy changes depending on the above-listed characteristics. However, the bank-level characteristics are not equally important. For instance, Juks (2004) finds that the supply of household and corporate loans turn out to be most affected for banks with a low level of liquidity, while bank size and capitalization does not matter. Merging data on aggregate loans for the three Baltic countries, Köhler, Hommel and Grote (2005) and Matousek and Sarantis (2006) come to a similar conclusion, although Matousek and Sarantis (2006) also find size to be an important factor. Bank capitalization may not matter for two reasons. First, capitalization measured at the bank level may not be an appropriate measure. Instead, the capitalization of an entire bank holding should be considered. Second, as also noted by Ehrmann et al. (2001), bank capitalization is high enough not to be affected by changes in monetary conditions. A final finding is that none of the three characteristics (size, liquidity and capitalization) are correlated with corporate loan supply in a robust manner.

In a similar vein, Schmitz (2004) shows for a set of CEE countries that size and the liquidity position seem to matter and that foreign-owned banks have a more pronounced reaction to a change in domestic and foreign monetary conditions than their domestic counterparts do. However, pooling all countries may mask considerable cross-country heterogeneities, as country-specific studies suggest. An excellent example is Matousek and Sarantis (2006), who cover the CEE-5 plus the three Baltic countries to show substantial country differences. In addition to the heterogeneity prevailing across countries, sometimes the results are quite colorful even for the very same country. Poland is a case in point. Havrylchyk and Jurzyk (2005) find that the better liquidity position enables banks to insulate loans from monetary policy actions. Weak evidence is also found for the size of the banks. However, the estimated coefficient indicates that smaller banks are in a better position to shield themselves from monetary policy. Finally, bank capitalization turns out to play no role in the lending behavior of banks. This stands in strong contrast with Wróbel and Pawłowska (2002), who find that size and capitalization explain bank lending behavior in the face of a monetary policy move in a standard manner (larger and more capitalized banks react less), while more liquid banks are more responsive to an increase in the policy rate than less liquid banks. This counterintuitive finding can be explained, according to the authors, by the overliquidity of the Polish banking sector. The most robust variable in the regressions run by Chmielewski (2005) and by Matousek and Sarantis (2006) is capitalization, which indicates that better capitalized banks are shielded from

the effects of monetary policy. Foreign involvement generally turns out to result in more responsiveness to monetary policy. The results for liquidity are in conformity with the findings in Wróbel and Pawłowska (2002). Finally, it deserves to be mentioned that the effect of bad loans may have opposite signs across different specifications, and, importantly, foreign currency-denominated loans, especially to households, are very insensitive to monetary policy actions.

For the Czech Republic, Matousek and Sarintis (2006) find that size, capitalization and liquidity are important from 1994 to 2003, whereas Pruteanu (2004) comes to the conclusion that better capitalized and more liquid banks appear to be less responsive to monetary policy from 1996 to 1998 but not from 1999 to 2001. In contrast, the result that larger banks and banks with more bad loans in their portfolio care less about monetary policy can lead back to the existence of a soft budget constraint mainly because of the unaccomplished privatization of the banking sector. In addition, it seems that size is especially important for foreign banks for which the coefficient switches sign between the two subperiods. From 1996 to 1998, larger foreign banks were more affected by monetary policy actions, while from 1999 to 2001, smaller foreign banks were more responsive. Liquidity matters for foreign banks in the first subperiod, while it becomes important for Czech banks and foreign branches in the second subperiod.

For Hungary, Horváth, Krekó and Naszódi (2005) show that using more disaggregated loan series makes it easier to pin down the bank lending channel and that all bank characteristics have a role to play, although their results also reveal that some of the bank characteristics are not particularly robust. This contrasts with Matousek and Sarintis (2006), who can identify size as the only variable explaining diverging bank lending activity as a result of monetary policy changes. Furthermore, the results reported in Horváth, Krekó and Naszódi (2005) indicate that foreign currency-denominated corporate loans are very unresponsive to monetary policy actions.

Finally, according to Golodniuk (2005), Ukrainian banks react differently to changes only as a function of capitalization but not as a function of size and liquidity.

Table 3

Results of the Empirical Literature on CEE								
Author	Country	Type of assets	Size	Liquidity	Capitalization	Bad loans	Ownership	
Schmitz (2004)	CEE-5 + B3	Total loans	Yes	Yes		..	Yes	
Pruteanu (2004)	Czech Republic	Total loans – bad loans	Yes	Yes	Yes	Yes	Yes	
Matousek and Sarantis (2006)	Czech Republic	Total loans	Yes	Yes	Yes	..	..	
Köhler et al. (2005)	B3, pooled	Total loans		Yes		..	..	
Matousek and Sarantis (2006)	B3, pooled	Total loans	Yes	Yes		..	..	
Juks (2004)	Estonia	Bank deposits			Yes	..	..	
		HH loans		Yes		..	..	
		COR loans		?	?	..	..	
Horváth et al. (2005)	Hungary	Total, domestic COR, HH loans	Yes	Yes	Yes	..	Yes	
		FX COR loans				..	..	
Matousek and Sarantis (2006)	Hungary	Total loans	Yes			..	..	
Havrylychuk and Jurzyk (2005)	Poland	Total loans	?	Yes		..	..	
		Deposits				..	..	
Wróbel and Pawloska (2002)	Poland	Total loans	Yes		Yes	..	..	
Chmielewski (2005)	Poland	HH loans – DC			Yes	Yes	Yes	
		HH loans – FX				Yes	..	
		COR loans – DC			Yes	Yes	Yes	
		COR loans – FX			Yes	Yes	Yes	
Matousek and Sarantis (2006)	Poland	Total loans			Yes	..	..	
Matousek and Sarantis (2006)	Slovakia	Total loans	?	?	?	..	..	
Matousek and Sarantis (2006)	Slovenia	Total loans	?	?	?	..	..	
Golodniuk (2005)	Ukraine	Total loans			Yes	..	..	
		Consumer loans			Yes	..	..	

Source: Authors.

Note: ? indicates weak evidence in favor of the given variable. HH and COR stand for households and the nonfinancial corporate sector. DC stands for loans denominated in domestic currency, FX for those in foreign currency. CEE-5 stands for the Czech Republic, Hungary, Poland, Slovakia and Slovenia; B3 stands for the three Baltic countries. “..” indicates that the given study does not consider this variable.

## 5.7 Some Criticism

A number of critical remarks about the literature aimed at studying the credit channel in CEE are in order. The literature is still very scarce and deals with selected aspects of the credit channel. No attempt has been made so far to systematically investigate how interest rates affect credit aggregates and how changes in credit aggregates influence output and prices. This is particularly true of micro-based panel studies, which have yet to analyze the second stage of the bank lending channel. As we know, even though bank lending behavior is influenced by monetary policy steps, for the bank lending channel to be operational, firms must be found to rely solely on bank loans.

Chmielewski (2005) provides a good example in looking at loan series split into domestic and foreign currency denominations and into corporate and household loans. Perhaps a little more disaggregation into different segments of the corporate and household market (short-term, long-term, consumer, housing and automobile credit) would help us understand better how, if at all, the credit channel works in CEE. A remaining future challenge is to obtain estimates from bank- and firm-level datasets of the adjustment in output and prices in the aftermath of a change in monetary policy.

But perhaps the most important shortcoming of the literature relating to the credit channel in general is that it assumes that credit markets are in equilibrium and that the credit series used for estimations reflect this equilibrium. However, disequilibrium in the credit market may have impor-

tant implications for monetary policy. If there is excess demand for credit, banks tend to ration credit and may thus amplify (attenuate) the effect of a monetary policy tightening (loosening). In contrast, if the supply of credit exceeds the demand for credit, perhaps because banks hold too much liquidity, banks will not pass changes in the policy rate through to their retail rates in the event of a monetary policy tightening,<sup>39</sup> because this would reduce the demand for credit, which is already insufficient to clear the market. Nonetheless, an interest rate cut would be very quickly incorporated into loan rates (Hurlin and Kierzenkowski, 2002, 2003). Hurlin and Kierzenkowski (2003) identify excess credit supply until mid-1999 and a regime of excess demand for credit in Poland and argue that the existence of these two regimes may explain why Polish monetary policy became much more efficient after 1999.

## 6 Systematic and Shock Effects of Monetary Policy

The literature reviewed thus far relates to the systematic effects of monetary policy actions on inflation and the real economy. However, VAR studies provide a (black-box) framework in which the impact of monetary policy shocks on prices, output and macroeconomic variables can be quantified. This section summarizes the main issues of this literature, namely the price puzzle, and then presents the empirical findings for the CEEs.

### 6.1 Price Puzzle I

A huge amount of effort has been devoted to uncovering the impact of an unexpected monetary policy shock on output and inflation. This literature has produced the so-called “price puzzle,” according to which a monetary policy contraction causes a rise in the inflation rate rather than a drop. While some authors qualified only the response of prices nonsensical and went on interpreting the reaction of the other variables to the shock, the vast majority of researchers have argued that the price puzzle invalidates all the other responses as well. In this spirit, several suggestions have been proposed to deal with this problem.<sup>40</sup>

A first group of papers, including that of Sims (1992), claimed that the forward-looking component of the monetary policy shock might have been misidentified, and the inclusion of commodity prices in the system makes the puzzle disappear. The underlying idea of this line of thinking is that policymakers in central banks also look at variables that are disregarded by academic studies and that help forecast inflation. Yet VAR models extended in this manner usually include only up to eight or ten variables, which represent only a small proportion of the information set available to policymakers. The combination of factor analysis with VAR models, which gives rise to factor-augmented VARs (FAVARs), provides a remedy to this problem. In such a setting, a small number of factors (principal components) summarizes the information extracted

<sup>39</sup> This connection shows how the state of the credit market influences the interest rate pass-through.

<sup>40</sup> A more fundamental criticism of the VAR literature formulated by Bernanke, Gertler and Watson (1997) and McCallum (1999) is that VAR models capture only unanticipated changes in monetary policy rather than the systematic relationships that connect monetary policy instruments and the economy. Accounting for long-run relations is all the more important, as the unexpected component of monetary policy represents only a small fraction of changes in monetary policy (McCallum, 1999).

from a large number (perhaps over 100) of time series (Bernanke, Boivin and Elias, 2005).

However, Giordani (2004) and Hanson (2004) argue that variables good at predicting inflation (such as accurate inflation forecasts) are not helpful in solving the price puzzle. Giordani (2004) emphasizes the need to use the output gap as a remedy for the puzzle. Indeed, commodity prices may help to mitigate the puzzle only because they are correlated with the U.S. business cycle. Hanson (2004) shows that the price puzzle is attributable to the fact that the estimated VAR models cover periods during which there is a change in the monetary policy rule. Once the period is carefully hand-picked to remove overlaps between different monetary policy rules, the price puzzle disappears.

Another strand of the literature, initiated by Barth and Ramey (2000), takes the position that the price puzzle is not generated by methodological problems. Instead, prices tend to rise in the wake of a monetary policy tightening because an increase in interest rates gives rise to higher production costs reflected in higher inflation rates. They find that the so-called cost channel was more important during the 1960s and 1970s and then declined during the 1980s and the 1990s in the U.S. economy.<sup>41</sup> For small open economies, the price puzzle is likely to arise if the nominal exchange rate is not included in the VAR (Kim and Roubini, 2000).

## 6.2 Price Puzzle II

In the meantime, a price puzzle seems to be taking shape for emerging market economies. In these countries, a monetary restriction causes a rise in inflation if public debt is high. According to this view, a monetary policy tightening reflected in higher real interest rates increases the probability that the government will default as a consequence of higher interest payments. Hence, the risk premium rises, pushing foreign capital to leave the country, which, in turn, causes the exchange rate to depreciate. If the exchange rate pass-through to domestic prices is high enough, such a depreciation leads to rising inflation (Blanchard, 2004, and Favero and Giavazzi, 2004).<sup>42, 43</sup>

## 6.3 The Exchange Rate Puzzle

Mojon and Peersman (2001) detect an exchange rate depreciation in the aftermath of a monetary policy innovation for Italy and Spain, which had trouble defending their exchange rate in 1993. This so-called exchange rate puzzle can be traced back to the fact that monetary policy reacted with an increase in short-term interest rates, mostly in vain. This also helps explain the price puzzle because nominal exchange rate depreciation feeds into domestic inflation (exchange rate pass-through). Nonetheless, if monetary policy shocks are in fact a response to changes in the exchange rate, then the issue at hand is the

<sup>41</sup> As they put it, *unexpected monetary policy shocks can be best viewed as a combination of cost (supply) shocks and demand shocks.*

<sup>42</sup> Recall that Burstein et al. (2002, 2004) show that the inflationary effect of a large devaluation will be limited because of the distribution-related component of goods sold to the consumers and because of the switch from imported goods to domestic substitutes.

<sup>43</sup> The price puzzle was developed in the context of Brazil. It also applies to the case of other large emerging markets such as Turkey (Aktas et al., 2005).

misidentification of monetary policy shocks, leading to a basic dismissal of the results.

#### 6.4 Empirical Findings for CEE

Heterogeneity in results is an accompanying phenomenon of the ever growing number of VAR studies with a focus on CEE. According to table 4, which reports the main conclusions of the individual papers, all kinds of results can be found for a given country. In this sense, the price puzzle, a permanent decline or a temporary fall in the inflation rate after a monetary policy contraction can be obtained for the same country. Also, output may increase, decline permanently or exhibit a humped shape following a monetary policy shock. However, it turns out that studies that cover the entire transition period<sup>44</sup> (starting from the early 1990s) and that rely on recursive VAR models (European Forecasting Network, 2004; Creel and Levasseur, 2005; Héricourt, 2005) tend to obtain a price puzzle. In contrast, papers allowing for changes in the parameter estimates either by splitting the whole sample into subsamples (Arnostova and Hurník, 2004; Vonnák, 2005), by relying on genuine time-varying coefficient estimates (Darvas, 2005) or by employing a more sophisticated and hence more precise identification scheme of monetary policy innovation (Vonnák, 2005; Jarociński, 2005). The price puzzle in the Czech Republic may be due to the emergence of the exchange rate puzzle during the 1997 period (Arnostova and Hurník, 2004). Jarociński (2005) compares the mean of the impulse response functions of four CEE economies (the Czech Republic, Hungary, Poland, Slovenia) to that of five euro area countries (Finland, France, Germany, Italy and Spain) and finds that the reaction of prices and output to monetary policy shocks is stronger in CEE than in the euro area.

In sum, as put forth by Elbourne and de Haan (2004) for industrialized countries, the main sources of cross-study heterogeneity in results are (1) the different time period, (2) the use of different schemes to identify monetary policy shocks, and (3) the use of a different set of variables.<sup>45</sup>

<sup>44</sup> Quite surprising is the fact that the European Forecasting Network (2004) estimates a VAR for Hungary for a period starting in 1985. Obviously, it is difficult to obtain meaningful results when a period covers the end of central planning and the early and the later stages of the transition process.

<sup>45</sup> Héricourt (2005) also argues that it does matter whether one employs industrial production or GDP figures for output.

Table 4

### Summary of VAR Results

Author	Results
Arnostova and Hurník (2004)	CZ, full period: foreign exchange and price puzzle, output: U-shaped 1998, price and output: U-shaped, no foreign exchange puzzle
Bitans et al. (2003)	LV, prices: slow decrease and then slow recovery
Creel and Levasseur (2005)	Inflation: price puzzle for all countries Output increases for 1999 to 2004, no reaction for HU
Darvas (2005)	Price puzzle in CZ (1998, 2004), HU (1994, 1998), drop in prices in PL Output: drops most in PL, least in HU, but recovers more quickly in PL than in HU Response profiles change over time
EFN (2004)	Mostly not significant (EE, SI, LT) Inflation: CZ price puzzle, HU, LV U-shaped, SK permanent decrease (Q), U-shaped (M), PL no significant change (Q, M) Output: CZ, HU U-shaped; PL strong drop then recovery (M), SK permanent increase
Elbourne and de Haan (2006)	CEE-10; inflation: largest and quickest drop in SK and RO; PL, CZ protracted, others small; HU price puzzle Output: large and quick drop; CZ mostly quick; SK and EE slow
Ganev et al. (2002)	Inflation: SI, CZ permanent rise, LV, SK temporary fall, HU permanent fall Output: decrease is fastest in HU, more permanent in CZ, decreases and adjustment in SK and SI, increases in the remaining countries; BG, RO large fluctuations
Héricourt (2005)	Inflation: CZ, price and foreign exchange puzzle; HU, SI price puzzle Output: CZ, GDP and IIP different EE, PL, SK: no significant change
Jarociński (2005)	CEE-4: decline in output and prices
Kuijs (2001)	M2 shock: SK, increase in inflation (unit labor cost increase), little impact on output
Maliszewski (1999)	Inflation: PL declines and recovers partially Output: PL declines and recovers partially (more strongly than inflation)
Maliszewski (2002)	Inflation: CZ, PL slow decline and stabilization at lower level Output: CZ, PL hump-shaped, but not full recovery
Vonnák (2005)	HU: 1992 to 2003 price puzzle HU: 1995 to 2003 quick decline in output, slow decline in prices, currency appreciation
Wróbel (2001)	Prices: PL increase followed by decrease and slight recovery, but still negative Output: PL increase followed by decrease and full recovery Credit: PL large decrease followed by slow recovery

Source: Authors.

Note: CZ, EE, HU, LV, LT, PL, RO, SK, SI denote the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. The CEE-10 include these countries and Bulgaria. The CEE-4 cover CZ, HU, PL and SI. Q and M refer to quarterly and monthly frequencies.

## 7 Concluding Remarks

The determinants of the different channels of the transmission mechanism set out in this paper may give us some clues about the past and possibly about the future development of the different channels. Starting with the very first step of the transmission mechanism, the interest rate pass-through improved substantially from the beginning of transition until the present, both in terms of the speed of adjustment toward long-term pass through and of the size of the long-run pass-through, mostly because of the development of the financial and banking sectors in these countries.

Speculating about the future from a macro-perspective, money market volatility is bound to fall to euro area levels after euro adoption, and financial depth is likely to rise in the years to come. At the same time, inflation rates will close the gap to euro area inflation, and long-run GDP growth may slow down as real convergence progresses. The first two factors will work toward an increase in the pass-through while the next two variables could dampen it.

Looking at the structure of the banking sector, e. g. Poland, Slovenia and Latvia have fewer foreign investors, partly because of slower banking sector reform. Poland and Slovenia are the countries with the highest burden of non-performing loans, and Slovenia has the lowest capital adequacy ratio, which is still comparable to that of the euro area, however. All this is admittedly detrimental to the pass-through. So, by making efforts on the front of banking reforms, these countries would be able to enhance the interest rate pass-through. However, market concentration has recently been on the rise in most of these countries. Very high concentration rates can be observed in Estonia and Lithuania, while concentration is lowest in Hungary and Poland. Generally, market concentration is higher than in the euro area and is still on the rise, indicating in our opinion that the interest rate pass-through may slow down and become less complete in these countries in the future.

Let us now turn to the issue of the exchange rate pass-through. Although trade and import exposure rose sharply in all countries except for Slovenia, the exchange rate pass-through has decreased over time and is expected to be stabilizing at a lower level. The main reason for this decrease is the steady fall in inflation rates to very low levels in all countries, perhaps with the exception of Romania and Russia, and the abandonment of accommodative monetary policies. The composition effect, measured as an increase in the share of manufactured goods in total imports, is fairly substantial in all countries, with the exception of Slovenia. However, its role is not clear-cut, given that the pass-through for this group of goods is found to be higher on occasion than for more homogeneous goods. Even so, and because of an expected decline in relatively high inflation volatility and exchange rate volatility, the exchange rate channel will lose its prominent role in the monetary transmission mechanism, if it has not done so already. However, changes in the exchange rate may have a strong impact on the balance sheet of firms and households, if there is a currency mismatch between revenues and expenditures. Currency mismatch may be an issue because of the recent surge in foreign currency-denominated household loans and, to a lesser extent, in loans to the corporate sector. After euro adoption, the effect of the pass-through will come directly from trade with countries outside the euro area, and indirectly via the direct impact of the major currencies' fluctuations against the euro (EUR/JPY, EUR/GBP and EUR/USD) on the main euro area trading partners, such as Germany, France and Italy.

The asset price channel is still of limited importance and is probably going to remain a low-profile transmission channel. Stock and bond markets matter little to investment and consumption decisions through the wealth and income effects, given that these markets are dominated massively by foreign investors rather than by domestic ones. As a consequence, price movements on these markets have a limited impact on the domestic economy via these two effects. Even though the effect of monetary policy via the property market does not appear to be very important for the time being, this channel may grow more powerful in the future with the dynamic development of borrowing related to housing.

The limited role of the capital market manifests itself not only for the asset price channel, but has also important implications for the credit channel.

Obviously, new funds raised on both stock and bond markets are virtually close to zero in CEE, as only a very limited number of companies get listed on the stock market and as bond markets are used for financing public debt. This is unlikely to change in the near future. As a consequence, one may think that the financing of the nonfinancial corporate sector transits through the banking sector.

Nonetheless, there are several factors that may weaken the credit channel. First, the high concentration of the banking sectors, the heavy involvement of foreigners, the high degree of liquidity and more than sufficient levels of bank capitalization render banks less responsive to domestic monetary policy impulses. Second, notwithstanding the absence of well functioning capital markets, firms may escape from domestic credit markets either by borrowing in foreign currency or by relying on trade credit and other kinds of inter-company loans relating to transnational networks created by FDI.

The moderately good news for the effectiveness of monetary policy is, however, that firms capable of escaping domestic monetary policy conditions are strongly influenced by monetary policy in the euro area either because foreign currency loans are denominated in euro, or because their parent institutions are themselves subject to the credit channel in the euro area.

When looking at the recipient sectors and the distribution of small and large firms across sectors, it appears that the manufacturing sector is less subject to the credit channel than the rest of the economy, in particular the service sector. First, FDI inflows to manufacturing were disproportionately high. Second, small firms are mostly concentrated in nontradables. Argued the other way around, the credit channel is likely to be operational for the market-based nontradable sector and may have a strong impact on this part of the economy. Even though services account for about 70% of GDP in most countries, the country-specific impact is heterogeneous depending on how large the contribution of small firms to GDP is and how large public involvement in nontradable sectors is.

In addition, households mainly rely on bank borrowing.<sup>46</sup> We will witness the emergence and a subsequent strengthening of the credit channel for households with a buildup in the stock of household loans. However, monetary policy will affect this segment of the economy only partially and relatively slowly, given that the interest rate pass-through is lowest and most sluggish for consumer loans. As we argued earlier, the interest rate pass-through may slow down in the course of the coming years. This may indeed further cushion the impact of monetary policy through the credit channel.

Finally, while the credit channel is likely to be at work or to gain importance in the nontradable sector and in the household sector, the interest rate channel may have a larger impact on the manufacturing sector. The final impact of monetary policy on output and prices of the manufacturing sector depends crucially on how parts of manufacturing react to changes in the interest rate. Although the share of manufacturing is fairly stable at around 20% for all countries under study, its composition differs substantially from country to country. For instance, food production plays an important role in Poland,

<sup>46</sup> Note, however, that in the mortgage market there is fast-growing activity by nonbanking financial institutions.

Bulgaria, Croatia and Romania, while the Czech Republic, Hungary and Slovakia excel in producing electrical, optical and transport equipment. To the extent that these sectors differ in terms of markup (high or low markup sectors), they may have different reactions in different channels, as we set out above. Hence, a heterogeneous response of these sectors to monetary policy innovations may generate substantial cross-country heterogeneity to monetary policy impulses.

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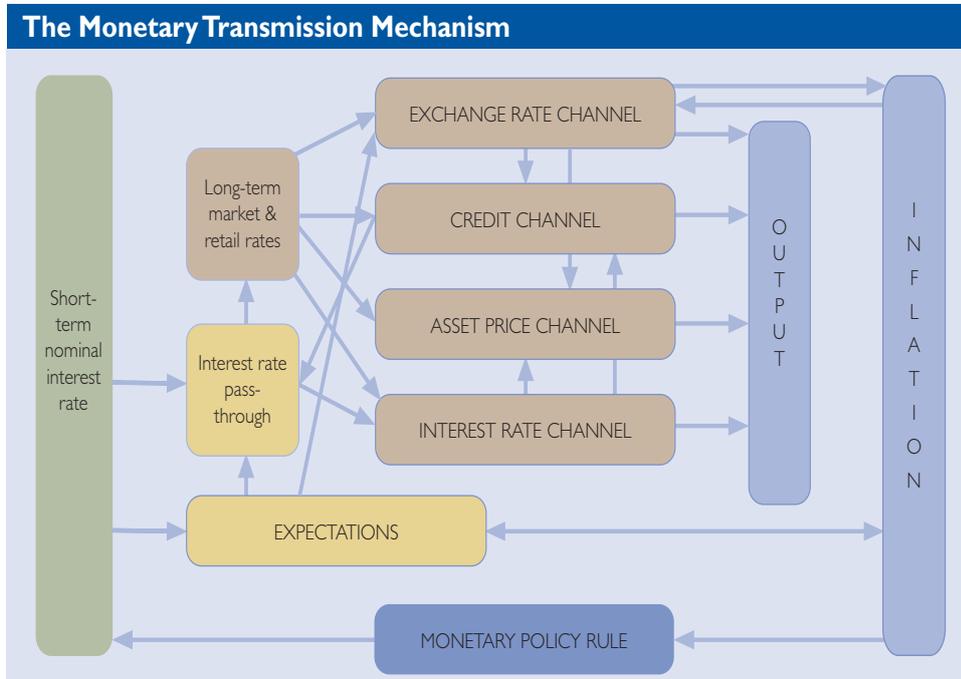
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Appendix

Chart 2



Source: Authors.

# Interest Rate Pass-Through in Central and Eastern Europe: Reborn from Ashes Merely to Pass Away?

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Balázs Égert,  
Thomas Reininger<sup>1</sup>

*In this study, we seek to better understand the interest rate pass-through in five Central and Eastern European countries – the Czech Republic, Hungary, Poland, Slovakia and Slovenia, the CEE-5 – and compare it with the pass-through in selected euro area countries – Austria, Germany and Spain. We find that the pass-through is not operational for long-term market rates because of the unstable yield curve. We find evidence that the pass-through from policy rates even transits through short-term market rates to long-term retail rates. Although nearly complete pass-through is detected for corporate lending rates in a majority of the CEE-5, pass-through estimates for several retail rates are generally lower than those reported in the literature, given the absence of cointegration between policy rates and long- or even short-term market rates. Although the pass-through is usually higher in the CEE-5 than in Austria and Germany, it has been declining over time in particular in Hungary and (with respect to lending rates) in Poland. The adoption of the euro seems to have slightly increased the pass-through in Spain and Austria but not in Germany.*

## 1 Introduction

The introduction of direct inflation targeting in a number of Central and Eastern European (CEE) countries has made it necessary to rely more heavily on the interest rate and the credit channel, while diminishing the prominent role of the exchange rate in the monetary transmission mechanism.

It is essential for central banks to have a genuine and precise understanding of how fast and to what extent a change in their interest instrument modifies inflation. In particular, it is crucial to assess whether or not the pass-through from monetary policy rates to long-term market and retail rates is complete, as this is the first building block for the monetary transmission mechanism. If the interest rate pass-through is not complete, the impact of monetary policy actions through the credit, interest rate or exchange rate channels will be considerably attenuated. Against this backdrop, a large amount of research has been dedicated to the interest rate pass-through in industrialized countries: it is generally found to be incomplete and to react sluggishly to changes in the policy rate.<sup>2</sup>

More recently, researchers have turned their attention to the CEE countries and showed a strengthening of the pass-through over time.<sup>3</sup> In this paper, we contribute to this subject for the Czech Republic, Hungary, Poland, Slovakia and Slovenia by not only looking at the relationship between monetary policy rate on the one hand, and market and retail rates on the other hand, but also by studying the whole chain of transmission running from the

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<sup>2</sup> See e.g. DeBondt (2005) and Sander and Kleimeier (2004a) for euro area results.

<sup>3</sup> See e.g. Horváth, Krekó and Naszódi (2004) for Hungary; Opiela (1999), Chmielewski (2003) and Wróbel and Pawłowska (2002) for Poland; Crespo-Cuaresma, Égert and Reininger (2004), Sander and Kleimeier (2004b) and Tieman (2004) for a number of CEE countries.

policy rate via market rates to bank retail (deposit and lending) rates in a multivariate Vector Autoregression (VAR) setting.

With a view to the future adoption of the euro in the CEE-5, it is important to find out more about whether or not the euro area will grow more inhomogeneous with respect to the monetary transmission mechanism. For this reason, the empirical analysis is also carried out for selected euro area countries: Austria, Germany and Spain.<sup>4</sup> Another reason for us to include these countries was the need to check the validity of the general finding in the literature which suggests that the interest rate pass-through is larger and also quicker in CEE countries than in established industrialized countries.

The remainder of this paper is structured as follows: Section 2 deals with theoretical and empirical issues related to the interest rate pass-through. Section 3 describes the dataset, Section 4 outlines the estimation techniques and Section 5 presents the results. Finally, Section 6 gives some concluding remarks.

## 2 Interest Rate Pass-Through

The interest rate pass-through can be decomposed into two stages. The first stage measures how changes in the monetary policy rate are transmitted to short- and long-term market rates, while the second stage describes how changes in the market rates influence bank deposit and lending rates.

### 2.1 Pass-Through to Market Rates and the Yield Curve

The first stage is to a large extent influenced by the stability of the yield curve: If the term structure, whatever its form may be (negative or positive sloping), remains stable over time, the pass-through from policy rates to market rates is said to be proportionate.<sup>5</sup> However, any twist in the yield curve can change the size of the pass-through.

The form of the yield curve is essentially determined by four factors. First, the liquidity structure of different maturities implies that longer-term investments are generally less liquid. Consequently, investors demand a higher liquidity premium, which leads to higher long-term rates. Second, it is possible that short-term and long-term interest rates are determined independently in segmented markets (market segmentation). Third, long-term interest rates can be computed as the average of expected future short-term interest rates (expectation channel), which are closely related to inflation expectations. A change in any of the aforementioned three factors modifies the slope and the specific shape of the yield curve, thus possibly dampening or strengthening the interest rate pass-through. Especially expectations are viewed to be a major factor in causing changes in the yield curve.<sup>6</sup> Finally, expectations of future exchange rate changes may influence the shape and dynamics of the yield

<sup>4</sup> In this paper, Austria, Germany and Spain represent small open economies, large core countries and catching-up countries, respectively.

<sup>5</sup> In this case, changes in the policy rate will lead to a shift in the yield curve.

<sup>6</sup> The impact of a given rise in the monetary policy rate on the longer end of the maturity spectrum depends on whether or not the policy rate hike is in line with market expectations with respect to future inflation. If this rise is smaller than anticipated, long-term rates will increase owing to higher expected future short-term rates. Conversely, if it is above expectations, long-term rates will drop. Finally, long-term rates will remain unchanged, if inflation is expected not to change in the aftermath of the interest rate hike.

curve, in particular in a setting with strong participation of foreign portfolio investors in the domestic capital markets, which may vary across the maturity segments.

## 2.2 Pass-Through to Retail Rates: Cost of Funds and Monetary Policy Approach

The *cost of funds approach* (DeBondt, 2005) is the best way to describe the second stage of the interest rate pass-through, i.e. the connection between market rates on the one hand, and bank deposit and lending rates of comparable maturity on the other hand.

In general, several factors make sure that market rates are passed on to retail rates. For loan rates, the link to market rates is secured by the fact that banks rely on the money market to fund (short-term) lending. This is in the same vein that deposit rates, which represent the cost of loans, should be reflected in loan rates.<sup>7</sup> At the same time, yields on government securities can be viewed as opportunity costs for banks. This helps maintain the link between, for instance, government bond yields and loan rates of longer maturity.

The connection between market rates and deposit rates is warranted by the possibility that households and the nonfinancial corporate sector can hold their financial assets not only in bank deposits, but also in government securities of comparable maturity. In addition, banks can rely on the money market instead of deposits for funding loans, which can also lead to an equalization of deposit and money market rates.

The pass-through from market rates to retail rates is, however, not necessarily proportionate. If the elasticity of demand for deposits and for loans to the deposit and the lending rate, respectively, is lower than 1, the pass-through may become disproportionate. Imperfect substitution between bank deposits and other money market instruments of the same maturity (e.g. money market funds or T-bills) and between bank lending and other types of external finance (equity or bond markets) may cause demand elasticity to be lower than unity. Weak competition within the banking sector (i.e. among banks) and in the financial sector (i.e. between banks and nonbank financial intermediaries) reduces the sensitivity of the demand for deposits and loans to the interest rate.<sup>8</sup> High switching costs may also lead to lower demand elasticity.<sup>9</sup>

Macroeconomic conditions influence the size of the pass-through, too. It is generally observed that during periods of rapid economic growth, it is easier for banks to pass on changes in the interest rate to their lending and deposit rates faster. Higher inflation rates also favor more complete and more rapid

<sup>7</sup> Provided that the volatility of the credit risk premium embedded in loan rates is stable over time.

<sup>8</sup> The competition effect is more important for deposit rates than for lending rates, given that the former are less affected by asymmetric information problems (Sander and Kleimeier, 2004a).

<sup>9</sup> The pass-through can also be amplified, i.e. be higher than unity, if banks charge higher interest rates in an attempt to offset the higher risks resulting from asymmetric information (adverse selection and moral hazard) rather than reducing the supply of loans (DeBondt, 2005). An increase in the general interest rate level raises the average burden of interest payments and thus necessitates an upward adjustment of the risk premium for asymmetric information. The same argument applies to small banks: they find it more difficult to obtain external financing owing to asymmetric information problems. This is why they have to pay a risk premium on their deposit rates to attract sufficient amounts of deposits; consequently, they also require a premium on their lending rates (Gambacorta, 2004).

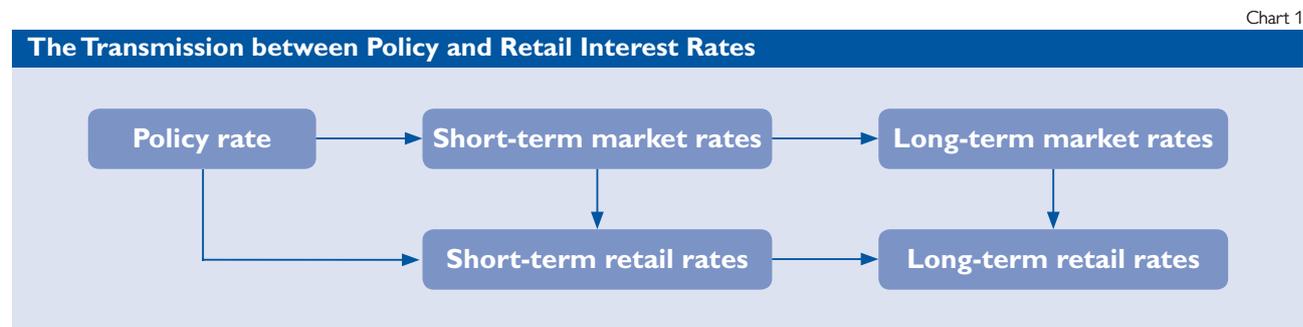
interest rate pass-through, given that prices may be adjusted more frequently in a double-digit or high inflation environment. By contrast, higher interest rate volatility (mirroring higher macroeconomic instability and uncertainty) weakens the interest rate pass-through, given that banks wait longer before changing their rates.

The pass-through can be not only incomplete in the long run, but also sluggish in the short run. The reasons for this are manifold: First, adjustment or menu costs can cause banks to react sluggishly to changes in the market rates. Second, the maturity mismatch of banks' loan and deposit portfolios influences the way in which they adjust their lending rates.<sup>10</sup> The more long-term loans are covered by long-term deposits, the less pressure banks feel to adjust their lending rates, since their liabilities are less sensitive to market rates (Weth, 2002). Finally, given the long-term relationships of banks (especially universal banks) with their customers, they may want to smooth interest rate changes.

The assumption of a stable yield curve makes it possible to take a shortcut by looking directly at the relationship between policy rates and retail (deposit and loan) rates. This approach is referred to as the monetary policy approach (Sander and Kleimeier, 2004a).

### 2.3 Testable Relationships

The alternative transmission routes from policy rates to retail rates and the ensuing empirically testable relationships are shown in chart 1 and table 1 below.



Source: Authors.

We set out to answer an array of questions relating to the interest rate pass-through on the basis of the testable relationships shown in table 1. First, is the transmission from the monetary policy rate via market rates to retail rates proportionate in the long run? That is, is there a one-to-one reaction of market rates and, consequently, retail rates to changes in key policy rates? Second, is the pass-through different in different segments of the same economy (households vs. nonfinancial corporate sector or short term vs. long term)? Third, is there evidence of convergence or divergence across countries and over time?

<sup>10</sup> Note that maturity in this context refers to the period of interest rate fixation (i.e. the interval between the adjustment dates of interest rates of a loan or deposit contract), not to the duration of the loan or deposit contract between initial payment and full repayment.

In particular, how does the pass-through in the CEE-5 compare with that in the euro area? Finally, does the direction of a change in the monetary policy rate (increase or decrease) have an impact on the short-term adjustment?

Table 1

### Testable Relationships

#### Monetary Policy Approach

Policy rate → short-term/long-term deposit rate

Policy rate → short-term/long-term lending rate

#### Cost of Funds Approach

1<sup>st</sup> stage: yield curve

policy rate → 1m MMR → 12m MMR/T-bill rate → government bond rate

2<sup>nd</sup> stage: cost of funds

a) 1m MMR / 12m T-bill/MMR → short-term deposit rate → short-term loans (long-term loan rate)

b) 1m MMR / 12m T-bill/MMR → short-term loan rate (long-term loan rate)

c) government bond rate → long-term deposit rate → long-term loan rate

d) government bond rate → long-term loan rate

Source: Authors.

### 3 Data Issues

Our dataset covers the CEE-5 (the Czech Republic, Hungary, Poland, Slovakia and Slovenia) and three euro area countries (Austria, Germany and Spain). The monthly data series include short-term market rates, i.e. (annualized) 1-month money market rates (MMR), and 12-month T-bill rates (if not available, 12-month MMR), long-term market rates, i.e. 3- to 5-year government bond yields, as well as economy-wide and sectoral retail rates (households and nonfinancial corporate sector) of different maturity (overnight rates, short- and long-term rates). For the Czech Republic, Hungary, Poland, Austria and Germany, these data are primarily obtained from the national central banks and the ministries of finance. For Slovakia, Slovenia and Spain, the main data source is NewCronos (Eurostat). Some of the market rates are drawn from Datastream and Bloomberg, if they were not available from national sources or from Eurostat. Whenever possible, the lending rate series for households are split into housing and consumer loans. The time series start in January 1994 at the earliest for the CEE-5 and usually end in end-2005. Appendix 1 provides a detailed description of the data and data sources.

Furthermore, we distinguished between retail rates on the stock of deposits/loans and those applied to newly collected deposits/newly extended loans. This is important because the (weighted) average interest rates on outstanding deposits and loans (which include contracts with fixed rates and contracts with variable rates that are adjusted at a later stage) may react more slowly than the interest rates of new deposits and loans. The maturity of the series is another important issue. In conventional interest rate statistics, maturity refers to the duration of the loan or deposit contract, not to the period of interest rate fixation. In the new harmonized interest statistics developed in the euro area and in new EU Member States, however, maturity refers to the period of interest

rate fixation. However, most of those series start as late as 2003, with the exception of the lending rate time series for Austria.<sup>11</sup>

We constructed another database that includes interest rate series obtained from the International Monetary Fund's International Financial Statistics (IFS): discount rates (line 60), money market rates (line 60b), T-bill rates (line 60c), deposit rates (line 60l), lending rates (line 60p) and government bond yields (line 61). The series usually cover the period 1991–2005. They are constructed using data series compiled on the basis of different methodologies (which explains their length for transition economies) and do not distinguish between different maturities.<sup>12</sup> Hence, it is interesting to see whether or not the results differ for our two datasets.

## 4 Estimation Techniques

### 4.1 Single-Equation Approach

The empirical literature concerned with analyzing the interest rate pass-through usually relies on generalizations of the following error correction model:

$$\Delta i_t^R = \mu + \rho(i_{t-1}^R - \mu - \beta i_{t-1}^P) + \delta \Delta i_t^P + \varepsilon_t \quad (1)$$

where  $i_t^R$  and  $i_t^P$  are the retail (or market) rate and the monetary policy rate, respectively.  $\mu$  and  $\varepsilon_t$  denote the constant term and the residuals, respectively.  $\beta$  stands for the long-run pass-through, which can be obtained by means of a simple Ordinary Least Squares (OLS) estimate or a Dynamic Ordinary Least Squares (DOLS) estimate as proposed by Stock and Watson (1993), which accounts for the potential endogeneity of the monetary policy rate by incorporating leads and lags in first differences of the regressor. The DOLS estimate is thus obtained from the regression

$$i_t^R = \mu + \beta \cdot i_t^P + \sum_{j=-k_1}^{k_2} \gamma_j \Delta i_{t-j}^P + \varepsilon_t \quad (2)$$

where  $k_1$  and  $k_2$  denote leads and lags, respectively. Equation (1) can be

<sup>11</sup> The following abbreviations were used for market rates: mp – monetary policy rate, mmr – 1-month money market rate; T-bill – 12-month treasury bill rate, mmr12 – 12-month money market rate if no T-bill rate is available, gbond – government bond rate.

The information on retail rates is composed of three main blocks (e.g. lh\_hh\_11y\_s). The first block indicates the type of interest rate: l – lending rate, d – deposit rate, f – nonfinancial corporate sector (firms) (lf or df), h – aggregate household loans (dh, lh), hh – housing loan to households, hc – consumer credit to households. The second block denotes the maturity of the series: on – overnight, 11y – less than one year, m1y – more than one year, 1m, 3m – one month, three months; 1y, 3y, 4y – one year, three years, four years, 1y5y – 1 to 5 years, st – short-term, lt – long-term (if the source does not specify the precise maturity). No indication of maturity means that the series covers all maturities. The third block covers two types of information: (1) It may be n or s (n – new loans or deposits; s – stock of deposits or loans). A missing n or s at the end of the label indicates aggregated data for new and old loans (deposits) or simply reflects the lack of specification by the data source. (2) For German deposit rates, a difference is made between interest rates for low-, medium- and high-amount deposits: la, ma, ha (e.g. d\_1m\_la, d\_1m\_ma, d\_1m\_ha). For Austria, similar information is included in the second block: e.g. lf\_11y1M\_n refers to the rates for corporate loans exceeding EUR 1 million, while lf\_11y\_n stands for the same type of loan below or equal to EUR 1 million.

<sup>12</sup> The IFS manual remains very vague about the exact definition of the series e.g. regarding maturity.

extended to the error correction form of a general Autoregressive Distributed Lag (ARDL) model to account for more short-term dynamics:

$$\Delta i_t^R = \mu + \rho(i_{t-1}^R - \mu - \beta i_{t-1}^P) + \sum_{j=0}^l \delta_j \Delta i_{t-j}^P + \sum_{j=1}^m \phi_j \Delta i_{t-j}^R + \varepsilon_t \quad (3)$$

The long-term parameter  $\beta$  in equation (3) can be derived by estimating a standard ARDL model as suggested by Wickens and Breusch (1988),

$$i_t^R = \mu + \sum_{j=0}^p \delta_j i_{t-j}^P + \sum_{j=1}^q \phi_j i_{t-j}^R + \varepsilon_t \quad (4)$$

where the long-run elasticity can be obtained as  $\beta = \sum_{j=0}^l \delta_j / (1 - \sum_{j=1}^l \phi_j)$ .

The cointegration of the monetary policy rate ( $i^P$ ) with retail rates ( $i^R$ ), i.e. whether or not they are linked in the long run, can be assessed by relying either on residual-based cointegration tests (Engle and Granger, 1987) or on the bounds testing approach (Pesaran, Shin and Smith, 2001).

According to residual-based cointegration tests, the two variables are cointegrated if the residuals from the long-run relationship

$$i_t^R = \mu + \beta i_t^P + \varepsilon_t \quad (5)$$

are stationary, where  $\beta$  is obtained as described above (OLS, DOLS and/or ARDL).

The bounds testing approach uses F-tests for the parameters in equation (3): the null given by  $H_0 : \rho = \beta = 0$  is tested against the alternative of  $H_1 : \rho \neq \beta \neq 0$ . Two sets of critical values are provided: one for the case when all variables are I(1), i.e. upper-bound critical values, and another one for when all variables are I(0), i.e. lower-bound critical values. If the test statistic is higher than the upper-bound critical value, the null of no cointegration is rejected, whereas an F-statistic lower than the lower-bound critical value does not permit the rejection of the null of no cointegration.

One can hypothesize that a) the speed of adjustment ( $\rho$ ) to the long-run relationship and b) the short-term dynamics ( $\delta_j$  and  $\phi_j$ ) in equation (3) are different depending on whether the monetary policy rate increases or decreases, which leads to the following specification:

$$\begin{aligned} \Delta i_t^R = & I(\Delta i_{t-1}^P < 0) \left[ \mu_1 + \rho_1(i_{t-1}^R - \mu - \beta i_{t-1}^P) + \sum_{j=0}^l \delta_j \Delta i_{t-j}^P + \sum_{j=1}^m \phi_j \Delta i_{t-j}^R \right] + \\ & + [1 - I(\Delta i_{t-1}^P < 0)] \left[ \mu_2 + \rho_2(i_{t-1}^R - \mu - \beta i_{t-1}^P) + \sum_{j=0}^l \psi_j \Delta i_{t-j}^P + \sum_{j=1}^m \zeta_j \Delta i_{t-j}^R \right] + \varepsilon_t. \end{aligned} \quad (6)$$

where  $I(\bullet)$  is an indicator function taking the value 1 if the argument is true and zero otherwise. A simple test for symmetry is then given by the F-test for the following restrictions:  $\rho_1 = \rho_2$ ;  $\delta_j = \psi_j$ ;  $\phi_j = \zeta_j$  for all  $j$ . A rejection of the null indicates that there is asymmetry in the speed of adjustment and/or in the

short-term dynamics depending on the direction of the change in the policy rate. We test both separately and jointly for the two types of asymmetries.<sup>13</sup>

## 4.2 Multivariate Approach

Having established the direct link between the policy rate and diverse market and retail rates with the single-equation approaches described above, we study the chains of this transmission. From this perspective, the interest rate pass-through can be viewed as a chain of pairwise links: policy rate – 1m MMR; 1m MMR – 12m T-bill/MMR rate; 12m T-bill/MMR rate – government bond yield – long-term deposit rate – long-term lending rate (see table 1). Using a cointegrated VAR framework (Johansen, 1995) makes it possible to analyze the many pairwise relationships in a single system. Considering vector  $Y_t$  to contain a set of interest rates (e.g.  $Y_t = [i^P, i^{MS}, i^{ML}, i^D, i^L]$ , with P, MS, ML, D and L referring to monetary policy rate, short-term market rate, long-term market rate, deposit rate and lending rate, respectively), we estimate the following system:

$$\Delta Y_t = \sum_{i=1}^{k-1} \phi_i \Delta Y_{t-i} + (\mu_0 + \alpha \beta' \cdot Y_{t-1}) + \varepsilon_t \quad (7)$$

where  $\alpha$  and  $\beta$  are  $n \times r$  matrices,  $r$  denotes the cointegration rank of the system and  $n$  represents the number of endogenous variables.  $\alpha$  stands for the adjustment matrix,  $\beta$  is a matrix that contains the cointegrating vectors and  $k$  denotes the lag length. We assume that the cointegration space contains only a constant term ( $\mu_0$ ) but no trend.

Full-fledged transmission from policy to retail rates would imply that there would be 4 cointegration relationships in the presence of 5 interest rate series, so that the cointegrating space is given by:

$$\begin{array}{l} \begin{array}{c} i^P \\ i^{MS} \\ i^{ML} \\ i^D \\ i^L \\ const \end{array} \begin{array}{c} i^{MS} \quad i^{ML} \quad i^D \quad i^L \\ \left[ \begin{array}{cccc} \beta_1 & 0 & 0 & 0 \\ 1 & \beta_2 & 0 & 0 \\ 0 & 1 & \beta_3 & 0 \\ 0 & 0 & 1 & \beta_4 \\ 0 & 0 & 0 & 1 \\ c_1 & c_2 & c_3 & c_4 \end{array} \right] \end{array} \quad \text{implying} \quad \begin{array}{l} i^{MS} = c_1 + \beta_1 i^P + \varepsilon \\ i^{ML} = c_2 + \beta_2 i^{MS} + \varepsilon \\ i^D = c_3 + \beta_3 i^{ML} + \varepsilon \\ i^L = c_4 + \beta_4 i^D + \varepsilon \end{array} \end{array} \quad (8)$$

In other words,  $i^P$  would be connected to  $i^L$  via the four pairwise long-term cointegration relationships. However, whether or not there is a propor-

<sup>13</sup> Whether the asymmetric behavior of the market rate is attributable to the deviation from the long-run equilibrium or to the direction of change in the policy rate depends on the definition of asymmetry one wants to test for. In line with the cost of funds approach (DeBondt 2005), we interpret changes in the policy rate as cost shocks to private banks. Thus, it is, *inter alia*, the degree of competition among banks which determines whether a change in costs can be passed on to the corresponding price (the retail interest rate) and whether or not that response will be symmetric with respect to the direction of the change in the policy rate. The latter (i.e. the existence of a negative or positive cost shock) seems to be the relevant variable for this interpretation, since the deviation from the long-run equilibrium need not be a valid proxy for cost of funds-related shocks.

tionate pass-through from  $i^P$  to  $i^L$  largely depends on the size of the long-term beta coefficients ( $pass - through = \beta_1 \cdot \beta_2 \cdot \beta_3 \cdot \beta_4$ ).

However, in practice, the pass-through may be incomplete in system (8), because the pass-through from the long-term market rate to retail rates may be ineffective, if the yield curve is not stable and/or because the funding of bank lending relies on shorter-term market rates<sup>14</sup> instead of bank deposits/long-term market rates. For instance, if we find 3 cointegrating vectors instead of the 4 required for full pass-through, we estimate a system in which the following cointegrating vectors are assumed  $(i^P, i^{MS}); (i^{MS}, i^D); (i^D, i^L)$ . If the relationship between deposit and lending rates is not robust, we assume that both deposit and lending rates are connected to short-term market rates:  $(i^P, i^{MS}); (i^{MS}, i^D); (i^{MS}, i^L)$ .

## 5 Results

### 5.1 Cointegration Results

The fact that all interest rate series turn out to be well-represented by I(1) processes for the periods under review<sup>15</sup> justifies the use of the cointegration techniques to determine the size of, and the mechanism underlying, the interest rate pass-through.

In a first step, all market and retail interest rate series are regressed on the monetary policy rate for the whole period and for two subperiods.<sup>16</sup> For the CEE-5, the first subperiod ends in 2000:12 and the second subperiod starts in 2001:01,<sup>17</sup> while for Germany and Spain, the dividing line is 1998:12 and 1999:01.<sup>18</sup> The rationale behind splitting the sample into subsamples is to check for major changes in the pass-through over time. Dividing the sample period in 1998–1999 for Germany and Spain kills two birds with one stone: we are able to study not only the time effect, but also the impact of the launch of the euro.<sup>19</sup>

<sup>14</sup> E.g. as a result of interest rate swaps.

<sup>15</sup> Standard unit root and stationarity tests, such as the augmented Dickey-Fuller (ADF), Phillips-Perron (PP) and the Elliott-Lothberg-Stock (ERS) point optimal unit root tests as well as the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) stationarity test, are employed for level data and for first and second differences. While most test results show unanimously that the series are I(1) processes, some tests provide conflicting results for level data. However, since they never indicate unambiguously that the series are stationary in level, we conclude that these series are I(1). The test results are available from the authors upon request.

<sup>16</sup> We use the Schwarz information criterion to select the lag length in the DOLS and ARDL approaches, setting the maximum number of lags to 6.

<sup>17</sup> We split the sample period in 2000:12 and 2001:01, because interest rate series disaggregated by sectors (households, nonfinancial corporate sector) for the Czech Republic are available from 2001:01. Dividing the series at the same point in time for the other countries secures a higher level of cross-country comparability.

<sup>18</sup> For Austria, we considered only two periods (1996–2005 and 1999–2005), given that the series start in 1996.

<sup>19</sup> At first glance, the subperiods might seem too short for cointegration analysis. However, contrary e.g. to business cycle analysis (which requires data spanning at least 10 years to cover the whole cycle), interest rate data adjustment in the pass-through context tends to take place much faster. We have 50–60 observations for the subperiods; from an econometric viewpoint, 100–120 observations would be required. Still, the fact that we could not establish cointegration does not necessarily reflect the low power of the tests. Instead, it suggests that such cointegrating vectors are actually absent, given that it is sometimes difficult to find cointegration even for the whole sample. An alternative approach in these cases would be to use panel cointegration. Even though these tests might have some advantages over time series analysis, they are clearly inappropriate to study the cross-country differences in the interest rate pass-through we are interested in.

We carry out four cointegration tests: two residual-based tests for the OLS/DOLS estimates,<sup>20</sup> one residual-based test and the bounds testing approach for the long-term relationship obtained from with the ARDL model. If at least three of the four test statistics support the presence of cointegration, we will consider that to be robust evidence for cointegration between the policy rate and any given interest rate series.<sup>21</sup>

The most remarkable feature of the results is the absence of cointegration for a large number of interest rate series. The most striking case is that of Germany, where cointegration could be established only for three series (1-month MMR and two 1-month deposit series). In Spain, the short-term money market rate as well as the rates on aggregate household loans and on housing loans appear to have a stable long-run relationship with the policy rate in all three periods.<sup>22</sup> In addition, the short- and long-term corporate lending rates become cointegrated with the policy rate after 1998, while the relationship for deposit rates breaks down over time. In Austria, the stability of the long-run relationship improves markedly after the introduction of the euro. In the second subperiod, the short-term money market rate, the overnight (household and corporate) deposit rates, the long-term household deposit rates and the long-term consumer lending rates become cointegrated with the policy rate, while only long-term corporate deposit rates are cointegrated during the whole period.

The picture is not much rosier for the CEE-5. The results for 1-month MMR and 12-month MMR/T-bill rates suggest stable cointegration with the policy rate in the Czech Republic and Hungary over the entire period under review, and in Slovakia for the subperiod 2001–2005. While short-term money market rates are linked via a cointegrating vector to the policy rate in Poland in all periods, long-term market rates are linked only in the Czech Republic and perhaps also in Hungary.

Regarding retail rates, the number of cointegrating relationships for retail rates decreases from the first to the second subperiod in Hungary, whereas it increases significantly in Poland and Slovenia. The number of statistically significant long-run relationships is relatively stable over time in the Czech Republic and Slovakia. The difficulty of establishing cointegrating relationships is also supported by estimation results obtained for the IFS dataset.<sup>23</sup>

Addressing asymmetries in the adjustment to the long-run relationship and in short-run dynamics is only meaningful when cointegration is detected. The results summarized in tables 2a and 2b indicate some common features. First, asymmetry is detected for the 1-month MMR in six out of eight countries in the second subperiod. Second, more asymmetries are observed in the second subperiod. Third, asymmetry is usually present both for the adjustment to the long-run relationship and in short-run dynamics. However, there is no com-

<sup>20</sup> Stationarity of the residuals is checked for the long-run coefficients obtained from a simple OLS regression and from DOLS estimations.

<sup>21</sup> These results are not explicitly reported in the paper owing to space constraints. However, they are available from the authors upon request. The shaded cells in tables 2a and 2b indicate the presence of cointegration, while white cells show that the tests failed to establish cointegration.

<sup>22</sup> It should be noted that the error correction terms are always statistically significant and have the expected negative sign when cointegration could be established. This is in line with Granger's representation theorem. However, in a number of cases, no cointegration was found despite a significantly negative error correction term.

<sup>23</sup> These data are not reported here, but are available from the authors upon request.

mon pattern in the type of retail rates affected by asymmetry. While it only concerns deposit rates in the Czech Republic, Poland and Germany, asymmetry is characteristic of lending rates in Spain and occurs both for deposit and lending rates in Hungary and Slovakia. Slovenia and especially Austria stand out as the most “symmetric” countries in our sample.

## 5.2 Size of the Pass-Through

In the analysis of the size of the interest rate pass-through, we consider the long-run pass-through coefficient ( $\beta$ ) for cases when cointegration could be established with confidence. In these cases, the size of the pass-through is obtained using the DOLS and ARDL models presented in equations (2) and (4). Otherwise, we used coefficient estimates from a simple OLS run for first-differenced variables (see tables 2a and 2b). It turns out that, even though the cointegration tests failed to detect long-run relationships between the policy rate and a number of interest rates, the coefficient estimates obtained for series taken in first differences provided us with an opportunity to estimate the pass-through coefficient after all, as they are very often significant and have the expected positive sign.

Let us start with the connection between the policy rate and short- to long-term market rates. It comes as no real surprise that the pass-through from the policy rate to 1-month MMR is not significantly different from 1 for practically all countries and periods. The only exception is Slovakia with an insignificant pass-through coefficient in the first subperiod turning into a significant coefficient of 0.9. In the Czech Republic, the pass-through to 12-month MMR/T-bill rates is nearly complete and in Hungary it is high (albeit declining) with around 85%. A similarly high pass-through emerges for Slovakia for the period 2001–2005. In Poland and Germany, the pass-through drops considerably from about 70% to nearly 40% and 35%, respectively. In Austria and Spain, the size of the pass-through is modest between 30% and 40%.

The pass-through to the long-term market rate (government bonds) drops from high levels in the first subperiod to between 40% and 50% in the second subperiod in the Czech Republic and Hungary and becomes insignificant for Poland and the three euro area countries. For transition economies, this is to be expected, since the yield curve at the longer end changed considerably for these economies owing to successful attempts to decrease in inflation rates.<sup>24</sup>

With regard to deposit rates, our results demonstrate that the pass-through for overnight (O/N) deposit rates ranges from 10% in Hungary to between 15% and 25% in the Czech Republic, Austria, Germany and Spain, while coming to between 35% and 55% in Poland and Slovakia in the second subperiod. In those countries where sectoral data for O/N deposit rates are available (the Czech Republic, Poland and Austria), a major difference is found only in Poland (higher pass-through for households).

<sup>24</sup> For countries which embarked on a prolonged period of disinflation (e.g. Hungary and Poland), the long-term market rates declined below the level of short-term rates once the market participants were convinced of the steady decrease in inflation rates. However, the negative slope of the yield curve decreased substantially toward the end of disinflation, given the limited room for large drops in future inflation rates. Thus, further cuts in monetary policy rates could not cause long-term market rates to drop to the same extent. As inflation rates stabilized, with disinflation reaching an end, the yield curve eventually flattened out or its slope even became positive.

These figures for the O/N deposit rates are considerably lower than the pass-through coefficients of short- to long-term deposit rates in all countries, except for Slovakia and Slovenia, where the pass-through coefficients for the latter are not significantly different from zero. The pass-through is typically high for short-term deposits in Germany and for both short- and long-term deposits in the Czech Republic, Hungary and Poland. It is almost complete for corporate deposits in Hungary. In the Czech Republic and in Hungary, the pass-through in this segment of the corporate sector is found to be usually higher than that for households, while the results are mixed for Poland. In addition, and not astonishingly, changes in the policy rate feed into new deposit rates to a larger extent than into the rates on outstanding deposits (Hungary). Deposit rates for large amounts are more responsive to policy rates than those for small amounts (Germany). In Austria and Spain, the pass-through to short- and long-term rates reaches 60% and 40%, respectively, with the coefficients being higher for households than for the corporate sector in Austria. Regarding the development of the pass-through to deposit rates over time, the results reveal that it remained fairly stable for most countries, with the notable exceptions of Hungary, Poland and Spain, where the pass-through increased for O/N deposit rates (all three countries), for short-term deposit rates (Spain) and for household rates (Poland). In Austria, the coefficients for O/N deposit rates and for long-term household deposit rates became higher over time.

Finally, it is worthwhile taking a closer look at lending rates, which seem to offer us a so far unseen colorful picture. In general, lending rates for households turn out to react less, if at all, to monetary policy rates as compared with lending rates for the corporate sector. No significant or economically meaningful pass-through could be detected for the interest rates on aggregate household lending in the Czech Republic and Slovakia, on consumer lending in Slovakia, on new long-term consumer loans and new housing loans in Hungary, and on housing loans (all maturities) in Germany. Moreover, the pass-through for rates on outstanding housing loans in Hungary and on new housing loans in Austria is only around 20%. The insensitivity of housing loan rates may reflect the impact of public subsidy schemes in Austria, Germany and Hungary. By contrast, the pass-through for housing loan rates in Slovenia and in Spain is almost complete, although it has declined in Spain.

In Germany, consumer loan rates react little to monetary policy rates (15%). In Austria, the pass-through is small for new short-term consumer loan rates (25%–30%) but complete for new long-term consumer loan rates, while in Slovenia, it amounts to above 70% for consumer loan rates. In Hungary, it comes to almost 60% for new short-term consumer loans and to roughly 40% for the stock of these loans. This is in sharp contrast with the finding that the pass-through is zero for new long-term consumer loans in Hungary. Regarding the development of the pass-through to household lending rates over time, the long-run coefficients in the second subperiod were partly (Austria, Germany, Hungary) similar to and partly (Poland, Spain) lower than the coefficients in the first subperiod and/or the whole period. Only in Slovenia did the size of the coefficient increase.

In the CEE-5 and in Spain, corporate loan rates are generally very responsive to monetary policy rate changes, with the pass-through estimate ranging

from 50% for Poland to 100% for the Czech Republic, Hungary, Slovakia, Slovenia (with the exception of short-term rates) and Spain. In Germany, by contrast, a 1% change in the policy rate generates only a 0.2% to 0.3% change or even no significant reaction in corporate loan rates. Austria is located between the two extremes.

Table 2a

Interest Rate Pass-Through – Market Rates									
	Whole period			1 <sup>st</sup> subperiod			2 <sup>nd</sup> subperiod		
	DOLS/1 <sup>st</sup> d	ARDL	AS	DOLS/1 <sup>st</sup> d	ARDL	AS	DOLS/1 <sup>st</sup> d	ARDL	AS
<b>CEE-5</b>									
<b>Czech Republic</b>									
	1995:12 – 2005:12			1995:12 – 2000:12			2001:1 – 2005:12		
MMR	1.08**	1.07**		1.11**	1.08**		1.01**	1.01**	C
MMR 12	0.95**	0.91**	C	0.89**	0.82**	C	1.01**	0.95**	C
G-bond	0.78**	0.64**	C	0.65**	0.55**		0.43**		
<b>Hungary</b>									
	1995:9 / 1997:3 – 2005:12			1995:9 / 1997:3 – 2000:12			2001:1 – 2005:12		
MMR	0.99**	1.01**	C	1.01**	1.01**		1.03**	1.04**	C
T-bill	0.99**	0.95**	C	1.01***			0.88**	0.85**	
G-bond	0.61***			0.84**	0.97**	C	0.48***		
<b>Poland</b>									
	1996:12 / 1998:7 – 2005:12			1996:12 – 2000:12			2001:1 – 2005:12		
MMR	1.05**	1.05**	C	1.06**	1.06**	B	1.02**	1.02**	C
T-bill	0.93**	0.90**		0.66***			0.40***		
G-bond	0.37***			0.46**			0.15		
<b>Slovakia</b>									
	1994:1 – 2002:12			1998:7 – 2004:12			2001:1 – 2004:12		
MMR	0.04			0.02			0.84**	0.89**	C
MMR 12	0.28			-0.14			0.95**	0.94**	C
<b>Euro area</b>									
<b>Austria</b>									
	1996:6 – 2005:11						1999:1 / 1999:6 – 2005:11		
MMR	0.66***			NA	NA	NA	1.01**	0.99**	C
MMR 12	0.44***			NA	NA	NA	0.36***		
G-bond	0.20*			NA	NA	NA	0.14		
<b>Germany</b>									
	1992:11 – 2003:6			1992:11 – 1998:12			1999:1 – 2003:6		
MMR	1.01**	1.00**		1.00**	1.00**	C	1.00**	0.98**	C
MMR 12	0.49***			0.68***			0.35***		
G-bond	0.18*			0.31*			0.87		
<b>Spain</b>									
	1992:11 – 2003:6			1992:11 – 1998:6			1999:1 – 2003:6		
MMR	1.03**	1.02**	C	1.04**	1.01**	C	0.98**	0.96**	
MMR 12	0.38***			0.35**			0.31*		
Swap 5y	0.31**			0.29*			0.07		

Source: Authors.

Note: Shaded cells refer to the existence of cointegrating relationships and contain the estimated long-run elasticities (DOLS and ARDL). Nonshaded cells in the "DOLS/1<sup>st</sup> d" column report the coefficients obtained from first-differenced specifications. The AS column shows the type of asymmetry: A: asymmetry in the adjustment to the long-run equilibrium, B: asymmetry in short-run dynamics, C: both A and B. \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% levels, respectively. NA = data not available for the period under review.

These results should be regarded with some qualification. First, the pass-through for short-term corporate loan rates in Hungary, Austria and Spain seems to be more pronounced than for long-term corporate loan rates. At the same time, no similar pattern emerges for Germany, and the opposite holds true in Slovakia and to some extent also in the Czech Republic and in Slovenia. Second, while pass-through is complete for the rates on new loans, it vanishes completely for the rates on the outstanding stock of loans in Slovakia. Third, the rates on large amount loans exhibit higher pass-through in Austria, similar

Table 2b

**Interest Rate Pass-Through – Deposit Rates**

	Whole period			1 <sup>st</sup> subperiod			2 <sup>nd</sup> subperiod		
	DOLS/1 <sup>st</sup> d	ARDL	AS	DOLS/1 <sup>st</sup> d	ARDL	AS	DOLS/1 <sup>st</sup> d	ARDL	AS
<b>Overall deposits</b>									
<b>CEE-5</b>									
<b>Czech Republic</b>									
	1995:12 – 2005:12			1995:12 – 2000:12			2001:1 – 2005:12		
d_on_s	0			0			0.20***		
d_1y_s	0.79**	0.74**	C	0.74**	0.66**		0.80**	0.79**	C
d_lt_s	0.71**	0.6**	C	0.68**	0.57**	C	0.59***		
<b>Poland</b>									
	1996:12 / 1998:7 – 2005:12			1996:12 – 2000:12			2001:1 – 2005:12		
d_on_n	0.39***			NA	NA	NA	0.40***		
<b>Slovakia</b>									
	1994:1 – 2002:12			1998:7 – 2004:12			2001:1 – 2004:12		
d_on_s	NA	NA	NA	0.06			0.33**	0.33**	B
d_1y	0.14			0.22			0.3		
<b>Slovenia</b>									
	1994:1 – 2002:8			1998:7 – 2005:11			2001:1 – 2005:11		
d_on_n	NA	NA	NA	0			0		
d_1y	2.32**	1.57*							
d_m1y	NA	NA	NA	0.00			0.1		
<b>Euro area</b>									
<b>Germany</b>									
	1992:11 – 2003:6			1992:11 – 1998:12			1999:1 – 2003:6		
d_1m_la	0.42***			0.75**	0.73**		0.43***		
d_1m_ma	0.46***			0.81**	0.80**		0.80**	0.79**	C
d_1m_ha	0.90**	0.91**	C	0.90**	0.89**	B	0.88**	0.87**	
d_3m	NA	NA	NA	NA	NA	NA	0.46***		
d_1y	0.83**	0.83**	C	0.83**	0.83**		0.46***		
d_4y	0.29***			0.27**			0.29***		
<b>Spain</b>									
	1992:11 – 2003:6			1992:11 – 1998:6			1999:1 – 2003:6		
d_on	0.14**			0.09**			0.20***		
d_1y	0.97**	0.91**		0.32***			0.41***		
d_other	0.74**	0.69**	C	0.75**	0.77**	C	0.32***		
<b>Household deposits</b>									
<b>CEE-5</b>									
<b>Czech Republic</b>									
	1995:12 – 2005:12			1995:12 – 2000:12			2001:1 – 2005:12		
dh_on_s	NA	NA	NA	NA	NA	NA	0.16***		
dh_lt_s	NA	NA	NA	NA	NA	NA	0.50**	0.42**	C
<b>Hungary</b>									
	1995:1 – 2005:12			1995:1 – 2000:12			2001:1 / 2001:5 – 2005:12		
dh_on_n	0,1			0,0			0.11**		
dh_on_s	0.16***			0.08*			0.12**		
dh_1y_n	0.77**	0.81**	C	0.90**	0.85**		0.73***		
dh_1y_s	NA	NA	NA	NA	NA	NA	0.53***		
dh_m1y_n	0.92**	0.91**	C	0.95**	0.93**		0.52***		
dh_m2y_n	NA	NA	NA	NA	NA	NA	0.59***		
dh_m2y_s	NA	NA	NA	NA	NA	NA	0.33***		
dh_lt_n	0.78**	0.81**	C	0.90**	0.86**		0.72***		
dh_lt_s	0.78**	0.81**	C	0.92**	0.86**		0.52***		
<b>Poland</b>									
	1996:12 / 1998:7 – 2005:12			1996:12 – 2000:12			2001:1 – 2005:12		
dh_on_s	0.34***			0.32***			0.57**	0.46**	C
dh_1y_s	0.74***			0.70***			0.82**	0.77**	C
dh_m1y_s	0.92**	0.92**		0.74***			0.77***		
dh_lt_s	0.71***			0.70***			0.82**	0.77**	
<b>Euro area</b>									
<b>Austria</b>									
	1996:6 – 2005:11			1999:1 / 1999:6 – 2005:11					
dh_on_s	0.13***			NA	NA	NA	0.23**	0.21**	
dh_1y_n	0.33***			NA	NA	NA	0.36***		
dh_m2y_n	0.30***			NA	NA	NA	0.58**	0.61**	

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<b>Germany</b>	1992:11 – 2003:6			1992:11 – 1998:12			1999:1 – 2003:6		
dh_on	NA	NA	NA	NA	NA	NA	0.22***		
<b>Corporate deposits</b>									
<b>CEE-5</b>									
<b>Czech Republic</b>	1995:12 – 2005:12			1995:12 – 2000:12			2001:1 – 2005:12		
df_on_s	NA	NA	NA	NA	NA	NA	0.15**		
df_lt_s	NA	NA	NA	NA	NA	NA	0.61***		
<b>Hungary</b>	1995:1 – 2005:12			1995:1 – 2000:12			2001:1 / 2001:5 – 2005:12		
df_l1y_n	0.81**	0.80**		0.89**	0.87**		0.95***		
df_m1y_n	0.91**	0.90**	A	0.95**	0.92**		0.81**	0.81**	C
df_lt_n	NA	NA	NA	NA	NA	NA	0.95***		
<b>Poland</b>	1996:12 / 1998:7 – 2005:12			1996:12 – 2000:12			2001:1 – 2005:12		
df_on_s	0.22***			0.17***			0.33***		
df_1y_s	0.71***			0.72***			0.69***		
df_m1y_s	0.89**	0.90**		0.62***			0.61***		
df_lt_s	0.87**	0.87**	A	0.69***			0.88**	0.79**	
<b>Euro area</b>									
<b>Austria</b>	1996:6 – 2005:11						1999:1 / 1999:6 – 2005:11		
df_on_s	0.15***			NA	NA	NA	0.25**	0.22**	
df_l1y_n	0.23***			NA	NA	NA	0.24***		
df_m2y_n	0.42**	0.43**		NA	NA	NA	0.39**	0.39**	

Source: Authors.

Note: See Table 2a.

to the behavior of deposit rates observed in Germany. Finally, no clear-cut statement can be made about the temporal evolution of the pass-through for corporate rates. For instance, the pass-through increased in the second sub-period for long-term lending rates in Spain, while it diminished for the very same rates in Hungary. At the same time, the coefficient for short-term lending rates rose in both countries. In Slovakia and Slovenia, the pass-through for long-term rates became significant in the second subperiod. By contrast, the pass-through coefficients of corporate lending rates (all maturities) in Poland and Germany were lower in the second period compared with the first and/or the whole period.

The estimations for the IFS dataset yield lower pass-through coefficients for the lending and deposit rates in most countries. This may be attributable to the fact that the data series are aggregated by sectors and maturity, which may have dampened the effect of monetary policy changes on the retail rates.<sup>25</sup>

<sup>25</sup> The results are not reported here, but are available from the authors upon request.

Table 2c

Interest Rate Pass-Through – Lending Rates											
			Whole period			1 <sup>st</sup> subperiod			2 <sup>nd</sup> subperiod		
			DOLS/1 <sup>st</sup> d	ARDL	AS	DOLS/1 <sup>st</sup> d	ARDL	AS	DOLS/1 <sup>st</sup> d	ARDL	AS
<b>Overall lending rates</b>											
<b>Czech Republic</b>			1995:12 – 2005:12			1995:12 – 2000:12			2001:1 – 2005:12		
	l <sub>1</sub> y <sub>s</sub>		-0.07**			-0.07			0.66***		
	l <sub>1</sub> y5y <sub>s</sub>		NA	NA	NA	NA	NA	NA	0.25		
<b>Lending rates for households CEE-5</b>											
<b>Czech Republic</b>											
	lh <sub>1</sub> y <sub>s</sub>		NA	NA	NA	NA	NA	NA	0.75		
	lh <sub>1</sub> y5y <sub>s</sub>		NA	NA	NA	NA	NA	NA	0.7		
	lh <sub>m</sub> 5y <sub>s</sub>		NA	NA	NA	NA	NA	NA	0.8		
<b>Hungary</b>			1995:1 / 1997:1 – 2005:12			1995:1 / 1997:1 – 2000:12			2001:1 – 2005:12		
	lhc <sub>1</sub> l <sub>y_n</sub>		0.42**	0.42**	C	0.55**	0.55**		0.57**	0.66**	C
	lhc <sub>1</sub> l <sub>y_s</sub>		NA	NA	NA	NA	NA	NA	0.38***		
	lhc <sub>m</sub> 1y <sub>n</sub>		0.24			0.60**	0.57**		0.29		
	lhc <sub>m</sub> 1y <sub>s</sub>		NA	NA	NA	NA	NA	NA	0.24***		
	lhh <sub>n</sub>		0.07			1.00**	1.11**		0.16		
	lhh <sub>s</sub>		NA	NA	NA	NA	NA	NA	0.16**		
<b>Poland</b>			1996:12 / 1998:7 – 2005:12			1996:12 – 2000:12			2001:1 – 2005:12		
	lh <sub>n</sub>		0.63***			NA	NA	NA	0.43***		
<b>Slovakia</b>			1994:1 – 2002:12			1998:7 – 2004:12			2001:1 – 2004:12		
	lh <sub>s</sub>		NA	NA	NA	-0.06**	-0.06		-0.03		
	lh <sub>n</sub>		NA	NA	NA	-0.57**	-0.60**		-0.55**	-0.57**	
	lhc <sub>s</sub>		NA	NA	NA	-0.41			-0.53		
	lhc <sub>n</sub>		NA	NA	NA	-0.29**	-0.24		-0.25*	-0.26	
	lhc		NA	NA	NA	-0.53			-1.39**	-1.50**	
<b>Slovenia</b>			1994:1 – 2002:8			1998:7 – 2005:11			2001:1 – 2005:11		
	lhc		0.92*			0.13			0.76**	0.72**	
	lhh		0.86*			0.25			1.14**	1.12**	B
<b>Euro area</b>											
<b>Austria</b>			1996:6 – 2005:11						1999:1 / 1999:6 – 2005:11		
	lhc <sub>1</sub> l <sub>y_n</sub>		NA	NA	NA	NA	NA	NA	0.25***		
	lhc <sub>1</sub> y5y <sub>n</sub>		NA	NA	NA	NA	NA	NA	1.02**	1.04**	
	lhh <sub>1</sub> l <sub>y_n</sub>		0.20***			NA	NA	NA	0.19***		
	lhh <sub>5</sub> y <sub>n</sub>		0.20***			NA	NA	NA	0.20***		
<b>Germany</b>			1992:11 – 2003:6			1992:11 – 1998:12			1999:1 – 2003:6		
	lh <sub>st</sub>		NA	NA	NA	NA	NA	NA	0.18***		
	lh <sub>lt</sub>		0.19***			0.19***			0.14***		
	lhc		0.19***			0.19***			0.14***		
	lhh		0.18**			0.22			0.14		
	lhh <sub>5</sub> y		0.18**			0.22			0.14		
	lhh <sub>10</sub> y		0.07			0.02			0.06		
<b>Spain</b>			1992:11 – 2003:6			1992:11 – 1998:6			1999:1 – 2003:6		
	lh		1.24**	1.19**		1.29**	1.26**		0.60**	0.60**	
	lhh		1.19**	0.95**		1.24**	1.41**		0.65**	0.68**	C
<b>Lending rates for the nonfinancial corporate sector</b>											
<b>Czech Republic</b>			1995:12 – 2005:12			1995:12 – 2000:12			2001:1 – 2005:12		
	lf <sub>1</sub> l <sub>y_s</sub>		NA	NA	NA	NA	NA	NA	0.87**	0.86**	
	lf <sub>1</sub> y5y <sub>s</sub>		NA	NA	NA	NA	NA	NA	0.98**	1.02**	
	lf <sub>m</sub> 5y <sub>s</sub>		NA	NA	NA	NA	NA	NA	0.25		
<b>Hungary</b>			1995:1 – 2005:12			1995:1 – 2000:12			2001:1 – 2005:12		
	lf <sub>1</sub> l <sub>y_n</sub>		1.01**	1.00**	C	0.35***			0.96**	0.96**	C
	lf <sub>m</sub> 1y <sub>n</sub>		1.01**	0.97**		1.09**	1.07**	A	0.72**	0.72**	

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Poland		1996:12 / 1998:7 – 2005:12			1996:12 – 2000:12			2001:1 – 2005:12		
	lf_1y_n	0.83***			NA	NA	NA	0.50***		
	lf_m1y_n	0.78***			NA	NA	NA	0.45***		
	lf_3y_s	0.74***			0.87***			0.47***		
lf_n	0.79***			NA	NA	NA	0.54***			
Slovakia		1994:1 – 2002:12			1998:7 – 2004:12			2001:1 – 2004:12		
	lf_1y	0.28			1.04**	0.93**		0.73**	0.82**	
	lf_m1y	0.49			0.9			0.99**	1.03**	B
	lf_s	NA	NA	NA	0.72**	0.89**		0.15		
lf_n	NA	NA	NA	0.56			1.01**	1.03**		
Slovenia		1994:1 – 2002:8			1998:7 – 2005:11			2001:1 – 2005:11		
	lf_1y	0.91*			0.13			0.15		
lf_m1y	0.96*			0.25			1.27**	1.28**		
Austria		1996:6 – 2005:11						1999:1 / 1999:6 – 2005:11		
	lf_1y_n	NA	NA	NA	NA	NA	NA	0.42***		
	lf_1y5y_n	NA	NA	NA	NA	NA	NA	0.27**		
lf_1y1M_n	NA	NA	NA	NA	NA	NA	0.55***			
Germany		1992:11 – 2003:6			1992:11 – 1998:12			1999:1 – 2003:6		
	lf_la	NA	NA	NA	NA	NA	NA	0.14		
	lf_ha	NA	NA	NA	NA	NA	NA	0.13		
	lf_st_1	NA	NA	NA	NA	NA	NA	0.19***		
	lf_st_5	0.28***			0.27***			0.24***		
	lf_st_25	0.28***			0.33***			0.20***		
	lf_1y	0.28***			0.33***			0.20***		
	lf_2y	0.30***			0.39***			0.22**		
lf_m1y	NA	NA	NA	NA	NA	NA	0.13			
Spain		1992:11 – 2003:6			1992:11 – 1998:6			1999:1 – 2003:6		
	lf_1y	0.68***			0.70***			0.88**	0.76**	C
lf_m1y	0.37***			0.36***			0.73**	0.70**	C	

Source: Authors.

Note: See Table 2a.

### 5.3 The Pass-Through to Retail Rates via Market Rates

For the multivariate VAR approach, we select countries in accordance with a twofold criterion. First, at least 12-month MMR/T-bill rates and retail rates should be connected to the policy rate through a cointegrating vector obtained from the single-equation analysis. Second, both deposit and lending rates of comparable maturity should pass the cointegration criterion with positive and statistically significant coefficient estimates. The two countries which qualify in terms of these two criteria are the Czech Republic and Hungary.

For the Czech Republic, only the second subperiod is analyzed, given that cointegration for lending rates is found only in the period 2001–2005. The selected retail rates are lending rates for the nonfinancial corporate sector with a maturity of less than 1 year and 1–5 years and an aggregate deposit rate with a maturity of less than 1 year and household deposit rates for maturities longer than overnight. This leads us to build a system for short-term deposit and lending rates ( $mp \rightarrow 1mMMR \rightarrow 12mMMR \rightarrow dep(d_{1y\_s}) \rightarrow len(lf_{1y})$ ) and for long-term deposit and lending rates ( $mp \rightarrow 1mMMR \rightarrow 12mMMR \rightarrow gbond \rightarrow dep(dh_{lt\_s}) \rightarrow len(lf_{1y5y})$ ).

For the short-term system,<sup>26</sup> the trace statistics identify four cointegration vectors. This indicates a full-fledged pass-through from the monetary policy rate to deposit and lending rates. The long-term coefficient, shown in table 3, is close to unity for market rates (1.01 and 1.05). It is 0.73 for the relation 12-month MMR – deposit rate, which is in line with the findings of the single-equation approach if accounting for the previous chains (0.75 versus  $1.01 \cdot 1.05 \cdot 0.73 = 0.77$ ). The long-run coefficient between deposit and lending rates is as high as 1.16. Therefore, we think that this coefficient does not capture the relationship between deposit and lending rates, but rather reflects the relative size of the pass-through from 12-month MMR rates to those rates. Indeed, if we specify the fourth cointegration vector as linking 12-month MMR rates to the lending rates, the estimated coefficient will be 0.85, which is higher than the coefficient for the relation 12-month MMR – deposit rate, thus confirming our earlier results from the direct monetary policy approach (0.86–0.87 versus  $1.01 \cdot 1.05 \cdot 0.85 = 0.90$ ).

Table 3

Multivariate Analysis – Results							
	COINT	MP →1mMMR	1mMMR →12mMMR	12mMMR →GBOND	12mMMR →DEP	DEP →LEN	12mMMR →LEN
<b>Czech Republic</b>							
MP→1m MMR→12m MMR→DEP (D_L1Y_S)→LEN (LF_L1Y)							
2001:1 – 2005:12	4**	1.01**	1.05**		0.73**	1.16**	
K=1	4**	1.01**	1.05**		0.73**		0.85**
MP→1m MMR→12m MMR→GBOND→DEP (DH_LT_S)→LEN (LF_1Y5Y)							
2001:1 – 2005:12	4**	1.01**	0.92**	..	0.56**	1.84**	
K=1	4**	1.01**	0.92**	..	0.56**		1.03**
<b>Hungary</b>							
MP→1m MMR→12m TBILL→DEP (DF_M1Y_N)→LEN (LHC_L1Y_N)							
1997:3 – 2005:12	4**	1.02**	0.98**		0.93**	0.42**	
K=1	4**	1.01**	0.98**		0.93**		0.39**
2001:1 – 2005:12	4**	1.02**	0.85**		0.99**	0.72**	
K=1	4**	1.02**	0.85**		0.99**		0.72**
MP→1m MMR→12m TBILL→DEP (DF_M1Y_N)→LEN (LF_M1Y_N)							
1997:3 – 2005:12	4**	1.01**	0.98**		0.93**	1.06**	
K=2	4**	1.02**	0.98**		0.94**		0.99*
2001:1 – 2005:12	4**	1.02**	0.85**		0.99**	0.84**	
K=2	4**	1.02**	0.85**		0.99**		0.83**

Source: Authors.

Note:  $k=1$  or  $k=2$  indicates the lag length chosen by the Schwarz information criterion. COINT shows the number of cointegrating vectors detected by the trace statistic. \* and \*\* indicate statistical significance at the 10% and 5% levels, respectively.

In the system of long-term rates with six variables, we detected four cointegration relationships. Given that one more variable is included (government bond rates), one chain link is not functional. Our earlier results from the single-equation approach implicitly indicate the absence of cointegration for

<sup>26</sup> The lag length in the VAR is selected using the Schwarz information criterion by setting the maximum number of lags to six as in the single-equation approach.

the link 12-month MMR – government bond yield.<sup>27</sup> The long-run coefficients of this system reported in table 3 confirm an almost one-to-one reaction of the lending rates to 12-month MMR.

For Hungary, only a five-variable system excluding government bond rates is estimated, since we did not find cointegration between the policy rate and government bond yields. The two systems estimated for consumer loan rates and corporate lending rates provide evidence of a full-fledged transmission from the policy rate through 1-month MMR and 12-month T-bill rates to deposit rates (new long-term corporate deposit rates) and lending rates (new short-term consumer lending rates and new long-term corporate lending rates). The results furthermore confirm the findings of the single-equation estimations which show a very strong pass-through to long-term deposit rates and indicate that the pass-through is higher for (long-term) corporate loan rates than for (short-term) consumer loan rates, even though the former becomes weaker, while the latter rises slightly over time.

#### 5.4 Comparison with the Literature

Whenever a researcher carries out an empirical analysis, the question arises how the new results compare with those provided in the already existing literature. Table 4 provides an answer to this question by summarizing the findings reported in other studies regarding the size of the long-run pass-through to different retail rates for the Czech Republic, Hungary, Poland and Slovakia. Despite some similarities, we discovered several prominent differences between our results and the existing estimates: (1) Our estimates indicate a lower pass-through for overnight and long-term household deposit rates in Hungary and a moderately lower pass-through for all kinds of deposit rates in Poland. (2) Our results show a moderately lower pass-through for long-term corporate loan rates in Hungary and for short- and long-term corporate loan rates in Poland. (3) Our estimations fail to establish any significant relationship between monetary policy rates on the one hand, and deposit rates in Slovakia, as well as aggregate household loan rates (and consumer loan rates) in the Czech Republic and Slovakia, on the other hand.

One key reason for the differences between our results and those obtained by other researchers is that most of them estimate error correction models without having checked the existence of a valid cointegration relationship. However, a number of series are not cointegrated with policy rates. The estimated coefficients we derived by using regressions applied to first differenced series tend to be lower than those resulting from the cointegration analysis (which was inappropriate in the given context). Another possible explanation for our lower estimates is a possible decrease in the pass-through over time, given that our data sample covers more recent periods.

<sup>27</sup> The pass-through from the policy rate to the 12-month MMR is almost complete, while no cointegration could be detected between the monetary policy rate and government bond yields for the second subperiod. This implies a lack of cointegration between the 12-month MMR and government bond yields.

Table 4

**Overview of the Literature**

		Author	Time	LR PT
<b>Rates on short-term deposits</b>				
CZ	ALL	T (2004)	1995:1 – 2004:2	0.79
CZ	ALL, 1M-12M	CER (2004)	1997:2 – 2002:12	0.84
CZ	HH	SK (2004)	1993:1 – 2003:12	0.07
HU	ALL	T (2004)	1995:1 – 2004:2	0.82
HU	HH, O/N	CER (2004)	1994 / 1997 – 2002:12	0.49
HU	HH, 1Y	CER (2004)	1994 / 1997 – 2002:12	0.92
HU	HH, 1Y	SK (2004)	1995:1 – 2003:12	0.36 – 0.82
PL	ALL	T (2004)	1995:1 – 2004:2	0.98
PL	HH, O/N	CER (2004)	1994:1 – 2002:12	0.77 c
PL	HH, 1M	WP (2002)	1995 – 2002	0.80
PL	HH, 3M,6M,12M	WP (2002)	1995 – 2002	0.91 c
PL	HH, 1M-12M	SK (2004)	1996:12 – 2003:12	0.82 – 0.91
PL	HH, 1Y	CER (2004)	1994:1 – 2002:12	0.98 c
PL	COR, 1M-12M	SK (2004)	1996:12 – 2003:12	0.82-0.93
SK	ALL	T (2004)	1995:1 – 2004:2	1.26
SK	ALL, 1M-12M	SK (2004)	1995:1 – 2003:12	0.28 – 0.71
<b>Rates on long-term deposits</b>				
CZ	ALL	T (2004)	1995:1 – 2004:2	0.49
CZ	ALL, 1Y-4Y	CER (2004)	1997:2 – 2002:12	0.85
CZ	HH	SK (2004)	1993:1 – 2003:12	0.28-0.62
HU	ALL	T (2004)	1995:1 – 2004:2	0.90
HU	HH	HKN (2004)	2001:1 – 2004:1	0.86
HU	HH, >1Y	CER (2004)	1994 / 1997 – 2002:12	0.91
HU	HH, >1Y	SK (2004)	1995:1 – 2003:12	0.90
HU	COR	HKN (2004)	2001:1 – 2004:1	0.87
HU	COR, panel	HKN (2004)	2001:1 – 2004:1	0.87
PL	ALL	T (2004)	1995:1 – 2004:2	0.91
PL	HH, >1Y	CER (2004)	1994:1 – 2002:12	0.96 c
PL	HH, 2Y	SK (2004)	1996:12 – 2003:12	0.91
PL	COR, 2Y	SK (2004)	1996:12 – 2003:12	0.88
PL	COR, 3Y	SK (2004)	1996:12 – 2003:12	0.83
SK	ALL	T (2004)	1995:1 – 2004:2	1.01
SK	ALL, 2Y	SK (2004)	1995:1 – 2003:12	0.24
SK	ALL, 5Y	SK (2004)	1995:1 – 2003:12	0.20
SK	ALL, >5Y	SK (2004)	1995:1 – 2003:12	0.06
<b>Short-term loans</b>				
CZ	ALL	T (2004)	1995:1 – 2004:2	0.76
CZ	ALL, NEW	T (2004)	1995:1 – 2004:2	1.04
CZ	ALL, <1Y	CER (2004)	1997:2 – 2002:12	0.76
CZ	COR	SK (2004)	2001:1 – 2003:12	0.95
HU	ALL	T (2004)	1995:1 – 2004:2	1.09
HU	COR	SK (2004)	1995:1 – 2003:12	1.01
HU	COR, <1Y	CER (2004)	1994 / 1997 – 2002:12	1.01 c
PL	COR, 1Y	CER (2004)	1994:1 – 2002:12	1.02 c
PL	COR, 1Y	WP (2002)	1995 – 2002	1.03 c
SK	ALL	T (2004)	1995:1 – 2004:2	1.62
SK	ALL, NEW	T (2004)	1995:1 – 2004:2	1.21
SK	COR	SK (2004)	1995:1 – 2003:12	0.65
<b>Long-term loans</b>				
CZ	ALL	T (2004)	1995:1 – 2004:2	0.65
CZ	ALL, NEW	T (2004)	1995:1 – 2004:2	0.83
CZ	ALL, 1Y-4Y	CER (2004)	1997:2 – 2002:12	0.64
HU	ALL	T (2004)	1995:1 – 2004:2	0.67
HU	COR	SK (2004)	1995:1 – 2003:12	1.11
HU	COR	HKN (2004)	2001:1 – 2004:1	0.98 c
HU	COR, panel	HKN (2004)	2001:1 – 2004:1	0.95
HU	COR, >1Y	CER (2004)	1994 / 1997 – 2002:12	1.02 c

PL	ALL	T (2004)	1995:1 – 2004:2	0.85
PL	COR	SK (2004)	1996:12 – 2003:12	0.99
PL	COR, 3Y	CER (2004)	1994:1 – 2002:12	0.98 c
SK	ALL	T (2004)	1995:1 – 2004:2	0.79
SK	ALL, NEW	T (2004)	1995:1 – 2004:2	0.93

**Consumer loans**

CZ		Kot (2004)	1996:1 – 2004:1	0.42
CZ		SK (2004)	1993:1 – 2003:12	0.26
HU		Kot (2004)	1998:1 – 2004:4	0.36
HU		SK (2004)	1995:1 – 2003:12	0.51
HU		HKN. (2004)	2001:1 – 2004:1	0.81
PL		Kot (2004)	1997:1 – 2004:4	0.59
PL		WP (2002)	1997 – 2002	0.85
PL		SK (2004)	1996:12 – 2003:12	0.60
SK		SK (2004)	1995:1 – 2003:12	0.02

Source: Authors.

Note: CZ, HU, PL and SK refer to the Czech Republic, Hungary, Poland and Slovakia. HH and COR stand for data series for households and for the corporate sector, while ALL is the aggregated series. NEW indicates interest rate series for new loans/deposits, and the figures after ALL, HH and COR indicate the precise maturity. CER(2004), HKN (2004), N(2005), SK(2004), T(2004) and WP(2002) are Crespo-Cuaresma et al. (2004), Horváth et al. (2004), Sander and Kleimeier (2004b), Tieman (2004) and Wróbel and Pawłowska (2002), respectively. (c) indicates that complete pass-through cannot be rejected.

## 6 Concluding Remarks

In this study, we analyzed the size of the interest rate pass-through for five CEE countries and three euro area benchmark countries. Our results confirm earlier findings in the literature that the pass-through is generally very low for overnight deposit rates, but becomes substantially higher for short- to long-term deposit rates. At the same time, corporate lending rates are much more responsive to changes in the policy rate than deposit or household loan rates. Remarkably, the pass-through is almost complete for corporate lending rates in the Czech Republic, Hungary, Slovakia, Slovenia and, to a slightly lesser extent, in Spain.

However, given the broad range of results with regard to country-specific pass-through estimates, these findings should be generalized only with appropriate caution. Not only corporate loan rates, but also housing loan rates in Slovenia and in Spain and corporate deposit rates in Hungary exhibit (almost) complete pass-through. In Poland and Germany, the pass-through to deposit rates is stronger than that to lending rates. Just to mention a few findings at the other extreme, no significant pass-through could be established for long-term corporate lending rates in Slovakia, for some corporate lending rates in Germany and for new housing loan rates in Hungary. The pass-through to household (and consumer) lending rates in the Czech Republic and Slovakia and to deposit rates in Slovenia appears to be nonexistent.

We found little empirical support for a functioning pass-through to long-term market rates, presumably owing to the instability of the yield curve at the longer end of the curve. Instead, we found evidence that the effect of changes in the key policy rate even transits through money market and T-bill rates to long-term deposit and lending rates. In most cases, it is not possible to use a cointegrated VAR framework to track down the whole mechanism of pass-through because it is difficult to detect solid cointegration relationships. Indeed, this framework is capable of describing the interrelated chains of the whole mechanism only for the Czech Republic and Hungary.

While other papers identify no major asymmetries for the CEE-5, our results indicate that the reaction of retail and market rates becomes increasingly asymmetric depending on the direction of changes in the policy rate. However, it was not possible to make out a general pattern for this asymmetric behavior for specific interest rates (except, perhaps, for short-term money market rates).

More importantly, our pass-through estimates for the CEE-5 tend to be lower for a number of retail rates than those of previous estimates, and we failed to detect significant pass-through effects in a number of cases both for the CEE-5 and the euro area countries. This is, among others, attributable to the fact that previous studies have chiefly relied on error correction models without explicitly checking the presence of cointegrating relationships between the policy and retail rates. We show that cointegration can be established only for a fraction of the bivariate relationships and that pass-through estimates obtained for first differenced stationary series are lower and sometimes insignificant. Furthermore, our lower pass-through estimates could also indicate that pass-through is declining over time, as our data is from a more recent period. This hypothesis is backed by direct evidence.

While the interest rate pass-through is on average higher in the CEE-5 than in Austria and Germany, it tends to decline in the CEE-5, in particular in Hungary and (with respect to lending rates) in Poland. In some cases, however, the evolution of the pass-through over time is not homogeneous even in one country. The substantial slowdown in inflation rates (and in real GDP growth for a few years in some countries) could be elements of an explanation for the weakening of the pass-through on the macro side. Moreover, our finding of a declining pass-through calls into question the general belief that competition among banks has increased in recent years.

At the same time, the interest rate pass-through in the CEE-5 is more comparable with that in Spain than with that in the other euro area countries. This implies that the euro area will probably not become more heterogeneous with respect to the interest rate pass-through in the event that the CEE-5 adopt the euro. In addition, the interest rate pass-through improved slightly in Spain and in Austria, while remaining stable and weak in Germany after the introduction of the euro. This observation casts doubt on the universality of the much-advocated pass-through-improving effect of the euro owing to an increased integration of, and a higher level of competition on, the euro area financial markets.

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## Data Appendix

**Czech Republic:** Data series are obtained from Česká národní banka if not indicated otherwise (in parentheses).

1995:12 – 2005:12 mp (2-week repo rate), mmr (Datastream 1995:12-96:12, Bloomberg thereafter), mmr12 (Datastream, PRIBK1Y), d\_on\_s, d\_lt\_s, d\_l1y\_s, l\_l1y\_s

1997:2 – 2005:12 gbond (Bloomberg)

2001:1 – 2005:12 dh\_on\_s, dh\_lt\_s, df\_on\_s, df\_lt\_s, l\_1y5y\_s, lh\_l1y\_s, lh\_1y5y\_s, lh\_m5y\_s, lf\_l1y\_s, lf\_1y5y\_s, lf\_m5y\_s.

**Hungary:** Data series are obtained from Magyar Nemzeti Bank if not indicated otherwise (in parentheses).

1995:1 – 2005:12 mp (active overnight repo rate until 1995:12, passive 1-month repo rate from 1996:12 to 1999:2, 2-week deposit rate thereafter), dh\_on\_n, dh\_on\_s, dh\_lt\_n, dh\_lt\_s, dh\_l1y\_n, dh\_m1y\_n, df\_l1y\_n, df\_m1y\_n, lhh\_n, lf\_l1y\_n, lf\_m1y\_n

1995:9 – 2005:12 mmr (Datastream 1995:9–1996:7, Bloomberg thereafter)

1997:1 – 2005:12 lhc\_l1y\_n, lhc\_m1y\_n

1997:3 – 2005:12 tbill, gbond

2000:1 – 2005:12 df\_lt\_n, lhc\_l1y\_s, lhc\_m1y\_s, lhh\_s

2001:5 – 2005:12 dh\_l1y\_s, dh\_m2y\_n, dh\_m2y\_s

**Poland:** Data series are obtained from Narodowy Bank Polski if not indicated otherwise (in parentheses).

**1994:2 – 2005:11** mp (1994:2–1994:3 rediscount rate; thereafter short-term NBP bills: “intervention rate”), mmr (Datastream 1994:2–1996:8, Bloomberg thereafter), tbill (Ministry of Finance), gbond (Ministry of Finance, Bloomberg thereafter)

**1996:12 – 2005:11** dh\_on\_s, dh\_lt\_s, dh\_1y\_s, dh\_m1y\_s, df\_on\_s, df\_lt\_s, df\_1y\_s, df\_m1y\_s, lf\_3y\_s

Data series are obtained from NewCronos/Eurostat:

**1998:07 – 2005:11** lh\_n, lf\_l1y\_n, lf\_m1y\_n, lf\_n, d\_on\_n

**Slovakia:** The data series are obtained from NewCronos/Eurostat if not indicated otherwise (in parentheses).

**1994:1 – 2005:12** mp (NewCronos: other official rates until 2000:1; official refinancing operation rate thereafter; cross-checked with Národná banka Slovenska data), mmr (Národná banka Slovenska via Datastream: SXIBK1M; cross-checked with NewCronos data)

**1994:9 – 2005:12** mmr12 (Národná banka Slovenska via Datastream: SXIBK1Y)

**1994:1 – 2002:12** d\_l1y, d\_m1y, lf\_l1y, lf\_m1y

**1998:7 – 2004:12** lf\_l1y\_s, lf\_l1y\_n, lf\_m1y\_s, lf\_s, lf\_n, lhc\_s, lhc\_n, lhc, lh\_s, lh\_n, d\_on\_s

**Slovenia:** The data series are obtained from NewCronos/Eurostat if not indicated otherwise (in parentheses).

**1994:1 – 2005:11** mp (NewCronos: official lending rate)

**1994:1 – 2002:08** lf\_l1y, lf\_m1y, lhc, lhh, d\_l1y,

**1998:7 – 2005:11** lf\_l1y\_n, lf\_m1y\_n, lhc\_n, lhh\_n, d\_on\_n, d\_m1y.

**Germany:** The data series are obtained from the Deutsche Bundesbank if not indicated otherwise (in parentheses).

**1992:11 – 2005:12** mp (NewCronos: official refinancing operation rates, Deutsche Bundesbank until 1998:12, European Central Bank after 1999:1), mmr, mmr12, gbond (4-5-year government bond)

**1991:1 – 2003:6** lh\_lt, lhh\_5y, lhh\_10y, lhh, lhc, lhh, lf\_st\_5, lf\_st\_25, lf\_2y, lf\_l1y, d\_1m\_la, \_1m\_ma, d\_1m\_ha, d\_4y, d\_l1y,

**1996:11 – 2003:6** lf\_st\_1, lh\_st, lf\_m1y, dh\_on, d\_3m, lf\_la, lf\_ha, lh\_st

**Spain:** The data series are obtained from NewCronos/Eurostat if not indicated otherwise (in parentheses).

**1992:11 – 2003:6** mp (NewCronos: official refinancing operation rates, Banco de España until 1998:12, European Central Bank after 1999:1), mmr (Datastream: ESMIB1M), mmr12 (Datastream: ESMIB1Y), gbond (5-year swap, Datastream: ICESP5Y), lf\_l1y, lf\_m1y, lh, lhh, d\_on, d\_l1y, d\_other,

**Austria:** The data series are obtained from the Oesterreichische Nationalbank if not indicated otherwise (in parentheses).

**1995:12 – 2005:11** mp (NewCronos: official refinancing operation rates, Oesterreichische Nationalbank until 1998:12, European Central Bank after 1999:1), mmr (Bloomberg), mmr12 (Bloomberg), gbond (Bloomberg), dh\_on\_s, dh\_l1y\_n, dh\_m2y\_n, df\_on\_s, df\_l1y\_n, df\_m2y\_n, lhh\_l1y\_n, lhh\_1y5y\_n

**1999:6 – 2005:11** lf\_l1y\_n, lf\_1y5y\_n, lf\_l1y1M\_n, lhc\_l1y\_n, lhc\_1y5y\_n

# Credit Growth in Central and Eastern Europe: New (Over)Shooting Stars?

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*This paper analyzes the equilibrium level of private credit to GDP in 11 Central and Eastern European countries on the basis of a number of dynamic panels containing quarterly data on Central and Eastern European economies, emerging markets and developed OECD countries. In doing so, we propose a unifying framework which includes factors driving both the demand for and the supply of private credit. We emphasize that relying on in-sample panel (i.e. including only transition countries) estimates for transition economies is problematic not only because of the upward bias of the estimated constant and slope coefficients due to the initial undershooting and the ensuing steady adjustment toward equilibrium, but also because of the instability of the equations estimated for transition economies. The use of out-of-sample (i.e. excluding transition economies) panels suggests that some of the transition economies might have already come close to equilibrium by 2004, whereas others have private credit-to-GDP ratios which are well below the level the fundamentals would justify.*

## 1 Introduction

The emerging literature on credit growth in transition economies has documented that lending to the private sector has recently grown dynamically in a number of transition economies.<sup>5</sup> Credit growth has been promoted by macroeconomic stabilization, by comprehensive reforms and privatization in the financial sector, by the introduction of market institutions and by legal reforms. Nevertheless, the recent boom in bank lending in Central and Eastern Europe (CEE) has prompted the question of whether the growth rates recorded in these countries can be viewed as sustainable in the medium to long run.

In this paper, we investigate the macro- and microeconomic determinants of domestic credit to the private sector as a percentage of GDP in 11 CEE countries as well as its equilibrium level.<sup>6</sup> The empirical model we have used for this purpose can be viewed as a unifying framework which includes both demand-side and supply-side variables. We have tested our empirical specifi-

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<sup>4</sup> The paper benefited from discussion at seminars held at the Oesterreichische Nationalbank, the Banco de España and at DG ECFIN (European Commission). We are especially indebted to Ronald Albers, Kalin Hristov, Dubravko Mihaljek, Max Watson, and two anonymous referees for stimulating and useful comments. We are also indebted to Caralee McLiesh for sharing with us the dataset used in the paper "Private credit in 129 countries" (NBER Working Paper 11078), to Ivanna Vladkova-Hollar for providing us with the financial liberalization indicator, to Gergő Kiss for sharing data on housing prices in Hungary, and to Rafal Kierzenkowski, Lubos Komárek, Mindaugas Leika and Peeter Luikmel for help in obtaining housing prices for France, the Czech Republic, Lithuania and Estonia, respectively. We also thank Steven Fries and Tatiana Lysenko for the EBRD transition indicators going back to the early 1990s and Rena Mühldorf for language advice. The opinions expressed in this paper do not necessarily represent the views of the European Central Bank, the Oesterreichische Nationalbank or the European System of Central Banks (ESCB).

<sup>5</sup> See e.g. Cottarelli, Dell'Ariccia and Vladkova-Hollar (2003), Backé and Zumer (2005) and Duenwald, Gueorguiev and Schaechter (2005).

<sup>6</sup> Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

cation for a variety of panels composed of (1) developed small and large OECD countries, (2) emerging market economies from Asia and the Americas, and (3) a number of in-sample panels<sup>7</sup> for transition economies.

The use of these panels provides some interesting perspectives. First of all, in-sample panels might give useful insights regarding the major determinants of credit-to-GDP levels in CEE. However, as financial depth in most transition economies remains comparatively low, it might well be that private credit to GDP has still remained below its equilibrium level for most of the last decade. If this were so, it would give rise to a bias in the econometric estimates, as credit-to-GDP ratios tend to converge toward their equilibrium levels.<sup>8</sup> The use of the OECD and emerging markets panels may help to tackle this problem. Results derived from the emerging markets panel may be a good benchmark for equilibrium levels at a medium-term horizon, while estimates based on the panel of small open OECD countries may show equilibrium levels at a longer horizon, at which the CEE countries will have caught up in terms of overall economic development.

The paper is structured as follows. Section 2 reviews some stylized facts regarding credit growth in the transition economies. Section 3 deals with initial under- and overshooting of the credit-to-GDP ratio and with its consequences for econometric testing. Section 4 presents the economic specification used for the estimations and describes the dataset and the estimation techniques. Section 5 then presents and discusses the estimation results. Finally, section 6 contains some concluding remarks.

## 2 Some Stylized Facts

To place credit developments in transition economies into context, it is useful to recall that financial systems in these countries are bank-based – about 85% of financial sector assets are bank assets – and that capital markets (in particular corporate bond and stock market segments) are generally not very developed. This implies that bank credit is the main source of external financing in these countries, although also foreign direct investment (FDI) has been important in some countries. Banking sectors in transition economies in CEE have undergone a comprehensive transformation in the past one-and-a-half decades, including a complete overhaul of the regulatory framework, bank consolidation schemes and – in almost all countries – sweeping privatization, mainly to foreign strategic owners (mostly financial institutions based in “old” EU Member States). Consequently, the governance of banks has greatly improved, and the performance and health of banking sectors have advanced substantially, as standard prudential indicators on capitalization, asset quality, profitability and liquidity show.<sup>9</sup>

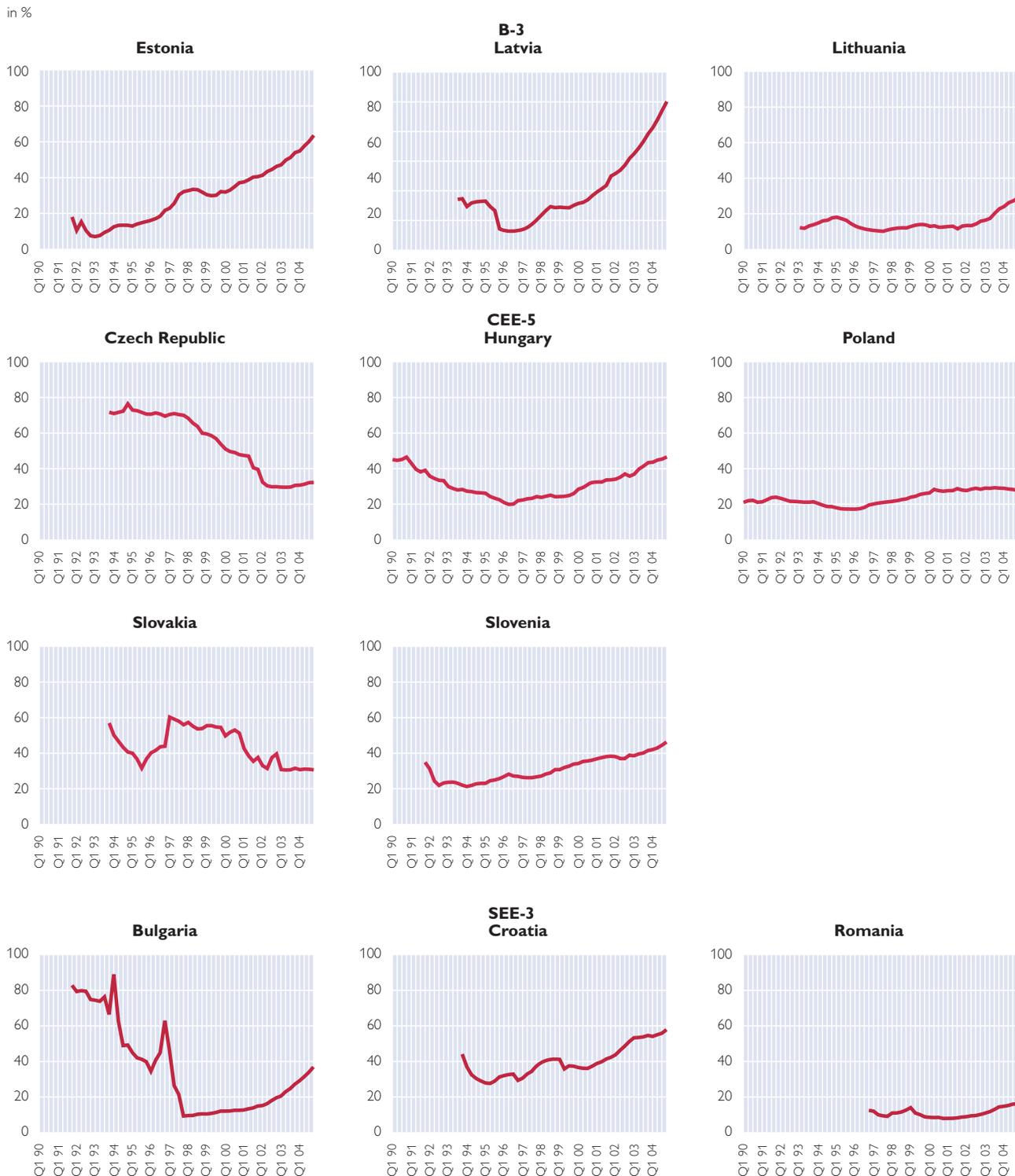
Chart 2 gives an overview of the development of credit to the private sector in percent of GDP from the early 1990s to 2004. Several observations can be made on the basis of chart 1. Some countries, namely Estonia, Latvia,

<sup>7</sup> We use the terms “in-sample” and “out-of-sample” to denote country coverage. In-sample panels include the countries to which the estimation results are applied while out-of-sample panels exclude them.

<sup>8</sup> An analogous line of reasoning is applied in the literature on equilibrium exchange rates of CEE countries (Maeso-Fernandez, Osbath and Schnatz, 2005).

<sup>9</sup> See e.g. Barisitz (2005), Cottarelli et al. (2003), ECB (2005), and EBRD (2005).

**Bank Credit to the Private Sector as a Percentage of GDP, 1990 to 2004**



Source: Authors' calculations based on data drawn from the IMF's International Financial Statistics. For exact data definitions, see section 4.2.

Note: B-3 covers Estonia, Latvia and Lithuania; CEE-5 covers the Czech Republic, Hungary, Poland, Slovakia and Slovenia; SEE-3 covers Bulgaria, Croatia and Romania.

Lithuania, Poland, Romania and Slovenia, started transition with low credit-to-GDP ratios of around 20%. Estonia and Latvia then recorded a marked increase in the ratio, and the credit-to-GDP ratio also rose steadily in Slovenia from the early 1990s to 2004, although the overall increase was less pronounced than in the two aforementioned Baltic countries. Credit growth has picked up only recently in Lithuania and Romania, and for Poland, only a moderate increase can be observed during the second half of the period studied.

By contrast, the second group of countries, notably Croatia and Hungary, started transition with higher credit-to-GDP ratios than the Baltic countries. After dropping considerably to close to 20%, the ratio started to increase, reaching pretransition levels in Hungary and growing to levels well exceeding 40% in Croatia by 2004.

The third group of countries, comprising Bulgaria, the Czech Republic and Slovakia, had the highest credit-to-GDP ratio at the beginning of the period (between 60% and 80%). For Bulgaria, this ratio came down to 10% in 1997, while expanding to close to 40% by 2004.<sup>10</sup> The Czech Republic and Slovakia also recorded a substantial contraction (to nearly 30% for both countries), while the ratios seem to have stabilized during the last couple of years.

The differences in initial credit-to-GDP levels can be traced largely to different approaches with respect to the financing of (credit to) enterprises under central planning across countries as well as strongly negative real interest rates right before or at the start of transition in some cases. In turn, major temporary contractions in credit-to-GDP ratios during the transition process have mainly been due to banking consolidation measures, by which nonperforming assets were removed from banks' balance sheets. In a few cases, high inflation episodes combined with strongly negative real interest rates also contributed to reducing financial depth temporarily during the transition process (e.g. in Bulgaria from 1996 to 1997).

### 3 Equilibrium Credit Growth

#### 3.1 Initial Under- and Overshooting...

The question of whether or not credit growth in transition economies is excessive is closely related to the issue of what the equilibrium level of the stock of bank credit to the private sector as a share of GDP in those countries is. It is a widely observed fact that economic development goes hand in hand with an increase in the credit-to-GDP ratio. This is demonstrated in chart 2 when moving from point A through B to C. The depicted trajectory of the increase in the credit-to-GDP ratio (credit growth) can be thought of as an equilibrium phenomenon insofar as it is in line with economic fundamentals, in particular with GDP per capita figures.<sup>11</sup>

<sup>10</sup> Note that the peculiar and rather fuzzy pattern of the credit-to-GDP ratio in Bulgaria shown in chart 1 is not due to data problems but, to a considerable extent, is driven by exchange rate movements. The ratio rose sharply in 1994, 1996 and 1997 because of the depreciation of the domestic currency vis-à-vis the U.S. dollar, considering that a significant share of credit was denominated in foreign currency (mainly U.S. dollars). Correction of the credit ratio occurred in the post-crisis period because of the appreciation of the domestic currency and because of the write-off of nonperforming loans.

<sup>11</sup> In other words, this approach corresponds to the absolute convergence hypothesis one can find in the growth literature.

Nevertheless, we may also think of a situation when the observed credit-to-GDP ratio is out of tune with economic fundamentals. Point A' depicts the situation when the initial credit-to-GDP ratio is higher than justified by the level of economic development (initial overshooting). By contrast, point A'' shows a credit-to-GDP ratio which is lower than predicted by the level of economic development of the given country (initial undershooting). In those cases, credit growth should differ from the equilibrium rate of growth, and this would secure the return to the equilibrium level of the credit-to-GDP ratio.<sup>12</sup>

Initial undershooting may be important for transition economies, most of which started economic transformation with lower levels of credit to GDP than other countries at the same level of development would have in other parts of the world. This is a heritage of central planning because of the underdevelopment of the financial sector under the communist regime. Hence, once economic transformation from central planning to market is completed, higher credit growth in the transition economies may partly reflect the correction from this initial undershooting to the equilibrium level of the credit-to-GDP ratio. This is shown in chart 2, where the move from A'' to B can be decomposed into (1) equilibrium credit growth, given by A'' to B'', and 2) the adjustment from initial undershooting to equilibrium (from B'' to B).

However, the issue is whether the observed change in the credit-to-GDP ratio corresponds to the move from A'' to B. In cases of high credit growth rates, one might suspect that the increase in credit to GDP may be even higher than justified by the equilibrium change and the correction from initial undershooting. The move from A'' to B' on chart 2 indicates such an overshooting where the excessive increase in credit to GDP is given by the distance between B and B'.

### 3.2 ... and the Consequences

If there is initial under- or overshooting at the beginning of the transition process and if the adjustment toward equilibrium occurs gradually, implying persistent initial under- or overshooting, the use of panels including only transition economies may lead to severely biased constant terms and coefficient estimates, as put forward in the context of equilibrium exchange rates by Maeso-Fernandez, Osbath and Schnatz (2005). When regressing the observed credit-to-GDP ratio moving from A'' to B (instead of the equilibrium change from A to B) on a set of fundamentals, the slope coefficient would suffer from an obvious upward bias. By the same token, the constant term will be lower than it would be in the absence of an initial undershooting.

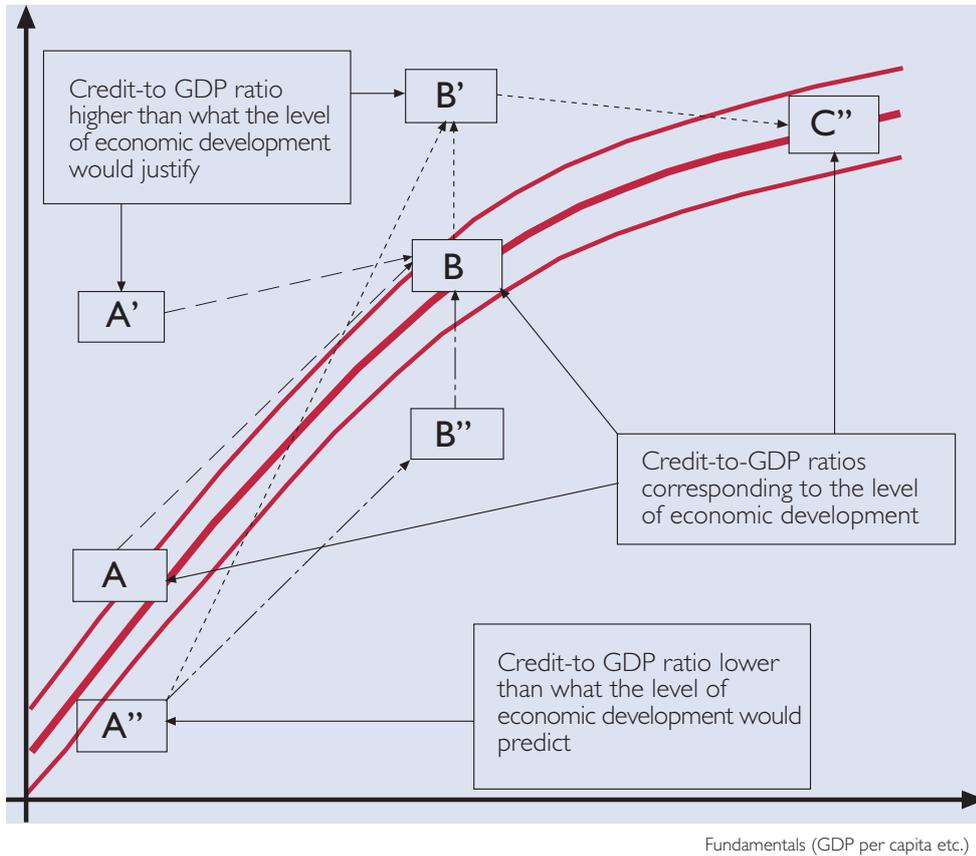
This is the reason why one would be well advised to use panels including countries which do not exhibit an initial under- or overshooting in the credit-to-GDP ratio or to use out-of-sample panels for the analysis of the equilibrium level of the credit-to-GDP ratio of transition economies.

<sup>12</sup> In both cases, credit growth is expressed in terms of GDP. For example, credit growth  $([C(t)-C(t-1)]/C(t-1))$  is higher for countries with lower credit-to-GDP levels than for countries with higher credit-to-GDP levels if both countries have similar credit-to-GDP flows. Hence, it is more appropriate to relate changes in credit to the GDP to avoid this distortion (Arpa, Reiningger and Walko, 2005), like we do in this study.

Chart 2

**The Evolution of the Credit-to-GDP Ratio**

Bank credit to the private sector (% of GDP)



Source: Authors.

**4 Economic and Econometric Specifications**

**4.1 The Empirical Model**

Most studies investigating credit growth employ a simple set of explanatory variables (see table 1), which usually includes GDP per capita or real GDP, some kind of (real or nominal) interest rate and the inflation rate (Calza et al., 2001, 2003; Brzoza-Brzezina, 2005). Hofmann (2001) extends this list by housing prices, a very important variable, because a rise in housing prices is usually accompanied by an increase in credit to the private sector.

Cottarelli et al. (2005) use indicators capturing factors which drive the demand for credit, but they also consider a number of variables which characterize the supply of credit. These variables describe the degree of financial liberalization, the quality and implementation of accounting standards, entry restrictions to the banking sector and the origin of the legal system. Finally, they use a measure of public debt aimed at analyzing possible crowding-out (or crowding-in) effects.

Table 1

Overview of Papers Analyzing the Determinants of Credit Growth		
Paper	Dependent variable	Explanatory variables
Calza et al. (2001)	Real loans	GDP per capita in PPS, short- and long-term real interest rates
Calza et al. (2003)	Real loans	Real GDP growth, nominal lending rate, inflation rate
Brzoza-Brzezina (2005)	Real loans	Real GDP growth, real interest rate
Hofmann (2001)	Real loans	Real GDP, real interest rate, housing prices
Cottarelli et al. (2005)	Credit to the private sector (% GDP)	GDP per capita in PPS, inflation rate, financial liberalization index, accounting standards, entry restrictions to the banking sector, German origin of the legal system, public debt

Source: Authors' calculations.

The economic specification which we estimate for the private credit-to-GDP ratio not only provides a unifying framework for the variables used in previous studies but also extends on them. We consider the following variables capturing both the demand for and the supply of credit from and to the private sector:

- GDP per capita in terms of purchasing power standards (PPS) (*CAPITA*). An increase in per capita GDP is expected to result in an increase in credit to the private sector. Alternatively, we also use real GDP (*gdpr*) and industrial production (*ip*) to check for the robustness of the GDP-per-capita variable and to see to what extent these variables, which are used interchangeably in the literature, are substitutes.
- Bank credit to the government sector in percent of GDP ( $C^G$ ). As this variable captures possible crowding-out effects, any increase (decrease) in bank credit to the government sector is thought to give rise to a decrease (increase) in bank credit to the private sector. It should be noted that bank credit to the government measures crowding out better than public debt as employed in Cottarelli et al. (2005) because public debt also includes loans taken out abroad and because public entities may well finance themselves on security markets. Moreover, public debt is subject to valuation and stock-flow adjustments.
- Short- and long-term nominal lending interest rates (*i*). Lower interest rates should promote credit to the private sector, implying a negative sign for this variable. Calza et al. (2001) use both short-term and long-term interest rates, arguing that whether short-term or long-term interest rates play a more important role depends on the respective share of loans with fixed interest rates and variable interest rates. Because the nominal lending interest rates used in the paper show a high correlation with short-term interest rates (three-month treasury bills and money market rates), short-term interest rates are used as a robustness check rather than as an additional variable.
- Inflation (*p*). High inflation is thought to be associated with a drop in bank credit to the private sector. Inflation is measured both in terms of the producer price index (PPI) and the consumer price index (CPI).
- Housing prices ( $p^{housing}$ ). Increases in housing prices result in a rise in the total amount which has to be spent to purchase a given residential or commercial property. This is subsequently reflected in an increase in demand for credit through which the higher purchasing price can be fully or partly

financed. This means that an increase in housing prices may generate more credit to the private sector. However, a fundamental problem arising here is whether price increases in the real estate market are driven by fundamental factors or whether they reflect a bubble. If price developments in the real estate market mirror changes in fundamentals, such as the quality of housing or an adjustment to the underlying fundamentals, the ensuing rise in the stock of credit can be viewed as an equilibrium phenomenon. In contrast, in the event that high credit growth is due to the development of a housing price bubble, the accompanying credit growth is a disequilibrium phenomenon from the point of view of long-term credit stock.

- The degree of liberalization of the financial sector, in particular that of the banking sector. A higher degree of financial liberalization makes it easier for banks to fund credit supply. Because the financial liberalization indices (*finlib*) used in Abiad and Mody (2003) and Cottarelli et al. (2005) only partially match our country and time coverage, we use in addition two variants of the spread between lending and deposit rates ( $spread = i^{lending} / i^{deposit}$  and  $spread2 = i^{lending} - i^{deposit}$ ) to capture financial liberalization.<sup>13</sup> A decrease in the spread indicates financial liberalization and can also reflect more intensive competition among banks and also between banks and other financial intermediaries. It should be noted that the spread variables could also capture other factors than financial liberalization.<sup>14</sup>
- Public and private credit registries (*reg*). The existence of credit registries diminishes problems related to asymmetric information and the probability of credit fraud. This in turn leads to an increase in the supply of bank credit, all things being equal.<sup>15,16</sup>

Our baseline specification includes per capita GDP, bank credit to the public sector, nominal lending rates, inflation rates and financial liberalization based on the spread:

$$C^P = f(CAPITA^+, C^G, i^{lending}, p^{PPI}, spread) \quad (1)$$

where  $C^P$  is bank credit to the private sector expressed as a share of GDP. In addition, it is worthwhile checking whether the robustness of the variables included in equation (1) is affected by the use of alternative measures often used in the literature (e.g. replacing GDP per capita by real GDP growth and real industrial production, or long-term lending rates by short-term lending rates, and the PPI by the CPI). These alternative variables are subsequently

<sup>13</sup> We use the two additional variants to see whether the results are robust to the alternative definitions of the spread, given that the two spread series sometimes display different profiles for the same country.

<sup>14</sup> Note e.g. that the recent decline in the absolute level of spreads may be partly due to record low global interest rates.

<sup>15</sup> In contrast to Cottarelli et al. (2005), for econometric reasons, we do not include a variable that captures the tradition of legal systems of countries, which can affect financial development. The mean group estimator (MGE) estimation methods in section 5 do not allow the use of dummy variables that take a value of zero throughout the entire period.

<sup>16</sup> We are aware of the fact that the registry variable may not capture how credit contracts are enforced in courts. However, even though an easier seizure of collateral by banks may spark credit to households and small firms, such growth will probably be reflected in a one-off spike in growth rates.

introduced one by one in the baseline specification, which yields six additional equations.

$$C^P = f(ip^+, \bar{C}^G, i^{\bar{lending}}, p^{\bar{PPI}}, \bar{spread}) \quad (2)$$

$$C^P = f(gdpr^+, \bar{C}^G, i^{\bar{lending}}, p^{\bar{PPI}}, \bar{spread}) \quad (3)$$

$$C^P = f(CAPITA^+, \bar{C}^G, i^{\bar{short-term}}, p^{\bar{PPI}}, \bar{spread}) \quad (4)$$

$$C^P = f(CAPITA^+, \bar{C}^G, i^{\bar{lending}}, p^{\bar{CPI}}, \bar{spread}) \quad (5)$$

$$C^P = f(CAPITA^+, \bar{C}^G, i^{\bar{lending}}, p^{\bar{PPI}}, \bar{spread}2) \quad (6)$$

$$C^P = f(CAPITA^+, \bar{C}^G, i^{\bar{lending}}, p^{\bar{PPI}}, \bar{finlib}^+) \quad (7)$$

The sensitivity check to the alternative specification is then followed by the use of the registry variable and by the inclusion of housing prices:

$$C^P = f(CAPITA^+, \bar{C}^G, i^{\bar{lending}}, p^{\bar{PPI}}, \bar{spread}, \bar{reg}^+) \quad (8)$$

$$C^P = f(CAPITA^+, \bar{C}^G, i^{\bar{lending}}, p^{\bar{PPI}}, \bar{spread}, p^{\bar{housing}}^+) \quad (9)$$

#### 4.2 Data Sources

Our quarterly dataset covers 43 countries, which are grouped in 3 panels: (1) developed OECD countries, (2) emerging markets from Asia and the Americas,<sup>17</sup> and (3) transition economies from CEE. The OECD panel is further split into 2 subpanels: (1) small OECD countries (excluding transition economies that have joined the OECD),<sup>18</sup> and (2) large OECD countries<sup>19</sup>. The panel of 11 transition economies is also subdivided into 3 presumably more homogeneous groups: (1) the Baltic 3 (B-3): Estonia (EE), Latvia (LV) and Lithuania (LT), (2) the CEE-5: the Czech Republic (CZ), Hungary (HU), Poland (PL), Slovakia (SK) and Slovenia (SI), and (3) the Southeastern European 3 (SEE-3): Bulgaria (BG), Croatia (HR) and Romania (RO).

The sample begins between 1975 and 1980 for the OECD countries, between 1980 and 1993 for the emerging market economies, and between 1990 and 1996 for the transition economies; it ends in 2004.<sup>20</sup> The dataset is

<sup>17</sup> Argentina (AR), Brazil (BR), Chile (CL), India (IN), Indonesia (ID), Israel (IL), Mexico (MX), Peru (PE), Philippines (PH), South Africa (ZA), South Korea (KR) and Thailand (TH). Although South Korea and Mexico are OECD countries, they can be viewed as catching-up emerging market economies for most of the period investigated in this paper.

<sup>18</sup> Austria (AT), Australia (AU), Belgium (BE), Canada (CA), Denmark (DK), Finland (FI), Greece (GR), Ireland (IE), the Netherlands (NL), New Zealand (NZ), Norway (NO), Portugal (PT), Spain (ES) and Sweden (SE).

<sup>19</sup> Germany (DE), France (FR), Italy (IT), Japan (JP), United Kingdom (UK) and the United States (US).

<sup>20</sup> See appendix A for a detailed description of the time span for variables.

unbalanced, as the length of the individual data series depends largely on data availability. All data are transformed into logs, except for spread2.

Data for bank credit to the private sector, credit to the government sector, short-term and long-term interest rate series, the consumer and producer price indices (CPI and PPI), real and nominal GDP, and industrial production are obtained from the International Financial Statistics of the IMF accessed via the database of the Austrian Institute for Economic Research (WIFO).<sup>21</sup> For some emerging markets, industrial production data are not available from this source, and hence are obtained from national data sources. Inflation is computed as a year-on-year rate ( $p_t/p_{t-4}$ ). Lending rates are based on bank lending rates, and wherever not available, long-term government bond yields are used instead. Three-month treasury bill rates, and, wherever not available, money market rates are employed for short-term interest rates. The spread is calculated using lending (or, wherever not available, long-term government bond yields) and deposit rates.

GDP per capita expressed in PPS against the euro and the U.S. dollar is drawn from the AMECO database of the European Commission and the World Economic Indicators of the World Bank, respectively. The data start in 1975 for OECD countries and the emerging markets and in the 1990s for transition economies. The financial liberalization index (from 0 to 20) reported in Abiad and Mody (2003) and used in Cottarelli et al. (2005) is used for OECD and emerging market economies. The data cover the period from 1975 to 1996 and are available for all emerging countries and for nine OECD economies, namely the large OECD countries plus Canada, Australia and New Zealand. For the transition economies, the average of the liberalization index of the banking sector and that of the financial sector provided by the EBRD from 1990 to 2004 are used (rescaled from the range 1 to 4+ to the range 0 to 20, which corresponds to the scaling used in Abiad and Mody, 2003). Data for the existence of public and private credit registries are taken from Djankov et al. (2005), who provide data for 1999 and 2003. The series we use can take three values: 0 in the absence of both public and private registries, 1 if either public or private credit registries are in operation and 2 if both exist. This variable basically captures whether a change between 1999 and 2003 alters the supply of credit during this period. GDP per capita, the financial liberalization index and the registry variable are transformed to a quarterly frequency by means of linear interpolation.

Housing prices are not available for emerging countries and for Italy. For transition economies, data could be obtained only for the Czech Republic, Estonia, Hungary and Lithuania. The data for the OECD economies are obtained from the Macroeconomic Database of the Bank for International Settlements (BIS) and Datastream. The source of the data is the respective central bank for the Czech Republic, France, Hungary and Lithuania and the national statistical office for Estonia.

<sup>21</sup> IFS codes: Bank credit to the private sector: lines 22d and 22g; credit to the government: lines 22a, 22b and 22c; interest rates: lines 60b, 60c, 60l, 60p and 61; CPI and PPI: lines 64 and 63; nominal GDP: lines 99b and 99b.c; real GDP: lines 99bvp and 99bvr; industrial production in industry: lines 66, 66..c and 66ey (in manufacturing).

### 4.3 Estimation Methods

As an introductory step, we undertake a simple cross-sectional analysis based on ordinary least squares (OLS). This is followed by the panel data analysis. We proceed by first checking the order of integration of the series. As the series are found to be mostly nonstationary in levels and stationary in first differences, panel cointegration is employed. Besides pooled and fixed effect OLS (OLS and FE\_OLS), the coefficients of the long-term relationships are derived on the basis of the mean group of individual dynamic OLS estimates (DOLS) and by relying on the mean group of individual estimates based on the error-correction specification of the autoregressive distributed lag (ARDL) process (mean group estimator, MGE) proposed by Pesaran et al. (1999). The dynamic OLS can be written for each member of the panel as follows:

$$Y_{i,t} = \beta_0 + \sum_{i=1}^n \beta_n X_{i,t} + \sum_{i=1}^n \sum_{j=-k_1}^{k_2} \gamma_{i,j} \Delta X_{i,t-j} + \varepsilon_t \quad (10)$$

with  $k_1$  and  $k_2$  denoting, respectively, leads and lags for panel member  $i$ . The error correction form of the ARDL model is given for panel member  $i$  as shown in equation (11) where the dependent variable in first differences is regressed on the lagged values of the dependent and independent variables in levels and first differences:

$$\Delta Y_{i,t} = \beta_0 + \rho(Y_{i,t-1} + \sum_{i=1}^n \beta_n X_{i,t-1}) + \sum_{j=1}^{l_1} \eta_j \Delta Y_{i,t-j} + \sum_{i=1}^n \sum_{j=0}^{l_2} \gamma_{i,j} \Delta X_{i,t-j} + \varepsilon_t \quad (11)$$

where  $l_1$  and  $l_2$  are the maximum lags. The error correction terms obtained from the mean group estimators proposed by Pesaran et al. (1999) are used as tests for cointegration. A negative and statistically significant error correction term is taken as evidence for the presence of cointegration. In all cases, the lag length is obtained using the Schwarz information criterion.

## 5. Results

### 5.1 A Preliminary Look at Cross-Sectional Data

It seems a worthwhile endeavor to see whether the currently prevailing credit-to-GDP levels in the transition economies analyzed in this paper are in line with observed GDP per capita figures. This gives us a first rough idea on the presence of initial under- or overshooting in the transition economies.

For this purpose, the credit-to-GDP ratio is regressed on relative GDP per capita<sup>22</sup> using three sets of cross-sectional data. We first use the dataset of Djankov et al. (2005), which contains data on bank credit to the private sector in percent of GDP (average for 1999 to 2003) and GDP per capita expressed in current U.S. dollars for 2003 for 127 countries. We then use our own dataset, which includes GDP per capita in U.S. dollar PPS for 44 countries and GDP

<sup>22</sup> GDP per capita is expressed relative to German GDP per capita, and both GDP-per-capita and credit-to-GDP ratios are expressed in logarithmic terms. The number of countries is lower when GDP per capita in euro is used because those figures are mostly not available for emerging markets (only for the OECD members Mexico and South Korea).

per capita in euro PPS for 35 countries, using averages for the period 2002 to 2004.

For the large dataset covering 127 countries, several groups of countries which exclude all or some of the transition economies are built. Also, nontransition economies are grouped into low-, middle- and high-income countries. Finally, cross-sectional regressions are run for all transition economies and then separately for the CIS and for the CEE countries. In our dataset, we use groups similar to those used for the panel data analysis: developed OECD countries, emerging countries and transition countries.

The results displayed in table 2 have several interesting features, which turn out to be fairly robust across the three datasets. First, no significant cross-sectional relationship seems to emerge for developed OECD countries and middle-income emerging market economies, irrespective of the dataset used. Second, the relationship between the credit-to-GDP ratio and GDP per capita is found to be very significant both for nontransitional low-income countries and for transitional economies. The relationship is also statistically significant when all countries are pooled together. Finally, the coefficient on GDP per capita is higher for transition economies, in particular for countries of CEE, than for the rest of the countries.

Table 2

### Cross-Sectional Bivariate Regressions

$$C^p = f(CAPITA^+)$$

	CONSTANT	CAPITA	R2	SIC	AIC	OBS
GDP per capita in U.S. dollars (Djankov et al. (2005) dataset)						
All	-0.069	0.505***	0.59	2.17	2.12	127
All (excl. transition economies)	0.037	0.504***	0.62	2.14	2.09	105
All (excl. CEE)	-0.001	0.516***	0.6	2.19	2.14	117
Poor (< USD 1,000)	0.431	0.599***	0.16	2.41	2.33	46
Middle (USD 1,000 < X < USD 10,000)	-0.491	0.27	0	2.53	2.43	33
Rich (>USD 10,000)	0.024	0.183	0.01	0.52	0.42	26
Transition economies all	-0.291	0.629***	0.57	1.58	1.48	22
CIS	-0.402	0.586*	0.21	1.95	1.87	12
CEE	0.092	0.876***	0.52	1.24	1.18	10
GDP per capita is U.S. dollars. PPS (dataset of this paper)						
All	-0.419*	0.572**	0.09	3.22	3.13	44
OECD + emerging economies	-0.371	0.504	0.05	3.5	3.41	33
Emerging economies	-0.945	0.182	-0.09	2.26	2.19	11
OECD	-0.349	-0.451	-0.05	3.87	3.77	22
CEE-11	-0.435	0.839**	0.29	1	0.93	11
GDP per capita in euro. PPS (dataset of this paper)						
All	-0.387	0.917**	0.1	3.39	3.3	35
OECD + emerging economies	-0.378	0.898	0.01	3.81	3.71	24
OECD	-0.3	-0.274	-0.05	3.88	3.78	22
CEE-11	-0.521	0.781*	0.24	1.07	1	11

Source: Authors' calculations.

Note: Middle-income countries exclude transition economies. R2 is the adjusted R-squared, SIC and AIC stand for the Schwarz and Akaike information criterion, and OBS shows the number of observations used for the respective regression. \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% significance levels, respectively. The CEE-11 cover Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

It is rather convenient to use the estimation results reported in table 2 to derive the deviation of private credit-to-GDP ratios from their equilibrium levels for the period from 1990 to 2004. In order to avoid the bias induced by the process of transition, the results obtained for the large sample excluding all transition economies (both CEE and CIS countries)<sup>23</sup> are applied to compare the observed and fitted values of the private credit-to-GDP ratio for the transition economies under study. As plotted in chart 3, the private credit-to-GDP ratio had reached and even surpassed its equilibrium level in Estonia, Latvia and also in Croatia by 2004, at least according to these cross-sectional estimations. In Hungary, Slovenia and Lithuania, it has started to adjust from an initial position below equilibrium toward equilibrium, even though it has not reached equilibrium yet.

Bulgaria, the Czech Republic and Slovakia appear to have entered transition with private credit-to-GDP ratios above equilibrium, but these countries also experienced a rapid undershooting during the mid-1990s. Of these three economies, only Bulgaria has recently come close to equilibrium, while the Czech Republic and Slovakia remain fundamentally below equilibrium, at least according to the cross-sectional estimations.

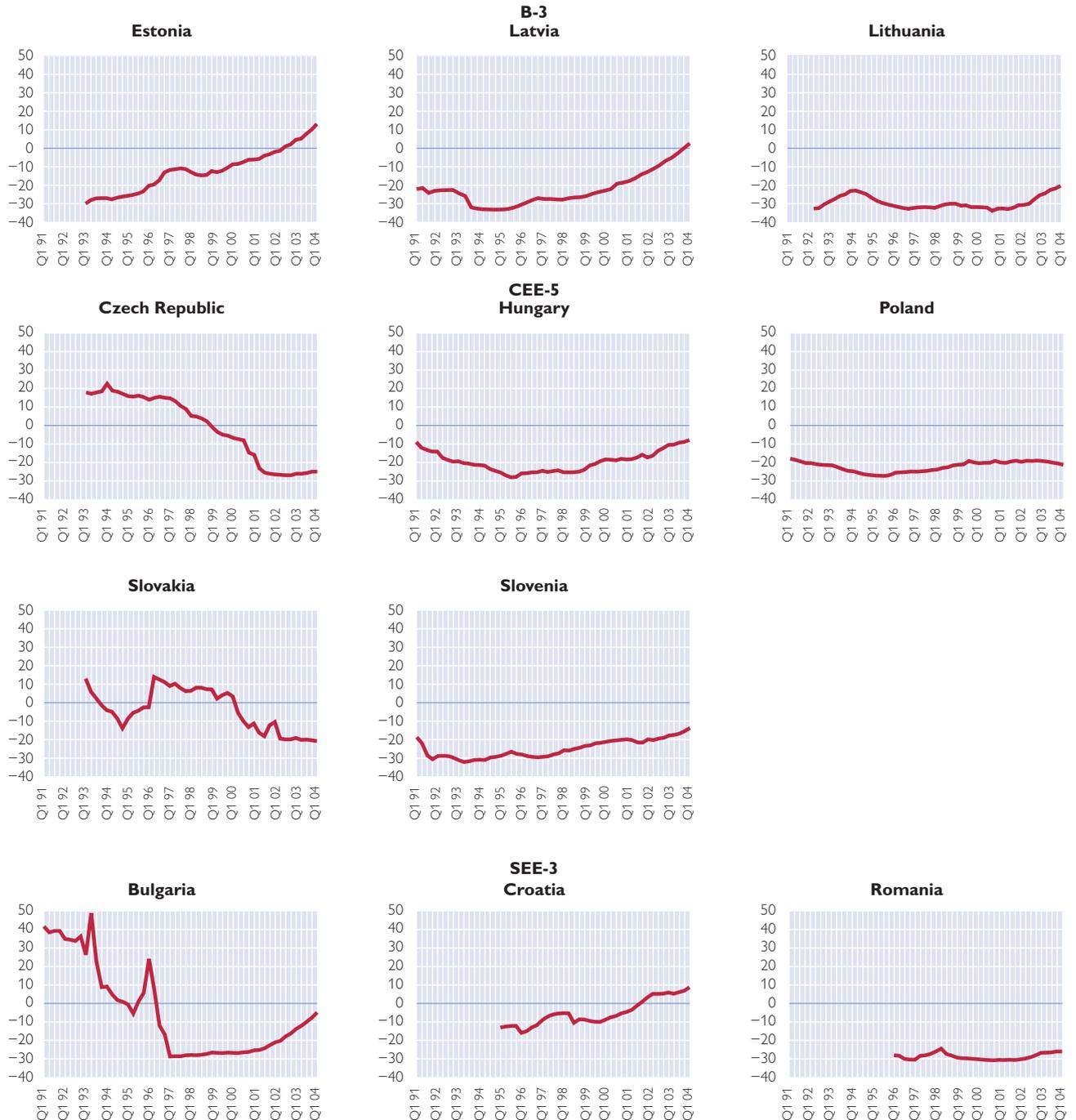
As already noted earlier, an initial under- or overshooting has severe consequences for econometric estimations, if a steady but still longer-lasting adjustment process takes place. This definitely seems to be the case in Estonia, Latvia and Croatia, and also perhaps in Hungary and Slovenia. On the other hand, initial undershooting might not be a serious problem for Lithuania, Poland and Romania because the deviation from equilibrium remained pretty stable over the time horizon considered. For Bulgaria, the Czech Republic and Slovakia, the bias may be also less of a concern, given that periods of over- and undershooting roughly average each other out, and thus no permanent over- or undershooting can be observed. This notwithstanding, given that all subpanels (CEE-5, B-3 and SEE-3) contain countries displaying a possibly protracted period of undershooting, results obtained from in-sample panels should be interpreted with a high degree of caution.

<sup>23</sup> Second equation from above in table 2 (*ALL(no-transition)*).

**Deviations from Long-Run Equilibrium Credit-to-GDP Ratios Based on Cross-Sectional Estimates,**

**1990 to 2004**

in %



Source: Authors' calculations.

Note: B-3 covers Estonia, Latvia and Lithuania; CEE-5 covers the Czech Republic, Hungary, Poland, Slovakia and Slovenia; SEE-3 covers Bulgaria, Croatia and Romania. Negative values indicate that the observed private credit-to-GDP ratio is lower than what a particular country's GDP per capita would predict ("undershooting"). Conversely, positive figures show an "overshooting" of the private credit-to-GDP ratio. Figures refer to differences in percentage points (e.g. 0.5=50%).

## 5.2 Panel Data Analysis

When analyzing possible long-term relationships between the private credit-to-GDP ratio on the one hand and the explanatory variables on the other, one first has to make sure that the variables are cointegrated. As explained earlier, the error correction terms issued from the estimated error correction form of the MGE are used for this purpose. The variables are connected via a cointegrating vector in the event that the error correction term is statistically significant and has a negative sign. According to results shown in table 3 below, most of the error correction terms fulfill this double criterion. A notable exception is the panel composed of the three Baltic states, as there seems to be only one cointegration relationship out of the eight tested equations. For the panel comprising countries from Southeastern Europe, no cointegration could be established for equation 6.

Table 3

### Cointegration – Error Correction Terms, Equation 1 to Equation 8

	Large OECD	Small OECD	Emerging economies	CEE-11	CEE-5	B-3	SEE-3
Equation 1	-0.094***	-0.063***	-0.132***	-0.281***	-0.225***	-0.103	-0.551***
Equation 2	-0.088***	-0.052***	-0.135***	-0.174***	-0.188***	-0.052	-0.273***
Equation 3	-0.092***	-0.055***	-0.202***	-0.188***	-0.183***	-0.135**	-0.248***
Equation 4	-0.097***	-0.069***	-0.189***	-0.226***	-0.136***	-0.049	-0.553***
Equation 5	-0.097***	-0.057***	-0.215***	-0.198***	-0.207***	-0.066	-0.315***
Equation 6	-0.106***	-0.060***	-0.098***	-0.128***	-0.268***	-0.036	-0.013
Equation 7	-0.160***	-0.049**	-0.211***	-0.233***	-0.269***	-0.12	-0.285**
Equation 8	-0.98***	-0.003**	-0.134***	-0.227***	-0.231***	-0.033	-0.414**

Source: Authors' calculations.

Note: \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% significance levels, respectively. The CEE-11 cover Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia, the CEE-5 the Czech Republic, Hungary, Poland, Slovakia and Slovenia, the SEE-3 Bulgaria, Croatia and Romania.

We can now turn to the coefficient estimates, which are displayed in table 4 and in the appendix. GDP per capita enters the long-run relationship with the expected positive sign for the OECD and the emerging markets panels. This result is particularly robust for small OECD and emerging market economies, with the size of the coefficient usually lying somewhere between 0.4 and 1.0 for most of the alternative specifications. However, less robustness is found for the transition countries. This holds especially true for the CEE-5, for which GDP per capita turns out to be insignificant both in the baseline and in alternative specifications. Although cointegration could not be firmly established for the Baltic countries, it is worth mentioning that GDP per capita is usually statistically significant for this group as well as for the SEE-3. The fact that the coefficients' size largely exceeds unity reflects the upward bias due to quick adjustment toward equilibrium. The results furthermore indicate that the bias is substantially larger for the Baltic countries than for the SEE-3.

With regard to credit to the public sector, the estimations provide us with some interesting insights, as an increase (decrease) in credit to the public sector is found to cause a decline (rise) in private credit. This result is very robust for emerging market economies and for the CEE-5, as the coefficient estimates are almost always negative and statistically significant across different specifications. This lends support to the crowding-out/crowding-in hypothesis in

these countries. Some empirical support for this hypothesis can be also established for the advanced OECD and for emerging market economies. By contrast, the estimated coefficients are either not significant or have a positive sign for the Baltic countries and for the SEE-3. This finding might mirror in particular the very low public indebtedness of the three Baltic countries.

Let us now take a closer look at the nominal interest rate and at the inflation rate. In accordance with the results shown in table 4 and in the appendix, there is reasonably robust empirical support for nominal lending rates being negatively linked to private credit in the CEE-5 as well as in emerging markets and small OECD countries. In contrast, the finding for the Baltic states and the SEE-3 is that interest rates mostly have a positive sign, if they turn out to be statistically significant. Note that these results are not really affected by the use of lending rates or short-term interest rates.

For emerging economies from Asia and the Americas, particularly strong negative relationships are detected between the rate of inflation and private credit. Although less stable across different specifications and estimation methods, this negative relationship between inflation and credit is also supported by the data for the CEE-5 and for small OECD economies. By contrast, no systematic pattern could be revealed for the Baltic and Southeastern European countries.

An increase in financial liberalization, measured by (a decline in) spread and spread<sup>2</sup>, has the expected positive impact on private credit in small OECD economies and in the CEE-5, and also to some extent in the other transition economies. By contrast, the results for the financial liberalization index are less robust. Although the financial liberalization index is positively associated with private credit in OECD and emerging economies, it has an unexpected negative sign for all transition economies. An explanation for this may be the delay with which financial liberalization measured by this index is transmitted to private credit, whereas the spread variable captures the effective result of financial liberalization. The same mismatch between OECD and transition economies can be seen for private and public credit registries. While changes in credit registries produce the expected effect on private credit in OECD countries, the estimation results show the opposite happening in the transition economies.

Table 4

Estimation Results – Baseline Specification					
$C^p = f(CAPITA^+, \bar{C}^G, \bar{i}^{lending}, \bar{p}^{PPI}, \bar{spread})$					
	CAPITA	C <sup>G</sup>	i <sup>lending</sup>	p <sup>PPI</sup>	spread
<b>Large OECD</b>					
OLS	2.602***	-0.290***	2.986***	5.637***	-0.672***
FE_OLS	0.422***	-0.198***	-0.028	-0.394*	-0.050***
DOLS	0.391***	-0.034***	0.120***	0.241	0.171***
MGE	0.04	0.118	-0.016	-2.611**	0.207*
<b>Small OECD</b>					
OLS	0.256***	-0.007	-0.173***	-2.160***	-0.102***
FE_OLS	0.480***	-0.170***	-0.068***	-0.178	-0.037***
DOLS	0.540***	-0.065***	-0.082	0.678***	-0.143***
MGE	0.643***	0.057	-0.171	-1.272	0.281
<b>Emerging economies</b>					
OLS	0.362***	-0.212***	0.086***	-0.212**	0.163***
FE_OLS	0.492***	-0.120***	0.136***	-0.263***	0.069**
DOLS	0.715***	-0.064***	0.187***	-0.436***	-0.001
MGE	0.583***	-0.386***	0.454	-0.492***	-1.172
<b>CEE-11</b>					
OLS	0.906***	0.222***	-0.019	0.12	0.002
FE_OLS	1.648***	0.053**	0.297***	-0.046	-0.640***
DOLS	0.981***	-0.169***	0.125	-0.105	-0.382***
MGE	2.043	-0.114	-0.027***	-0.263	-0.907**
CEE-5					
OLS	0.052	-0.346***	-0.225***	-1.235***	-0.028
FE_OLS	0.169	-0.276***	-0.031	-1.179***	-0.407***
DOLS	0.375***	-0.308***	-0.046	1.062***	-0.109*
MGE	-1.076	-0.222***	-0.057***	1.501	-0.985**
<b>B-3</b>					
OLS	1.926***	-0.055	0.136	0.507	-0.505***
FE_OLS	2.554***	0.024	0.369***	0.396*	-0.458***
DOLS	2.227***	-0.121	0.083**	-1.676***	-0.481***
MGE	4.045	0.313	-0.124***	-2.852	-1.466
<b>SEE-3</b>					
OLS	1.356***	0.775***	-0.002	-0.057	0.076
FE_OLS	2.049***	0.455***	0.218***	-0.102**	-0.366***
DOLS	0.745***	0.013	-0.298	-0.479	-0.737***
MGE	1.654***	0.264	0.12	-0.616**	0.217

Source: Authors' calculations.

Note: \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% significance levels, respectively. OLS stands for ordinary least squares, FE\_OLS for fixed effect OLS, DOLS for dynamic OLS and MGE for mean group estimator. The CEE-11 cover Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia, the CEE-5 the Czech Republic, Hungary, Poland, Slovakia and Slovenia, the SEE-3 Bulgaria, Croatia and Romania.

Because data on housing prices are available only for developed OECD countries and for four transition economies (the Czech Republic, Estonia, Hungary and Lithuania), the estimations are performed only for large and small OECD and transition economies. In addition, we constructed a panel including countries exhibiting large and persistent increases in housing prices over the late 1990s, possibly indicating the build-up of a real estate bubble (Canada, Spain, France, the U.K. and the U.S.A.). The results are not particularly robust for the small and large OECD economies, as the coefficient on housing prices changes sign across different estimation methods. For transition economies, even though the results are somewhat more encouraging, as the

coefficient is always positively signed if it is found to be statistically significant, the estimated equations seem to be rather fragile in general.

Now, if we look at the group of countries with large increases in housing prices, it turns out that housing prices are positively correlated in a robust fashion with private credit, and that the other coefficient estimates are also in line with our earlier findings. However, the fact that the inclusion of housing prices yields robust results only if large increases have taken place on the property markets might suggest that housing prices mostly matter for private credit in the event of possible housing market bubbles.

Table 5

**Estimation Results – Equation 9, Housing Prices**

	ECT	CAPITA	C <sup>G</sup>	i <sup>lending</sup>	p <sup>PPI</sup>	spread	p <sup>housing</sup>
<b>Small OECD</b>	OLS	-0.123***	0.003	-0.323***	-0.655**	-0.143***	0.482***
	FE_OLS	0.611***	-0.166***	-0.098***	-0.125	-0.01	-0.062**
	DOLS	0.286***	-0.064	-0.043	0.086	-0.081	0.399***
	MGE	-0.207***	0.033	0.203***	-0.277**	-0.548	-0.08
<b>Large OECD</b>	OLS	3.964***	-0.536***	3.612***	3.942*	-0.461**	-2.046***
	FE_OLS	0.078*	-0.209***	-0.022	-0.855***	0.007	0.290***
	DOLS	0.395***	-0.079***	-0.041*	-0.345	-0.04	-0.161**
	MGE	-0.181***	-0.36	-0.049	-0.097*	-2.397***	0.139
<b>OECD with high growth in housing prices</b>	OLS	-0.842***	0	-0.113***	-2.081***	0.06	1.269***
	FE_OLS	0.111*	-0.160***	-0.066**	-0.787***	-0.025	0.336***
	DOLS	0.334***	-0.171***	-0.043**	-0.412	0.022	0.040*
	MGE	-0.176***	-0.838	-0.146***	-0.235**	-2.404**	0.432*
<b>CEE-4</b>	OLS	2.064***	-0.374***	0.472***	-0.528	-0.223***	0.019
	FE_OLS	0.316	-0.429***	0.032	-0.603***	-0.096	0.541***
	DOLS	0.010***	-0.042***	0.05	-0.563**	0.002	-0.018
	MGE	-0.125***	-0.651	-0.136***	-0.599***	0.08	-0.359

Source: Authors' calculations.

Note: ECT is the error correction term. \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% significance levels, respectively. OLS stands for ordinary least squares, FE\_OLS for fixed effect OLS, DOLS for dynamic OLS and MGE for mean group estimator. CEE-4 includes the Czech Republic, Estonia, Hungary and Lithuania.

**5.3 How Close to Equilibrium?**

We can now proceed with the calculation of the fitted values from the panel estimations for the transition economies. This exercise makes it possible to see how far away the observed private credit-to-GDP ratio is from the estimated long-term value. We showed earlier (chart 3) that most of the transition economies had a large initial undershooting followed by a steady adjustment toward equilibrium. This preliminary finding cautions against the use of in-sample panel estimates, as both the estimated long-run coefficients and the constant terms are possibly biased because of the steady adjustment toward equilibrium. But not only the upward bias prevents us from relying on the in-sample panel estimations. As tables 4 and 5 and in the appendix show, there is no single equation for transition economies in which all coefficients are statistically significant and have the expected sign. Because the same applies to the emerging markets panel, we derive the estimated equilibrium private credit-to-GDP ratios from the OECD panels. The baseline specification estimated by means of fixed effect OLS appears to be best suited, as all coefficients bear the right sign and all but one are statistically significant (marked in blue in table 4).

When engaging in an out-of-sample exercise, the underlying assumption is that in the long run there is parameter homogeneity between the small developed OECD panel and the transition countries. One might reasonably assume that in the long run (after adjustment toward equilibrium is completed) the behavior of transition economies will be similar to the present behavior of small OECD countries. Even though this homogeneity is fulfilled between the two samples, the estimated long-run values of the private credit-to-GDP ratio and the underlying deviation from equilibrium should be interpreted from a long-run perspective.

Given that no country-specific constant terms are available for the transition economies, the next intricate issue is how constant terms should be applied to derive the fitted values.<sup>24</sup> Our safest bet is to use the largest and the smallest constant terms (as well as the median constant term) obtained on the basis of the small OECD panel, which gives us the whole spectrum of possible estimated values for private credit.<sup>25</sup>

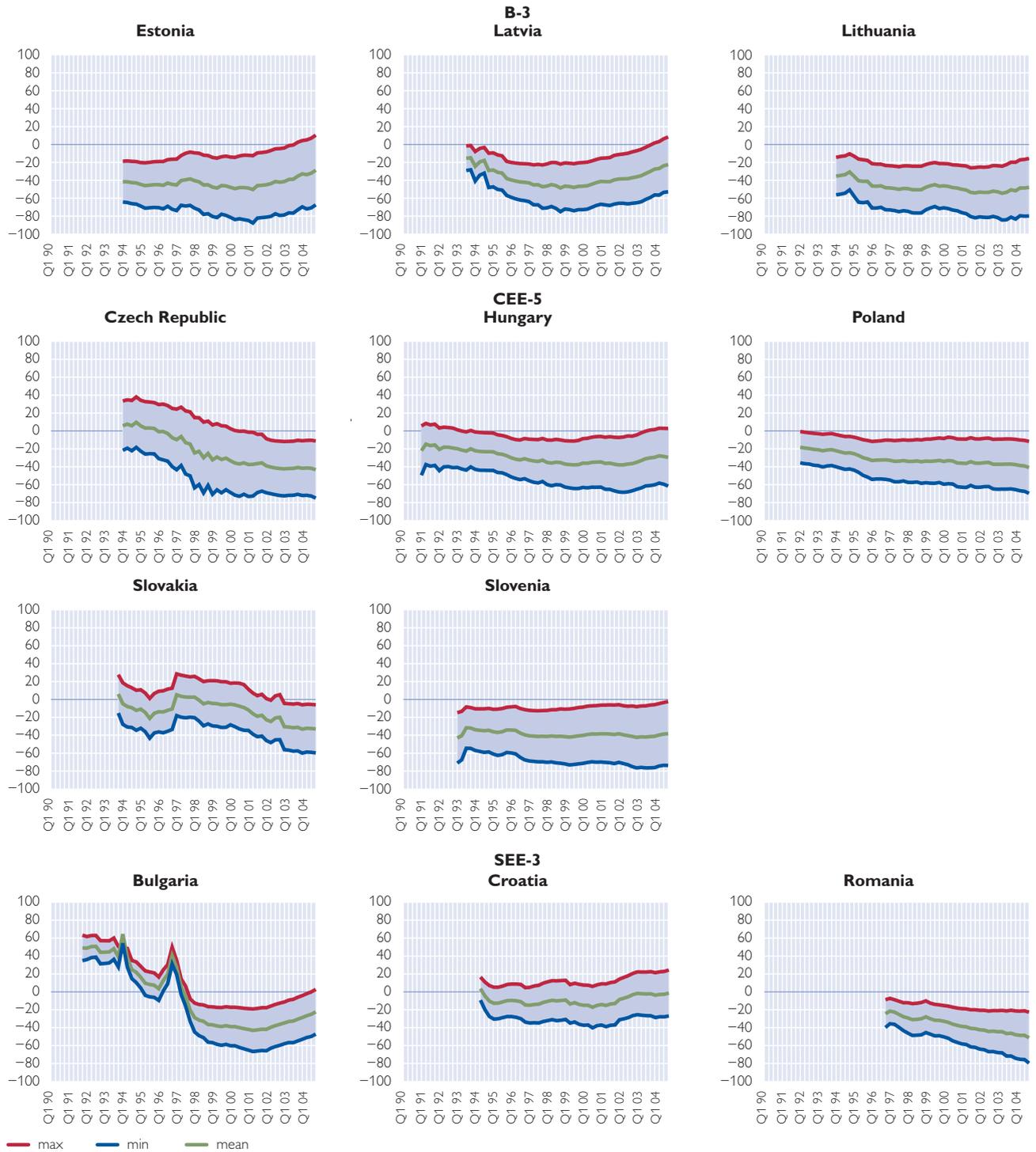
The derived range of deviation is plotted on chart 4. The dynamics of the results is fairly similar to that obtained using cross-sectional estimates. However, the error margin is rather large. Consequently, if one considers mid-points, Croatia is now the only country which might have reached equilibrium by 2004. When looking at whole ranges, other countries, namely Bulgaria, Estonia, Hungary, Latvia and Slovenia, might have already reached equilibrium as well, while the mass of the estimated deviation is still located mostly on the undershooting side in 2004. At the same time, the upper edges of the estimated band come close to equilibrium for Hungary, Bulgaria, Poland and Slovenia. Moreover, it turns out that the initial overshooting might not have been that large for the Czech Republic and Slovakia, after all. Finally, it is interesting to see that the initial undershooting remains relatively stable for Lithuania and Romania, and also perhaps for Poland throughout the period.

<sup>24</sup> Note that Cottarelli et al. (2005), the only paper which derives the equilibrium level of private credit for transition economies, does not address the issue of the constant terms.

<sup>25</sup> Another reason for selecting the baseline specification is that the variables included are all expressed in levels, which ensures that the constant terms derived on this basis have a cross-sectional meaning. For instance, the constants would not have any cross-sectional meaning if indices with a base year were used (such as for industrial production or housing prices).

**Deviations from Long-Run Equilibrium Credit-to-GDP Ratios Based on Panel Estimates, 1990 to 2004**

in %



Source: Authors' calculations.

Note: B-3 covers Estonia, Latvia and Lithuania; CEE-5 covers the Czech Republic, Hungary, Poland, Slovakia and Slovenia; SEE-3 covers Bulgaria, Croatia and Romania. Negative values indicate that the observed private credit-to-GDP ratio is lower than what a particular country's GDP per capita would predict ("undershooting"). Conversely, positive figures show an "overvaluation" of the private credit-to-GDP ratio.

## 6 Conclusion

In this paper, we have analyzed the equilibrium level of private credit to GDP in 11 transition economies from CEE on the basis of a number of dynamic panels containing quarterly data for developed OECD economies, emerging markets and transition economies and relying on a unifying framework including both factors capturing the demand for and the supply of private credit.

We have emphasized that relying on in-sample panel estimates for transition economies is problematic not only because of the possible bias which shows up in the estimated constants and slope coefficients due to the initial undershooting and the ensuing steady adjustment toward equilibrium, but also because the equations estimated for transition economies are not sufficiently stable. Credit to the public sector (crowding out/crowding in), nominal interest rates, the inflation rate and the spread between lending and deposit rates aimed at capturing financial liberalization and competition in the banking sector turn out to be the major determinants of credit growth in the CEE-5, while GDP per capita is the only variable entering the estimated equations in a robust manner for the Baltic and Southeastern European countries. The estimated coefficients are much higher than those obtained for OECD and emerging market economies, which testifies to the bias caused by the initial undershooting of private credit to GDP (in most countries) and the subsequent adjustment toward equilibrium in those countries. Housing prices are found to lead to an increase in private credit only in countries with high housing price inflation. This finding disqualifies the housing price variable from being included in the long-run equation to be used for the derivation of the equilibrium level of private credit.

Our intention to use the emerging markets panel is thwarted by the lack of robustness of the empirical results for emerging economies. This is why we primarily rely on the small OECD panel in the further analysis. The application of this out-of-sample panel to transition economies provides us with a wide corridor of deviations from equilibrium. Overall, while some countries, such as Lithuania and Romania, have private credit-to-GDP ratios which are well below the level the fundamentals would justify, others had already come close to equilibrium by 2004. Although the estimated band is mostly on the undershooting side, the rapid adjustment that is observed in Croatia, Estonia, Latvia and possibly Bulgaria might surpass equilibrium and lead to the emergence of (over)shooting instances in the near future.

It has been argued that credit growth will very likely remain fast in CEE or accelerate further in those countries where it is still comparatively moderate, given that the underlying factors which support private sector credit dynamics will remain at work for some time to come. As experience shows, the rapid pace of credit expansion and its persistence in a number of countries does by itself pose the risk of a deterioration of asset quality. Moreover, it exposes lenders and borrowers to risks because of an increase in unhedged foreign currency lending. Furthermore, the rapid adjustment process toward equilibrium levels may trigger demand booms, causing current account deficits to move above levels that can be sustained over a longer period of time. However, we leave it to future research to determine empirically the optimal speed of adjustment toward equilibrium that does not jeopardize macroeconomic and financial stability.

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## 8. Appendix

### 8.1 Data Appendix

Starting dates (the series end in 2004:Q4 unless indicated otherwise)

Private credit (the same applies to public credit unless indicated otherwise in parentheses):

*OECD*: 1975:Q1 to 2004:Q4.

*Emerging markets*: 1975:Q1 to 2004:Q4 except for AR: 1982:Q3 (1983:Q3); BR: 1988:Q3 (1989:Q3); ID: 1980:Q3; PE: 1984:Q1 (1985:Q1).

*Transition economies*: HU, PL: 1990:Q4; BG, EE, SI: 1991:Q4; LT: 1993:Q1; LV: 1993:Q3; CZ, SK: 1993:Q4; HR: 1993:Q4 (1994:Q2); EE: 1991; RO: 1996:Q4.

#### Spread:

*OECD*: 1975:Q1 except for DE: 1977:Q3; NO: 1979:Q1; IE: 1979:Q3; FI, NL: 1981:Q1; NZ: 1981:Q4; ES: 1982:Q1; IT: 1982:Q3.

*Emerging markets*: ID, KR, PH: 1975:Q1; CL, TH: 1977:Q1; ZA: 1977:Q4; IN, MX: 1978:Q1; IL: 1983:Q1; PE: 1988:Q1; AR: 1993:Q2; BR: 1997:Q1.

*Transition economies*: HU, PL: 1990:Q1; BG: 1991:Q1; SI: 1991:Q4; HR: 1992:Q1; CZ, LT, SK: 1993:Q1; EE: 1993:Q2; LV: 1993:Q3; RO: 1995:Q4.

#### PPI (in parentheses CPI and industrial production (IP) if time span different):

*OECD*: 1975:Q1 except for PPI in NO, NZ: 1977:Q1; BE: 1980:Q1; IT: 1981:Q1.

*Emerging markets*: 1975:Q1 except for AR: 1987:Q1 (1994:Q1; not available); BR: 1992:Q1 (1992:Q1, 1991:Q1); CL: 1976:Q1 (1976:Q1, 1975:Q1); ID: IP:1976:Q1; IL: IP not available; KR IP: 1980:Q1; PE: 1980:Q1 (1980:Q1, 1979:Q1); PH: 1993:Q1 (1975:Q1, 1981:Q1).

*Transition economies*: BG: 1991:Q1; CZ: 1993:Q1; HR: 1993:Q1; EE: 1993:Q1 (1992:Q1, 1993:Q1); HU: 1990:Q1; LV: 1994:Q1 (1992:Q1, 1993:Q1); LT: 1993:Q1; PL: 1991:Q1; RO: 1992:Q1; SK: 1991:Q1 (1993:Q1, 1990:Q1); SI: 1992:Q1.

#### Real GDP:

*OECD*: 1975:Q1 except for BE: 1980:Q1; DK, PT: 1977:Q1; NZ: 1982:Q2.

*Emerging markets*: IN, IL, KR: 1975:Q1; CL, MX: 1980:Q1; PE: 1979:Q1; PH: 1981:Q1; BR: 1990:Q1; AR, ID, TH: 1993:Q1.

*Transition economies*: SI: 1992:Q1; HR, EE, LV, LT, RO, SK: 1993:Q1; CZ: 1994:Q1; HU, PL: 1995:Q1; data for IN and RO are linearly interpolated from annual to quarterly frequency.

All series stop in 2004:Q4.

#### GDP per capita in PPS:

Data based on the euro for *transition economies*: CZ, PL, RO: 1990; BG, HU, SI: 1991; LV, LT: 1992; EE, SK: 1993; HR: 1995.

Data based on the U.S. dollar for *transition economies*: HR, HU, PL, RO: 1990; BG, EE, LV, LT, SK, SI: 1991; CZ: 1992.

**Housing prices:**

*OECD:* The starting date of the series is as follows: DK, DE, NL, UK, US: 1975:Q1; JP: 1977:Q1; ZA: 1980:Q1; FR: 1980:Q4; CA: 1981:Q1; FI: 1983:Q1; SE: 1986:Q1; AU: 1986:Q2; ES: 1987:Q1, AT: 1987:Q2; PT: 1988:Q1; NZ: 1989:Q4; IE: 1990:Q1; BE, NO: 1991:Q4; GR: 1994:Q1. The series stop in 2004:Q4.

*Transition economies:* CZ: 1999:Q1 to 2004:Q4; EE: 1994:Q2 to 2004:Q4; HU: 1991:Q1 to 2004:Q4; LT: 2000:Q1 to 2004:Q4.

8.2 Estimation Results

Table A1

Estimation Results – Equation 2 and 3										
	ip	C <sup>G</sup>	i <sup>lending</sup>	p <sup>PPI</sup>	spread	gdpr	C <sup>G</sup>	i <sup>lending</sup>	p <sup>PPI</sup>	spread
<b>Large OECD</b>										
OLS	4.799***	-0.609***	3.367***	-0.444	-0.229	0.089***	-0.733***	3.033***	-4.442**	0.026
FE_OLS	0.655***	-0.206***	-0.031	-1.643***	0.013	0.557***	-0.202***	-0.055*	-1.296***	-0.026
DOLS	0.925***	0.018	0.143***	-0.635***	0.120***	0.700***	0.023	0.184***	-0.897***	0.158***
MGE	0.39	0.13	0.056	-3.480***	0.364**	0.067	0.119	-0.022	-2.406**	0.316*
<b>Small OECD</b>										
OLS	0.405***	-0.033***	-0.210***	-2.423***	-0.067***	0.512***	0.037***	-0.107***	-1.111***	-0.051***
FE_OLS	0.767***	-0.115***	-0.089***	-0.888***	-0.134***	1.163***	-0.099***	0.029*	-0.334***	-0.108***
DOLS	1.113***	-0.011	0.029**	0.024	0.038**	1.272***	0.036**	0.038***	0.306***	-0.119
MGE	2.533***	0.254*	0.024	-2.903*	0.945**	2.111***	0.018	0.101	-1.169	0.458
<b>Emerging economies</b>										
OLS	0.375***	-0.200***	-0.153***	-0.311**	-0.224***	0.172***	-0.208***	0.059	0.066	0.116**
FE_OLS	0.483***	-0.097***	0.078***	-0.416***	-0.003	0.419***	-0.119***	0.097***	-0.150**	0.019
DOLS	0.589***	-0.006***	0.077***	-0.503***	-0.201***	0.729***	-0.030***	0.133***	-0.212*	-0.148***
MGE	0.502***	-0.253***	0.867	-0.333***	-0.555	0.109***	-0.089***	0.885**	-0.908**	-0.986
<b>CEE-11</b>										
OLS	-0.244**	0.317***	-0.462***	0.072	-0.263***	-0.263	0.209***	-0.535***	-0.512**	-0.221***
FE_OLS	0.918***	0.079**	-0.044	0.04	-0.651***	1.972***	-0.200***	0.071	0.129	-0.331***
DOLS	0.857***	-0.151***	0.062	-0.647***	-0.202***	1.957***	0.09	0.212***	-0.182*	-0.155***
MGE	0.228	-0.49	-1.018	-1.013**	-0.949	4.441***	0.32	-0.275	-1.563**	0.687
<b>CEE-5</b>										
OLS	-0.207	-0.338***	-0.266***	-1.694***	-0.059	-0.231	-0.316***	-0.275***	-1.793***	-0.112
FE_OLS	-0.105	-0.293***	-0.181**	-1.202***	-0.379***	0.639***	-0.282***	-0.086	-1.018***	-0.472***
DOLS	0.158	-0.347***	-0.05	0.848***	-0.121**	0.980***	-0.109	0.089	1.012***	-0.198***
MGE	-1.088*	-0.467***	-0.830**	1.030	-1.157	0.83	0.065	-0.067***	0.056	-0.587*
<b>B-3</b>										
OLS	1.063***	-0.256***	-0.493***	1.273***	-0.486***	2.167***	-0.284***	-0.132	1.116***	-0.413***
FE_OLS	1.589***	-0.004	-0.290***	0.621*	-0.463***	2.771***	0.006	0.128	0.411	-0.376***
DOLS	1.905***	-0.087	0.371***	-3.927***	0.709***	3.169***	-0.076	0.423***	-1.885***	-0.184
MGE	1.198	2.772**	-2.259	-3.632***	0.827	12.374**	1.258*	-0.757	-4.716***	-1.985
<b>SEE-3</b>										
OLS	1.192***	0.777***	-0.079	-0.103	0.265***	0.954***	0.426***	-0.403***	-0.397***	0.249***
FE_OLS	0.908***	0.096	-0.729	0.166	-1.349***	3.464***	0.129	0.308**	-1.920***	0.159
DOLS	0.973***	0.11	-0.682	0.14	-1.247***	3.464***	0.129	0.308**	-1.920***	0.159
MGE	2.174**	-0.197	0.091	-1.799	0.722	4.023***	-0.145	0.431	-2.743**	0.231

Source: Authors' calculations.

Note: \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% significance levels, respectively. OLS stands for ordinary least squares, FE\_OLS for fixed effect OLS, DOLS for dynamic OLS and MGE for mean group estimator. The CEE-11 cover Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia, the CEE-5 the Czech Republic, Hungary, Poland, Slovakia and Slovenia, the SEE-3 Bulgaria, Croatia and Romania.

Table A1 – cont.

**Estimation Results – Equation 4 and 5**

	capita	C <sup>G</sup>	i <sup>short-term</sup>	p <sup>PPI</sup>	spread	capita	C <sup>G</sup>	i <sup>lending</sup>	p <sup>CPI</sup>	spread
<b>Large OECD</b>										
OLS	2.910***	0.158	0.632***	12.095***	-1.300***	2.372***	-0.309***	3.172***	0.146	-0.661***
FE_OLS	0.426***	-0.202***	0.027	-0.520**	0.005	0.362***	-0.201***	0.037	-1.687***	-0.024
DOLS	0.412***	-0.002***	0.071***	0.122	0.206**	0.361***	-0.025***	0.177***	-0.681**	0.155***
MGE	0.007	0.147	0.097	-2.471**	0.288***	0.044	0.15	0.088	-2.788***	0.198**
<b>Small OECD</b>										
OLS	0.295***	-0.017*	-0.152***	-1.871***	-0.099***	0.386***	0	-0.273***	0.916***	-0.106***
FE_OLS	0.501***	-0.177***	-0.054***	-0.173	-0.045***	0.544***	-0.157***	-0.110***	1.181***	-0.039***
DOLS	0.447***	-0.085***	-0.105***	0.741***	-0.112***	0.626***	-0.002***	-0.149***	1.645***	-0.165***
MGE	0.686***	0.045	-0.06	-0.103	0.222	0.756***	0.573*	-0.165	-1.196	-0.592
<b>Emerging economies</b>										
OLS	0.358***	-0.244***	0.038*	0.02	0.217***	0.388***	-0.204***	0.111***	-0.409***	0.137***
FE_OLS	0.508***	-0.237***	0.004	0.115*	0.112***	0.485***	-0.082***	0.143***	-0.414***	0.065*
DOLS	0.621***	-0.049***	-0.089	0.319*	0.023	0.716***	-0.032***	0.041*	-0.327***	-0.018
MGE	0.426***	-0.521***	-0.36	-0.852	-1.352	0.813***	-0.034***	0.239	-1.171***	-0.176
<b>CEE-11</b>										
OLS	1.074***	0.180***	0.145***	0.028	0.213***	0.936***	0.224***	-0.038	0.209**	0.005
FE_OLS	1.352***	0.090***	0.131***	0.002	-0.618***	1.731***	0.045*	0.295***	-0.033	-0.663***
DOLS	0.653***	-0.175***	-0.078	-0.607***	-0.345***	0.976***	-0.067***	0.024	-0.19	-0.264***
MGE	1.549	-0.065	-0.175***	-1.901***	-0.658**	-3.712	-0.254	-0.595***	-7.518	-1.341*
<b>CEE-5</b>										
OLS	0.006	-0.378***	-0.183***	-1.528***	-0.082	0.078	-0.348***	-0.212***	-1.023**	-0.021
FE_OLS	0.102	-0.288***	-0.085**	-1.154***	-0.476***	0.21	-0.272***	0.005	-1.095***	-0.412***
DOLS	-0.28	-0.272***	0.04	0.211	-0.057	0.207**	-0.263***	-0.135	0.467**	-0.296***
MGE	0.019	-0.216**	-0.105***	-0.729	-0.619	-5.367*	-0.401***	-0.776***	-12.111	-3.641**
<b>B-3</b>										
OLS	1.711***	-0.081	0.057	0.382	-0.457***	1.995***	-0.064	0.266**	-0.351	-0.570***
FE_OLS	2.148***	0.021	0.217***	0.581**	-0.192**	2.611***	0.005	0.479***	-0.385*	-0.522***
DOLS	2.183***	-0.179	0.002	-1.625***	-0.337	2.018***	0.121	0.160***	-1.375***	-0.011
MGE	4.174	0.313	-0.759	-5.100**	-1.178*	-3.755	0.285	-0.344	-7.268	-0.905
<b>SEE-3</b>										
OLS	1.311***	0.794***	-0.051	-0.039	0.008	1.350***	0.781***	-0.011	-0.059	0.066
FE_OLS	0.678***	0.009	-0.354	-0.953**	-1.024***	1.217***	0.073	-0.024	0.099	-0.463***
DOLS	0.678***	0.009	-0.354	-0.953**	-1.024***	1.217***	0.073	-0.024	0.099	-0.463***
MGE	1.539***	0.284	0.058	-0.654**	-0.204	0.911**	0.548	-0.546	-0.112	0.245

Source: Authors' calculations.

Note: \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% significance levels, respectively. OLS stands for ordinary least squares, FE\_OLS for fixed effect OLS, DOLS for dynamic OLS and MGE for mean group estimator. The CEE-11 cover Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia, the CEE-5 the Czech Republic, Hungary, Poland, Slovakia and Slovenia, the SEE-3 Bulgaria, Croatia and Romania.

Table A2

Estimation Results – Equation 6 and 7										
	capita	C <sup>G</sup>	j <sub>lending</sub>	p <sup>PPI</sup>	spread 2	capita	C <sup>G</sup>	j <sub>lending</sub>	p <sup>PPI</sup>	finlib
<b>Large OECD</b>										
OLS	2.550***	-0.384***	3.958***	3.939*	-0.134***	-0.072	-0.680***	4.096***	1.069	2.549***
FE_OLS	0.408***	-0.207***	0.026	-0.495**	-0.003	0.381***	-0.285***	0.015	0.022	0.111***
DOLS	0.362***	-0.056***	-0.029***	0.391***	-0.004	0.435***	0.012	0.122***	-0.660***	-0.304***
MGE	0.047	-0.093	-0.097	-2.716***	0.03	0.405	0.041	0.16	-0.583***	0.084
<b>Small OECD</b>										
OLS	0.347***	0.022**	0.038	-1.959***	-0.061***	0.305***	0.037	0.057	0.212	0.187***
FE_OLS	0.504***	-0.154***	0.004	-0.177	-0.022***	0.483***	-0.088***	-0.131***	0.192	0.223***
DOLS	0.645***	-0.021***	0.052**	0.690***	-0.037***	2.337***	-2.619*	2.274	2.076	4.722
MGE	0.592***	0.054	0.017	-1.772	-0.039**	1.077	-0.283	-0.463	-0.638	0.307***
<b>Emerging economies</b>										
OLS	0.347***	-0.197***	0.053*	-0.459***	0.002***	0.227***	-0.079***	0.005	-0.114**	0.232***
FE_OLS	0.488***	-0.113***	0.114***	-0.319***	0.001**	0.269***	0.069***	-0.035**	0.137***	0.302***
DOLS	0.386***	-0.071***	0.151***	-0.505***	-0.004	3.081***	-3.117***	2.640	-2.313***	5.679
MGE	0.901***	-0.470***	-0.063	-0.085*	0.052**	1.084	-1.846	-0.152**	-0.379	0.141**
<b>CEE-11</b>										
OLS	0.951***	0.201***	-0.029	-0.02	0.013***	1.166***	0.199***	-0.172***	0.12	-1.218***
FE_OLS	1.875***	0.043	0.614***	-0.011	-0.009***	2.362***	-0.013	0.323***	0.054	-1.529***
DOLS	1.321***	-0.123*	0.270***	-0.136	-0.029***	1.446***	-0.137***	0.046	-0.268	-1.446***
MGE	-7.493	4.527	-2.173*	-13.771***	0.474	10.417	-0.769*	-4.388***	-0.17	-1.874**
<b>CEE-5</b>										
OLS	0.02	-0.344***	-0.249***	-1.148***	0.007	0.175**	-0.225***	-0.269***	-1.836***	-1.296***
FE_OLS	0.232*	-0.335***	0.168***	-1.356***	-0.022***	0.663***	-0.298***	-0.008	-1.412***	-0.985***
DOLS	0.518***	-0.331***	0.124	1.081***	-0.029***	0.906***	-0.408***	-0.121	0.698	-1.304***
MGE	-1.045	-0.163**	-0.034	0.985	-0.180***	-19.708	-1.645**	-8.252***	2.034	-4.405
<b>B-3</b>										
OLS	1.865***	-0.309***	-0.06	0.403	0.044***	1.740***	-0.089*	0.349***	1.085***	1.088**
FE_OLS	2.738***	-0.002	0.589***	0.729***	-0.013	2.713***	-0.085*	0.485***	0.694**	-0.013
DOLS	2.344***	0.085	0.311***	-1.563***	-0.02	2.002***	0.123	0.135*	-1.924***	-0.041
MGE	27.900	15.375**	-6.492	-47.236***	-1.891	2.828	0.353	-0.735***	-2.427	-0.312***
<b>SEE-3</b>										
OLS	1.296***	0.732***	-0.05	-0.170***	0.010***	2.335***	0.683***	-0.153***	0.074	-1.211***
FE_OLS	1.636***	0.187**	0.472***	-0.736	-0.038***	1.792***	0.053*	0.101	-0.221	-3.087***
DOLS	1.636***	0.187**	0.472***	-0.736	-0.038***	1.792***	0.053*	0.101	-0.221	-3.087***
MGE	1.317	0.952	-1.530	-1.615***	0.146***	2.523**	-0.432	1.600**	-1.588**	-0.16

Source: Authors' calculations.

Note: \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% significance levels, respectively. OLS stands for ordinary least squares, FE\_OLS for fixed effect OLS, DOLS for dynamic OLS and MGE for mean group estimator. The CEE-11 cover Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia, the CEE-5 the Czech Republic, Hungary, Poland, Slovakia and Slovenia, the SEE-3 Bulgaria, Croatia and Romania.

Table A2 – cont.

**Estimation Results – Equation 8**

	capita	C <sup>G</sup>	lending	p <sup>PII</sup>	spread 2	reg
<b>Large OECD</b>						
OLS	2.257***	-0.557***	1.774***	8.736***	-1.078***	1.830***
FE_OLS	0.484***	-0.174***	-0.067***	-0.165	-0.036***	0.236***
DOLS	0.180***	-0.006	0.059***	-0.12	0.025	0.042
MGE	-0.237	0.144	-0.089	-1.365	0.088	-0.064
<b>Small OECD</b>						
OLS	0.413***	-0.104***	-0.053**	-1.043***	-0.030*	0.404***
FE_OLS	0.484***	-0.174***	-0.067***	-0.165	-0.036***	0.236***
DOLS	0.059***	0.006	0.024***	0.006	0.008	0.011
MGE	0.038	0.074	0.005	-0.209	0.024	-0.015
<b>Emerging economies</b>						
OLS	0.539***	-0.284***	0.284***	-0.318***	0.167***	-0.433***
FE_OLS	0.733***	-0.177***	0.000***	0	0	
DOLS						
MGE						
<b>CEE-11</b>						
OLS	1.113***	0.348***	-0.026	0.037	-0.063	-0.351***
FE_OLS	1.546***	0.066**	0.285***	-0.044	-0.603***	-0.068*
DOLS	0.686*	0.062	0.023	-0.492	-0.296***	-0.043*
MGE	1.222	0.261	0.051	-1.749***	0.221	-0.286***
<b>CEE-5</b>						
OLS	0.053	-0.345***	-0.224***	-1.234***	-0.027	-0.002
FE_OLS	0.220*	-0.257***	-0.011	-1.096***	-0.208*	-0.119**
DOLS	0.253**	-0.068	0.222***	0.104	-0.069	-0.146***
MGE	0.139	0.015	0.232**	-0.183	0.001**	-0.170***
<b>B-3</b>						
OLS	3.168***	0.146**	0.193	0.976***	-0.973***	-0.695***
FE_OLS	2.580***	0.012	0.412***	0.619**	-0.394***	0.157
DOLS	0.439	0.254**	0.152***	-1.739**	0.017	-0.005***
MGE	0.377	0.640*	0.5	-4.486	0.767	-0.565**
<b>SEE-3</b>						
OLS	1.298***	0.842***	0.048	-0.065	0.160*	0.325***
FE_OLS	1.919	0.182**	0.120***	0.334	-0.828***	-0.269***
DOLS	1.919	0.182**	0.120***	0.334	-0.828***	-0.269***
MGE	4.965***	0.470***	1.015***	-0.907***	0.112	-0.577***

Source: Authors' calculations.

Note: \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% significance levels, respectively. OLS stands for ordinary least squares, FE\_OLS for fixed effect OLS, DOLS for dynamic OLS and MGE for mean group estimator. The CEE-11 cover Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia, the CEE-5 the Czech Republic, Hungary, Poland, Slovakia and Slovenia, the SEE-3 Bulgaria, Croatia and Romania.

# Monetary Transmission in the New EU Member States: Evidence from Time-Varying Coefficient Vector Autoregression

Zsolt Darvas<sup>1</sup>

*This paper studies the transmission of monetary policy in selected new EU Member States with structural time-varying coefficient vector autoregressions in comparison with that in the euro area. In line with the Lucas Critique, reduced-form models, like standard vector autoregressions (VARs), are not invariant to changes in policy regimes. Many of the new members of the EU have experienced changes in monetary policy regimes, which calls for the use of a time-varying parameter analysis. Our results indicate that some parameters change significantly, altering the shape of the impulse response functions. Monetary policy is most powerful in Poland and comparable in strength to that in the euro area and is least powerful in Hungary, while the strength of monetary policy in the Czech Republic lies in between. We explain these results by the credibility of monetary policy and openness.*

## 1 Introduction

An important aspect of monetary integration is the similarity of the transmission mechanism of monetary policy across member states of a currency area. Ideally, monetary policy should have the same effect on all member states, causing them to equally share the burden of adjustment after a monetary contraction or the advantages of a monetary easing. Therefore, the analysis of similarities in the transmission mechanism in a common currency area is a pivotal concern. The Monetary Transmission Network of the European System of Central Banks (ESCB) analyzed in detail the transmission mechanism in the current euro area member countries (Angeloni et al., 2003). A large amount of research has also been conducted for the new Member States (NMS) of the EU; see Coricelli, Égert and MacDonald (2006) for an extensive survey.

Studying the NMS with standard techniques raises an elementary problem that is related to changes in monetary regimes. Both common sense and the Lucas Critique suggest that changes in monetary regimes are likely to affect the transmission of monetary policy. A number of NMS, namely the Czech Republic, Hungary and Poland, have made their exchange rate regimes more flexible and have changed the way monetary policy has been conducted during the last decade. Regime changes call into question the usefulness of studying the available sample period of these countries with fixed parameter models. Only a few years have passed since the last change in regime, and the period since the last change does not provide a sufficient number of observations for estimation. Moreover, even since the last major regime change, some less pronounced, although important changes may have taken place, like the band shift of the Hungarian forint in 2003. These minor or subregime changes

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further complicate the selection of sample periods for which one can safely assume a stable monetary policy regime and hence constant parameters.

Despite the above-mentioned obvious drawback, to our knowledge our paper is the first one that adopts time-varying coefficient (TVC) techniques to study the transmission mechanism of the NMS.<sup>2</sup> Still, possible time variation in the transmission mechanism or time variation in the variance of shocks hitting the economy is certainly not only an NMS issue. There is a heavy debate about the monetary policy of the U.S.A.; see, for instance, Canova and Gambetti (2006), Cogley and Sargent (2005), Sims and Zha (2004) and references therein. Canova and Gambetti (2006) e.g. question whether U.S. monetary policy is the result of “bad luck or bad policy,” that is, whether the bad inflation outcome of the early 1980s and the good inflation outcome since the late 1980s are due to “luck” (the decline in the variance of the shocks) or to “policy” (changes in the way monetary policy is conducted). Canova and Gambetti (2006) found more evidence in favor of the bad luck hypothesis, while Cogley and Sargent (2005) support the bad policy view. For the euro area, Ciccarelli and Rebucci (2004) used a TVC technique to study changes in the monetary transmission mechanism.

In this paper we study the transmission mechanism in three NMS, namely the Czech Republic, Hungary and Poland, using TVC vector autoregressions (TVC-VAR). The VAR methodology is perhaps the most common econometric tool for the study of the transmission mechanism (see Christiano, Eichenbaum and Evans, 1999). However, since VARs are reduced-form models, their parameters are not invariant to policy changes, so that time-varying analysis is required when policies change in the sample period. More generally, since a standard VAR is a linear model (like most of the models used in empirical research), its parameters can change even if the underlying structural model has constant parameters, provided that the underlying structural model is nonlinear.

We also study the transmission mechanism of the euro area (using aggregates since 1991) to compare the transmission mechanism in the three NMS with that of the euro area as a whole. Our first results indicate that monetary transmission changed in the three countries, as it did in the euro area. We find that monetary policy is most powerful in Poland and comparable in strength to that of the euro area and is least powerful in Hungary. We explain these differences with the accumulated credibility of monetary policy in the three countries and with openness.

The rest of the paper is organized as follows. Section 2 briefly describes monetary regimes in the NMS. Section 3 surveys the TVC-VARs used in the literature and describes the model we use. Section 4 details the data and discusses important issues relating to seasonality and trends. The results of our TVC-VAR analysis are presented in section 5. Section 6 concludes, section 7 contains references and section 8 presents charts.

<sup>2</sup> The survey presented in Coricelli, Égert and MacDonald (2006) identifies this paper as the only one adopting time-varying coefficient methods for the study of the monetary transmission mechanism in the NMS, in addition to a related paper of Darvas (2001), which studied the exchange rate pass-through using a TVC error-correction model.

## 2 Monetary Regimes in the NMS

Charts 1, 2 and 3 show nominal exchange rate developments in the Czech Republic, Hungary and Poland, respectively. The Czech Republic had a narrow exchange rate band regime until 1996,<sup>3</sup> when the band was widened to  $\pm 7.5\%$ . Not much later, in May 1997, the band was swept away by a speculative attack, and the koruna was floated with occasional central bank interventions.

In Hungary, a preannounced crawling band regime was introduced in 1995 after a long period with an adjustable peg. The adopted band was narrow at  $\pm 2.25\%$ . However, as chart 2 shows, the market rate eventually evolved like in a crawling peg, since it was almost continuously at the strong edge of the band (with the exception of the period of the Russian and Brazilian crises in late 1998 and early 1999). The band was widened substantially in May 2001 to  $\pm 15\%$ , and the rate of crawl was reduced to zero in October 2001. In June 2003, the band was devalued by 2%.

The Polish authorities made their exchange rate regime flexible gradually. As chart 3 indicates, Poland also adopted a preannounced crawling band for most of the 1990s, but the band was widened to  $\pm 15\%$  in several steps. There were heavy central bank interventions until 1997, which is also reflected in the relatively stable rate within the band, but since early 1998, the rate was allowed to move freely within the wide band. In April 2000, the band was abolished and the zloty was allowed to float freely. For more information on the exchange rate systems of these countries, see Darvas and Szapáry (2000).

Hence, all three countries moved from an exchange rate targeting regime to an inflation targeting system (which is still combined with a wide exchange rate band in Hungary). These changes in monetary regimes definitely had an impact on the monetary transmission mechanism. Estimation for a sample consisting of both the exchange rate targeting and the inflation targeting regimes does not make sense with a fixed parameter model. The longest homogeneous sample is available for the Czech Republic starting in late 1997. In the cases of Poland and Hungary, the latest major regime change occurred in 2000 and 2001, respectively, but the band shift of the Hungarian forint in 2003 marked a minor or subregime change.<sup>4</sup> Therefore, the sample periods since the last regime changes are too short for reliable fixed parameter analyses, even if it is assumed that the linear approximation was correct.

## 3 Time-Varying Coefficient VARs

Three important issues for our model are described in this section – the most recent TVC-VAR methods, the sign restriction identification method and impulse response analysis.

<sup>3</sup> Chart 1 shows data starting in 1995; up to 1995 the width of the band was similarly narrow.

<sup>4</sup> The tiny 2% devaluation compared to the  $\pm 15\%$  width of the band indicated that monetary authorities had changed their preferences. Up to 2003, the exchange rate had been allowed to reach the strong edge of the band fueled by high interest rates and revaluation expectations. The devaluation signaled that the authorities did not want to allow a strong nominal exchange rate anymore.

### 3.1 Specification

Three main types of TVC-VAR models have been proposed recent years:

1. Parameters treated as latent variables that follow random walks; the Kalman filter is used for estimation. This technique was used e.g. in Canova and Gambetti (2006), Ciccarelli and Rebucci (2004), and Cogley and Sargent (2005).
2. Parameters that switch between regimes (back and forth) driven by a latent state variable which follows a Markov switching process. This technique was used in Sims and Zha (2004).
3. Parameters that change from one regime to another smoothly (and permanently) in time; the specification is the multivariate extension of the STAR (smooth transition threshold autoregression) model. This technique was developed in He, Teräsvirta and González (2005).

In this paper we follow the three papers indicated in the first group by assuming that reduced-form VAR parameters follow random walks and use the Kalman filter for estimation and inference. The reason for our choice is the following: The random walk specification is a flexible model which can capture various time paths of the parameters. In contrast, the STAR-type time specification assumes a particular path and a smooth transition between the beginning and the end regime, which could be too restrictive. The Markov switching specification, on the other hand, assumes that there are several regimes and that the parameters switch back and forth between these regimes. However, regime changes in the countries under study can be regarded as permanent, at least until the end of the sample period. The countries under study are expected to enter ERM II and later the euro area, hence, the probability of returning to the initial monetary regimes of the early 1990s is almost zero. For these reasons we selected the random walk specification from among the three options indicated above.

### 3.2 Identification

The second important issue is identification. Traditional identification, which usually takes the form of some contemporaneous and/or long-run restrictions, has been severely criticized, e.g. in Faust and Leeper (1997), Cooley and Dwyer (1998), and Faust et al. (2004). A possible solution to this problem could be the recent sign restriction identification method popularized by e.g. Uhlig (1999), Canova and De Nicoló (2002), and Peersman (2005). Canova and Gambetti (2006) adopt this technique in a TVC-VAR framework. In the current version of the paper we use standard contemporaneous restrictions, but we will augment the paper with the results of the sign restriction methodology later.

### 3.3 Impulse Response Analysis

The third important issue is impulse response analysis. Since the model is non-linear due to changing parameters, no unique impulse response function is available, but we can attach an impulse response function to each observation of the sample. Still, there are two possible ways to proceed. One could use the parameter set of time  $t$  to calculate the impulse response function for  $t, t+1,$

$t+2$ , ... or use the parameter set of time  $t$ ,  $t+1$ ,  $t+2$ , ... that is, take into account future parameter changes.

The first option answers the question “*What did the monetary authorities think that the transmission would be?*”<sup>5</sup> while the second one answers “*How is the shock transmitted to the economy?*” Obviously, at the last observation of the sample only the first option can be used, at the last but one observation the second option can be used only for one observation, and so on. We used the first option in the whole sample period. In practice, we calculated the impulse responses as the difference between two simulations, of which in the first one there is a shock that hits the economy at time  $t$ . Furthermore, we normalized the impulse response functions to show the effects of a 100 basis point monetary policy shock.

#### 4 Data

Our data set includes quarterly data in the period from 1993 to 2004. VARs used for monetary transmission usually include four endogenous variables: measures for output, price, the interest rate, and the real exchange rate. Our raw data are plotted on charts 4 and 5. Chart 4, which shows log levels of GDP and consumer prices, indicates the two important features of our time series: seasonality and trends.

Seasonality is a salient feature of GDP levels, but consumer prices also exhibit seasonality.<sup>6</sup> The standard approach used in empirical VARs is to eliminate seasonality by using a seasonal adjustment method. However, it has been argued in the literature that standard seasonal adjustment procedures introduce artificial features into the data. To increase the robustness of our results, we used and compared two seasonal adjustment techniques: the standard X12 method and the so-called basic structural model (BSM) of Harvey (1989), which is described in the following section.

The second main feature of the data is the presence of trends. However, standard differencing, which is usually done before estimating VARs, is not suitable in the case of the NMS. Chart 4b shows log CPI levels, and there is clear ocular evidence of a marked slowdown in inflation in the slope of the CPI level. This is also reflected in chart 5a, which shows nominal interest rate developments: there is a downward moving trend in the nominal interest rate that is consistent with falling inflation. Therefore, simple differencing is not suitable for detrending. Finally, chart 5b shows the log levels of real effective exchange rates, which show upward moving trends. Scores of papers study the real exchange rate behavior of the NMS, giving good reasons to expect an equilibrium real exchange rate appreciation; see, for instance, Égert, Halpern and MacDonald (2004). Consequently, an upward movement in the real exchange rate in a given quarter does not necessarily imply a contraction, only if it exceeds the rate of equilibrium real appreciation.

Apart from differencing, which could be inadequate, as we have argued above, we can handle the issue of trends by using other detrending methods or

<sup>5</sup> Since parameters are assumed to follow driftless random walks, their forecasts are equal to their current values.

<sup>6</sup> Moreover, the relative price level used to calculate the real exchange rate also exhibits seasonality if the seasonality in prices of the countries does not cancel out perfectly. In the empirical section we found that the relative price levels do have seasonal components.

by estimating the VAR for levels (which is also a standard practice). We adopted the pragmatic approach to estimating the models for levels, first differences, and for detrended series using four additional methods: the linear trend, the quadratic trend, the Hodrick-Prescott filter, and a high-pass filter (not band-pass<sup>7</sup>).

#### 4.1 Seasonal Adjustment

We used and compared the results of the X12 method and the BSM model for seasonal adjustment.<sup>8</sup> The BSM model is an unobserved components model which allows a smooth I(2) trend and changing seasonal components. The I(2)-ness is an important feature for the time series to be modeled, since, for instance, there were marked but gradual changes in the inflation process of these countries, and the I(1) assumption for the price level is inadequate, as we have argued before. The possibility of changing seasonal patterns is also important, which is supported by the analysis.

In this section we also suggest a new initialization of the BSM model.

The BSM model consists of the following equations:

$$y_t = \mu_t + \gamma_t + \varepsilon_t \quad (1)$$

$$\mu_t = \mu_{t-1} + \beta_{t-1} + \eta_t \quad (2)$$

$$\beta_t = \beta_{t-1} + \zeta_t \quad (3)$$

$$\sum_{i=0}^3 \gamma_{t-i} = \omega_t \quad (4)$$

where equation (1) is the measurement equation relating the observed series  $y_t$  to its unobserved seasonally adjusted component  $\mu_t$  and its unobserved seasonal component  $\gamma_t$ ; state equation (2) defines the I(2) process of  $\mu_t$  with an unobserved time-varying drift  $\beta_{t-1}$ , which follows a random walk according to state equation (3), while equation (4) defines the seasonal components. The error terms  $\varepsilon_t$ ,  $\eta_t$ ,  $\zeta_t$ , and  $\omega_t$  are assumed to be mutually uncorrelated and normally distributed with variances  $\sigma_{(\varepsilon)}$ ,  $\sigma_{(\eta)}$ ,  $\sigma_{(\zeta)}$  and  $\sigma_{(\omega)}$  respectively. Given the initial conditions, the Kalman filter can be used to evaluate the likelihood function of the process; this function can then be used to calculate maximum likelihood estimates of the four variances.

Initial conditions should be set for the mean and the variance-covariance matrix of the unobserved vector consisting of the level of the seasonally

<sup>7</sup> In business cycle research, a band-pass filter is frequently adopted to recover the component of the series corresponding to cycles between 1.5 and 8 years, that is, the component without “short-run” noise and without long-run trends. However, monetary policy does have an effect in the first 1.5 years; therefore, we eliminated only long-run trends via a high-pass filter in the manner of Christiano and Fitzgerald (2003), which is the latest among the three mostly commonly adopted band-pass filter approximations in the literature.

<sup>8</sup> We also carried out a small simulation exercise to compare the two methods. That is, we assumed an either constant or changing seasonal pattern, added a trend and some noise, simulated this artificial data-generating process, and used the two seasonal adjustment techniques on the simulated data. The BSM method was slightly better than the X12 method, in the sense that the squared deviation of the estimated seasonal factor from the true one was smaller than that of the X12’s seasonal factor. However, both methods created artificial autocorrelation in the data which was not present in the data generating process.

adjusted series ( $\mu_0$ ), its growth rate ( $\beta_0$ ), and three seasonal factors ( $\gamma_0, \gamma_{-1}, \gamma_{-2}$ ). The initial conditions for seasonal factors are usually set equal to zero. However, when we adopted this assumption, a simple graph of the estimated seasonal factors indicated that the seasonal patterns were usually smaller in the first years than in later years. This phenomenon could partly reflect the change in seasonality over time, but could also simply reflect the zero initial conditions of the seasonal factors. Therefore, we adopted an iterative procedure of setting initial conditions and estimation. Specifically, to get a first estimate of the unobserved components, we adopted the following initial conditions:

$$\mathbf{a}_0^{(1)} = \begin{bmatrix} y_1 - (y_5 - y_1)/4 \\ (y_5 - y_1)/4 \\ 0 \\ 0 \\ 0 \end{bmatrix}, \mathbf{P}_0^{(1)} = \text{diag} \begin{pmatrix} \sigma_0^2 \\ \sigma_0^2 \\ \sigma_0^2 \\ \sigma_0^2 \\ \sigma_0^2 \end{pmatrix} \quad (5)$$

where e.g.  $y_1$  indicates the first observation in the sample (e.g. of the logarithm of output). The initial condition for the growth rate is set equal to one fourth of the four-quarter growth in the first year of the series and is subtracted from the first observation to get an initial condition for the seasonally adjusted level of the series, and  $\sigma_0 = 0.01$ . Estimation of the BSM model in equations (1) to (4) using the initial conditions in (5) allows for the calculation of both filtered and smoothed estimates for the unobserved components. We used the smoothed estimates to define a new vector for the initial conditions:

$$\mathbf{a}_0^{(2)} = \begin{bmatrix} \hat{\mu}_{1,T}^{(1)} - (\hat{\mu}_{5,T}^{(1)} - \hat{\mu}_{1,T}^{(1)})/4 \\ (\hat{\mu}_{5,T}^{(1)} - \hat{\mu}_{1,T}^{(1)})/4 \\ \hat{\gamma}_{4,T}^{(1)} \\ \hat{\gamma}_{3,T}^{(1)} \\ \hat{\gamma}_{2,T}^{(1)} \end{bmatrix}, \mathbf{P}_0^{(2)} = \hat{\mathbf{P}}_{1,T}^{(1)} \quad (6)$$

where e.g.  $\hat{\mu}_{1,T}^{(1)}$  indicates the first observation of the smoothed estimate of the seasonally adjusted level of the series and  $\hat{\mathbf{P}}_{1,T}^{(1)}$  indicates the smoothed estimate of the variance-covariance matrix of the unobserved components in the first observation; superscript (1) indicates that initialization is based on the first set of initial conditions. Estimation of the BSM model using the second set of initial conditions allows for the calculation of new estimates for the unobserved components and their covariance matrices, which can be used to define a third set of initial conditions, and so on. We continued this iterative procedure until the state estimates converged, which was defined as

$$d^{(i,i-1)} \equiv \sum_{t=1}^T \left| \hat{\mu}_{t,T}^{(i)} - \hat{\mu}_{t,T}^{(i-1)} \right| < \nu \quad (7)$$

where we have set  $\nu = 10^{-5}$ .

## 5 Results

### 5.1 Seasonal Adjustment

GDP and the price level of various countries are usually highly seasonal. Consequently, the real exchange rate is also seasonal unless the seasonality of prices at home and abroad cancel each other out exactly, which is unlikely. This effect is neglected in most of the studies using monthly or quarterly data on real exchange rates. Nominal exchange rates (and also nominal interest rates), though, are not seasonal. Therefore, we adjusted GDP, the domestic price level and the relative price level, and calculated the seasonally adjusted real exchange rate by using the seasonally adjusted relative price level and the raw nominal exchange rate series.<sup>9</sup>

The number of iterations required by the criterion in (7) averaged 24 in the range of [13–41] for all three series of three countries (the Czech Republic, Hungary and Poland). However, the Slovene data required many more iterations: 111 for the price level, 118 for the relative price level and 169 for GDP.

There were, in some cases, important differences between the first-state estimates (based on the initial conditions indicated in (5)) and the result of our iterative procedure. For GDP, the difference was around 1% in most cases in the first year of the sample, but in the case of Poland, it even reached 3.3%. By contrast, the difference for prices was generally tiny.

### 5.2 VAR Estimates

In the current version of the paper we estimated first-order VARs, i.e. VARs using only one lag of all series. Since we have four TVCs per equation and 4 series, in a VAR(1) without a constant, 16 TVCs need to be estimated. This implies 16 parameters; they are the standard errors of the innovations driving the parameters in the state equations. There are 4 additional parameters in the measurement equations as well; they are the standard errors of the innovations of the measurement equations. Hence, in a VAR(1) without a constant, 20 parameters need to be estimated. This is difficult to compute, although all of our estimations converged to a unique maximum. However, a VAR(1) is not satisfactory: innovations in some (not all) equations are autocorrelated. There are two possible solutions: (1) we can increase the order without any constraint, which explodes the number of parameters to be estimated, or (2) we can adopt some restrictions. For example, Stock and Watson (2005), who estimate fixed parameter VARs for the G-7, allow more lags only for the left-hand side variable and restrict the number of lags of all other variables to one.

<sup>9</sup> Nominal exchange rates do not include seasonal patterns, but are very volatile, which could complicate seasonal adjustment. Our calculations also reflected this. For comparison, we also seasonally adjusted the real exchange rate itself (using the BSM method with our iterative procedure), which required iterations between 51 and 123 for 4 of our countries, while the seasonal adjustment of relative prices converged faster, with the number of iterations in the range of [17–35].

We are currently experimenting with such extensions; hence, the results presented in this version of the paper are preliminary.

Our first goal was to compare different treatments of the data. To this end, we estimated six possible specifications for all countries: levels,<sup>10</sup> differences, deviation from the linear trend, deviation from the quadratic trend, deviation from the Hodrick-Prescott trend, and high-pass filtered series. The 95% confidence bands of time-varying parameters indicate that some, but not all parameters change significantly.

In VARs it is difficult to interpret the parameters. Therefore, chart 6 compares the effect of a 100 basis point monetary shock on the level of output using the six possible treatments of the trends.<sup>11</sup> Chart 6 indicates that responses are similar for the level, the Hodrick-Prescott (HP) filtered and the high-pass filtered series, reaching the largest effect of about 0.5% to 0.7% of GDP three or four quarters after the shock, although in the case of the high-pass filtered series the effect is more persistent than in the other two cases. By construction, the shock does not have a permanent effect using these treatments of the data.<sup>12</sup> For the differenced specification, the shock does not have a long-run effect on the growth rate, but the accumulated effect on the growth rate could be different from zero, implying a permanent effect on the level of the series. As chart 6 indicates, the response of output up to four to six quarters is similar for differenced data for these three methods, but there is no reversal toward zero afterwards. Finally, using data as a deviation from both the linear and quadratic trends yields a highly cyclical response which is implausible. Since responses based on estimates for the level, HP-filtered and high-pass filtered series were reasonably similar, we show results for HP-filtered series only in chart 7.

Chart 7 shows responses of the euro area at different dates – 1994, 1998, and 2005. The point estimates indicate a decline in output responses.

Plotting time-varying coefficients for the Czech Republic, Hungary and Poland indicates, again, that some, but not all parameters have changed: Changes in the parameters of the exchange rate and the interest rate equations are significant in most cases, indicating time-varying structures in accordance with our expectations. It is also remarkable that we can observe “substantial” parameter changes at the time of monetary regime changes: around 1996 to 1997 in the case of the Czech Republic, in 1995 and in 2001 in Hungary, and around 1998 to 2000 in Poland.

Chart 8 compares output responses<sup>13</sup> in each of the three NMS with that of the euro area, normalized, again, to a 1 percentage point monetary shock. In the three NMS, monetary policy is least effective in Hungary and most effective in Poland, while its effect in the Czech Republic is in between. The strength of the Polish response is comparable to that of the euro area. We sug-

<sup>10</sup> We allowed a time-varying intercept for the specification using levels, which adds four additional parameters to be estimated.

<sup>11</sup> We show responses to output only. For prices we have the so called price-puzzle result, that is, prices increase after a monetary contraction. We are currently working on extending the VAR with exogenous variables, such as commodity prices, a method that is frequently found to be useful in removing the price puzzle.

<sup>12</sup> This is also true, of course, for linearly and quadratically detrended data.

<sup>13</sup> We have also received the “price-puzzle” result for Hungary and the Czech Republic in most of the sample, although in the case of Hungary, it had disappeared by the end of the sample.

gest two possible explanations for these results: the credibility of monetary policy on the one hand, and openness on the other. Hungarian monetary policy was rather accommodative during the crawling peg period from 1995 to 2001. The approach of the central bank was to tightly manage the exchange rate in order to gradually decrease inflation without risking large trade imbalances. Moreover, the tiny devaluation of the wide band in 2003 also indicated that the preferences of the monetary authorities did change, and can change. These factors could have contributed to the low credibility of central bank policy; hence, market participants might not react forcefully to monetary actions. Poland, on the other hand, adopted a very tight monetary policy even in an economic downturn. This could have contributed to the high credibility of monetary actions: market participants learned that policy was strict and concentrated only on inflation in the past, hence, they might react forcefully to monetary policy actions, because if they did not, they could expect further consistent steps from the Polish central bank. Openness could also explain the differences: Hungary is rather open, while Poland is fairly closed.

## 6 Conclusions

The similarity of the transmission mechanism of monetary policy across the member states of a monetary union is an important aspect of monetary integration. This paper studies the transmission of monetary policy in three new Member States of the EU with structural time-varying coefficient VARs in comparison with that in the euro area. In line with the Lucas Critique, reduced-form models, like standard VARs, are not invariant to changes in policy regimes. Many of the new Member States have experienced changes in monetary policy regimes, which calls for the use of a time-varying parameter analysis. Our preliminary results indicate that some parameters change significantly, altering the shape of the impulse response functions. Among the three countries studied, monetary policy is most powerful in Poland and comparable in strength to that in the euro area and is least powerful in Hungary, while the strength of monetary policy in the Czech Republic lies in between. We explained these differences by the credibility of monetary policy and openness.

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## 8 Charts

Chart 1

### Nominal Exchange Rate of the Czech Koruna

January 1, 1995, to March 31, 2006

logarithm of koruna per basket (inverted scale)



Source: Updated from Darvas and Szapáry (2000).

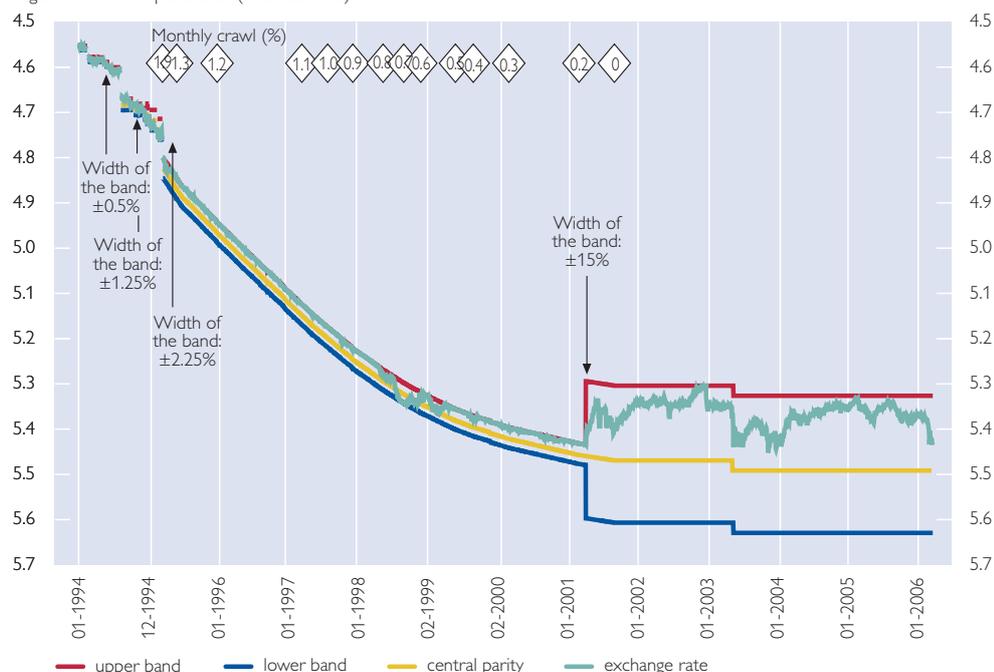
Notes: Basket used prior to May 1997: 65% Deutsche mark – 35% U.S. dollar. For better comparison, we use both the composition of the basket and the euro for the floating period.

Chart 2

### Nominal Exchange Rate of the Hungarian Forint

January 1, 1994, to March 31, 2006

logarithm of forint per basket (inverted scale)



Source: Updated from Darvas and Szapáry (2000).

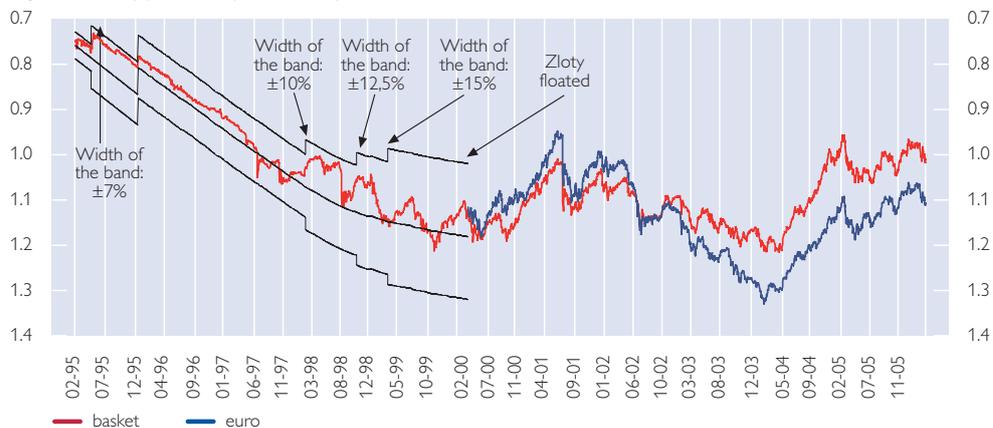
Notes: Composition of the basket: 50% Deutsche mark – 50% U.S. dollar from August 1993 to May 1994, 70% ECU – 30% U.S. dollar from May 1994 to December 1996, 70% Deutsche mark – 30% U.S. dollar from January 1997 to December 1998, 70% euro – 30% U.S. dollar from January to December 1999, 100% euro since 2000.

Chart 3

### Nominal Exchange Rate of the Polish Zloty

February 1, 1995, to March 31, 2006

logarithm of zloty per basket (inverted scale)



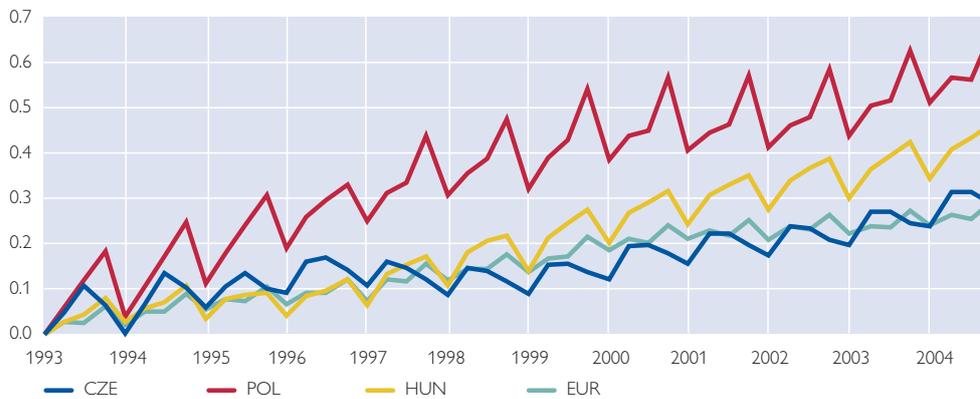
Source: Updated from Darvas and Szapáry (2000).

Notes: Composition of the basket prior to 1999: 45% U.S. dollar, 35% Deutsche mark, 10% pound sterling, 5% French franc, 5% Swiss franc; since 1999: 55% euro, 45% U.S. dollar. The zloty was floated in April 2000. For better comparison we use both the composition of the last basket and the euro for the floating period.

Chart 4a

### Log Levels of Unadjusted Output

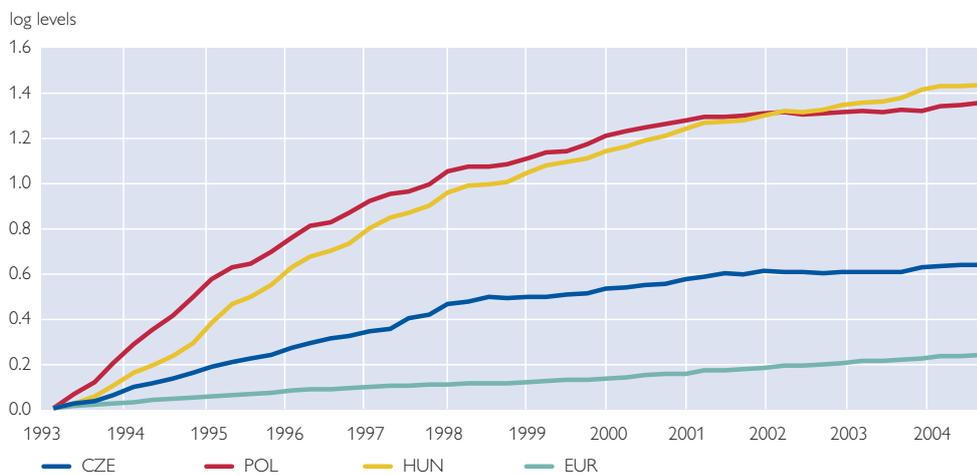
Index (December 2000 = 100)



Quelle: Author.

Chart 4b

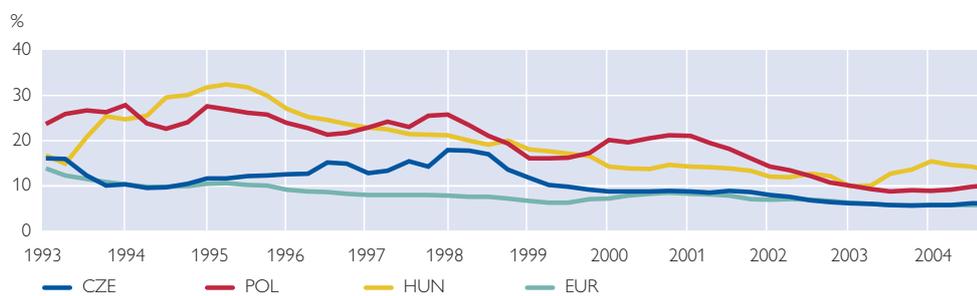
**Log Levels of Consumer Prices**



Quelle: Author.

Chart 5a

**Short-Term Nominal Interest Rates**



Quelle: Author.

Chart 5b

**Log Levels of Unadjusted Real Exchange Rates**

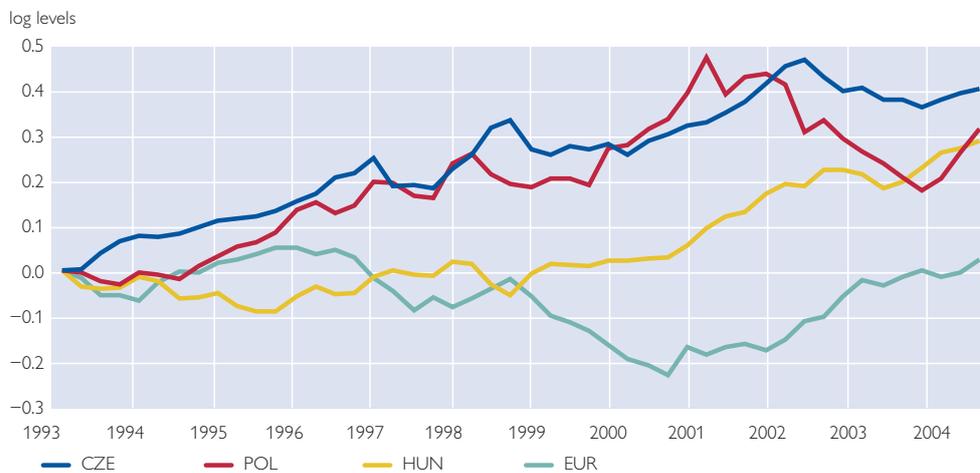


Chart 6

**Comparison of Euro Area GDP Responses, Different Treatments of the Trend Q4 98**

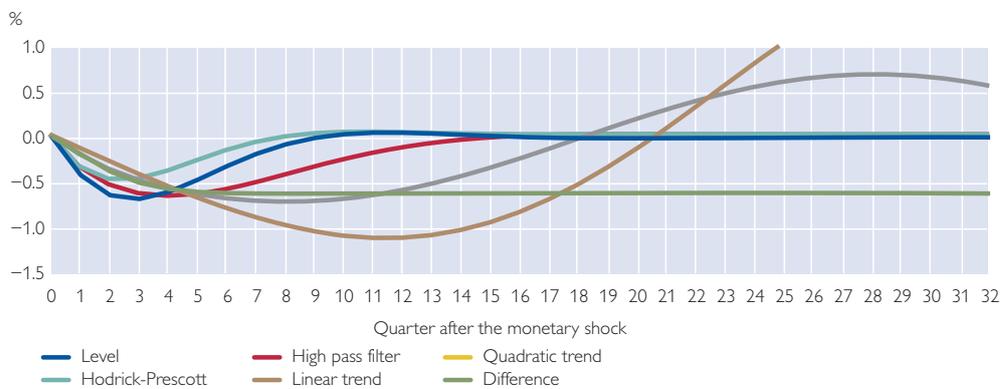
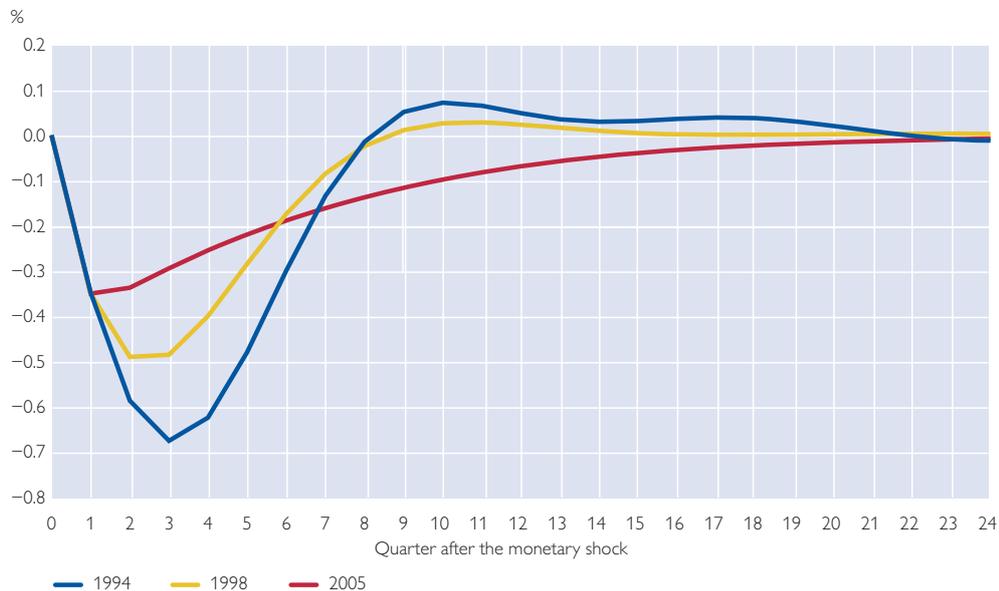


Chart 7

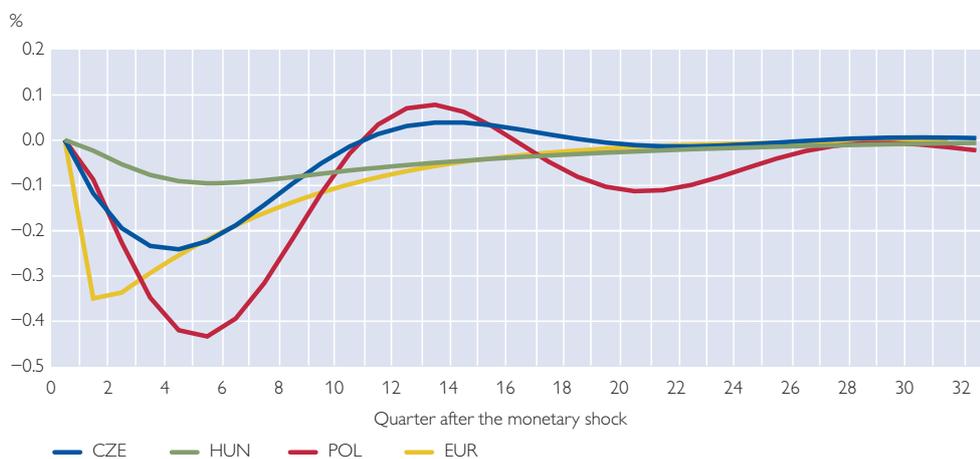
**Comparison of Euro Area GDP Responses Using HIP-Filtered Data**



Quelle: Author.

Chart 8

**Output Response to a 1 Percentage Point Monetary Shock of End-2004**



Quelle: Author.



# STUDIES

# Ukraine: Macroeconomic Developments and Structural Change with a Special Focus on the Energy Sector

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Major traits of Ukraine's macroeconomic and structural development since the turn of the millennium constitute the focus of this study. Following a brief look back at the decade-long recession of the 1990s, the authors identify positive terms-of-trade shocks, the cumulative effect of structural reforms and the strong recovery of domestic demand as the underpinnings of the country's robust economic recovery of 2000–2004, while a halt, respectively reversal, of terms-of-trade gains and a deterioration of the investment climate are regarded as the driving forces of the sharp slowdown of 2005 and early 2006. Fiscal policy and tax reforms, monetary and exchange rate policies, and the evolution of external accounts are analyzed in more detail. Given Ukraine's extremely energy-intensive economic and export structure and concomitant vulnerability, energy and gas sector developments are given prominence on the structural front. A near-term economic outlook wraps up the study.

## 1 Introduction

This study gives an overview over the eventful evolution of the Ukrainian economy since the turn of the millennium with a focus on macroeconomic developments and on structural change. To better clarify the point of departure, i.e. the country's economic situation at the turn of the millennium, section 2 briefly sketches the economic developments of the 1990s and also contains some references to the overall political and external environment. Since 2000, Ukraine has (so far) experienced two major economic episodes: The turnaround at the beginning of the decade, followed by years of strong recovery (2000–2004), and the sharp slowdown of 2005. Section 3 concentrates on these two consecutive periods and discusses the driving forces behind the respective adjustments. It deals with macroeconomic developments and policies, in particular GDP developments, fiscal policy and tax reforms, monetary policy, inflation and exchange rate developments, the balance of payments and external debt. Moreover, it further analyzes structural changes and policies in a key sector that weighs heavily with the Ukrainian economy's competitiveness, namely energy. Section 4 gives a short and medium-term economic outlook for the country. The study is deliberately selective. In particular, it hardly deals with the labor market and unemployment, farming, demographic developments and the social situation.

## 2 Economic and Political Framework and a Look Back at Developments of the 1990s<sup>2</sup>

Measured by territory (603,700 square kilometers), Ukraine is the second-largest country in Europe, following Russia; measured by population (2005:

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<sup>2</sup> For more information on developments in Ukraine in the 1990s, see Barisitz (1999 and 2000).

46.9 million), it ranks sixth after Russia, Germany, France, Britain and Italy. However, owing to strong emigration and low birth rates, Ukraine's population has shrunk by about 9% since the country gained independence in 1991. The Ukrainian GDP per capita amounted to EUR 6,210 in purchasing power parity (PPP) terms in 2005, which corresponds to only about one-quarter of the euro area or Western European level. Equipped with important iron ore and coal deposits in or near the Donetsk basin (Donbass) in the east of the country, Ukraine has been a major exporter of steel and heavy industrial equipment since Soviet times. Origins of this activity can even be traced back to the Russian Empire.

Ukraine's heavy industry is very energy-intensive and consumes large amounts of natural gas and oil, which the country itself does not possess in sufficient quantities and which are therefore supplied in pipelines from neighboring Russia and Central Asia. Most of this energy is supplied at prices that are far below world market levels, and Ukraine's energy consumption per unit of output remains one of the highest in the world. The country processes the major part of the imported oil in refineries and resells petroleum products at world market prices. Furthermore, Ukraine is an important transit country for energy deliveries: Oil and gas pipelines built by the Soviets in the 1970s and 1980s run from Russia across the country to Central and Western Europe, assuring the bulk of Russian oil and gas exports outside the CIS.

The industrialized Eastern part of the country has a larger Russian population and features higher levels of income; it contrasts with the more farming-dominated and poorer Western part of Ukraine. Before 1917, Ukraine was called the "granary of Europe" for the rich harvests its extremely fertile "chernozyom" (black soil) belt provided. In 2004, by contrast, Ukraine's most important export items were metals (40%), machinery (17%), fuel and energy products (12%) and food. The country mainly imports fuel and energy products (36%), machinery (28%) and chemicals (14%). Most of Ukraine's exports, particularly metals, petroleum products and food, constitute staples with a rather low value-added which are subject to the volatility and cyclicity of world market price fluctuations.

Since the collapse of the Soviet Union, the political framework in Ukraine has been marred by discord and power struggles between the executive branch, i.e. president and government, on the one hand and the legislative branch, i.e. parliament (Verkhovna rada, the Supreme Soviet) on the other. It has repeatedly been extremely difficult to find a consensus among the major political forces on economic policy and the direction of reforms. This situation has made the country's transition to a market economy slow and hesitant and has contributed to numerous setbacks in the implementation of structural changes and modernization. Altogether, the first decade of Ukraine's independence was characterized by uninterrupted economic contraction. According to the European Bank for Reconstruction and Development (EBRD), by 1999 Ukraine's GDP had descended to less than 40% of what it had been ten years earlier (EBRD, 2000, p. 65).

Recurrent budget and current account disequilibria (twin deficits) produced a trend of rising public and external debt, pushing Ukraine to the brink of insolvency at the end of the decade. Generally weak payment discipline,

inadequate protection of property rights, insufficient rule of law and widespread corruption promoted capital flight and held foreign strategic investors at bay. Monetization was modest and barter and other types of nonmonetary transactions dominated in many areas, particularly in the energy sector. Accordingly, the shadow economy was large; in the second half of the 1990s it was estimated by the Ministry of Economy to have peaked at more than half the size of the formal economy (IMF, 2005, p. 19).

The 1990s can be seen to comprise three phases of Ukrainian economic development and policies: First, the initial era of unambitious reform (1992–1994), when the newly established Ukrainian leadership presided over the effects of the disintegration of the former USSR without pursuing any major reform efforts. This stage featured hyperinflation (*inter alia*), which reached 10,155% in 1993. In the fall of 1994, a new administration adopted a macro-stabilization and structural reform program which, however, soon lost momentum and ushered in the second phase, one of stop-and-go policies. Enterprise privatization was largely effected through management and employee buy-outs and voucher schemes, which hardly brought any new capital and know-how and which strengthened insider control. Restructuring and consolidation was sluggish. This phase was interrupted by the repercussions of the Russian crisis of 1998, which struck a fragile Ukraine and triggered the third phase, a period of extended crisis management. The country showed some similarities (weak tax system, dominance of treasure bills in budget deficit finance, strong crisis-induced devaluation of the currency) and some differences to Russia (more prudent reaction of the authorities in Kyiv, avoidance of outright default).

Given its history and dual geopolitical orientation (eastern Ukraine traditionally gravitating toward Russia, western Ukraine assertive and looking to the West), the country's leaders have been performing a balancing act, but in recent years have more and more favored the "European choice" and tilted Ukraine toward the West. The European Union and Ukraine signed a Partnership and Cooperation Agreement in 1995, which entered into force in 1998. In 1997, Ukraine and Russia concluded a Treaty for Friendship, Cooperation and Partnership. In the same year, a Charter of Special Partnership started to govern Ukrainian relations with NATO. In December 1999, the European Council adopted a Common EU Strategy on Ukraine, one of the nonbinding goals of which is to negotiate a free trade zone with Ukraine once the country has joined the World Trade Organization (WTO).

In 2002, Ukraine declared its goal of joining the EU and Euro-Atlantic structures such as NATO. In September 2003, the presidents of the Russian Federation, Ukraine, Belarus and Kazakhstan signed an agreement to create a Common Economic Space (CES), which Ukraine identifies with the goal of establishing a free trade area between the four countries as long as this does not jeopardize its aspirations to integrate with the EU. With the EU's latest round of enlargement in May 2004, the European Union and Ukraine have become direct neighbors. Ukraine is considered a priority partner country within the European Neighborhood Policy (ENP), and in February 2005, a joint EU-Ukraine Action Plan was endorsed, which focuses on helping Ukraine consolidate its "European choice" by harnessing further reforms. However, the European Union has not accepted Ukraine's request for becoming a candidate

for EU membership. In December 2005 the EU, and in February 2006 the United States, acknowledged Ukraine as a market economy, which should strengthen the country's position in antidumping cases. WTO accession appears probable in late 2006.

Assistance from the International Monetary Fund (IMF) used to be of major importance for Ukraine, especially during the difficult period following the 1998 crisis, when the country's solvency was severely stretched. However, respective programs were often interrupted owing to nonobservance of performance criteria or failure to fully implement agreed-upon reforms. Most recently, a 12-month Stand-by Arrangement that was treated as precautionary by the authorities veered off track in the summer of 2004 and formally expired in March 2005.

### **3 Macroeconomic Developments and Structural Adjustment since 2000**

#### **3.1 Driving Forces behind the Turnaround and Recovery of 2000–2004 and the Slowdown of 2005**

By the end of the 1990s, the steep and persistent economic decline in Ukraine had entailed a substantial drop in real wages and had left sizeable industrial capacities idle. In this situation, the strong depreciation of the Ukrainian hryvnia triggered by the 1998 crisis and the strong recovery that took hold of Ukraine's largest trading partner, Russia, in 1999 may have been two factors that started to change the overall economic environment for Ukraine. Successful macrostabilization measures in the wake of the crisis contributed to calming the situation. After a decline in 1998, Ukrainian GDP remained almost flat in 1999 (table 1).

The weakening of the hryvnia was not abrupt and sharp, but spread out over late 1998 and most of 1999. From September 1998 through end-1999, the Ukrainian currency's real effective exchange rate fell by about one-quarter. Not unlike developments in Russia, the depreciation triggered growth in some industrial sectors via import substitution (food processing, light industry) as well as in others via export expansion (metals, chemicals). Export expansion initially focused on products in demand in Russia (subject to the inherited division of labor between the two republics), but then spread to other markets, as growth there picked up and world market prices started to rise (Halushka, 2003, pp. 131–132). The industrial rebound produced a sharp turnaround of the previously negative current account balance in 1999; the surplus increased in the following year.

In 2000, world market prices of ferrous and nonferrous metals as well as of oil, refined petroleum products and chemicals started to grow strongly, contributing to a substantial improvement in Ukraine's terms of trade since energy (particularly gas) inputs coming from Russia and other CIS countries stayed relatively cheap despite recurrent nonpayment problems. Cumulative effects of past structural change as well as some important reform efforts of the administration that came to power in early 2000 and held office until early 2001 under then Prime Minister Yushchenko contributed to the breakthrough to positive GDP growth in 2000 and to the continuation of high levels of expansion in the following years. Traditional industries "learned by doing,"

i.e. by adjusting production to market requirements; managers also quickly reacted to antidumping problems in Western markets by reorienting sales to Asian countries (Berengaut et al., 2002, pp. 34–38). Thus, with limited actual downsizing and modernization, Ukraine's Soviet era industries achieved a remarkable degree of competitiveness. The land reform of 2000 (dissolution of former kolkhozes) and the reduction of government interference in agriculture contributed to a long-awaited agricultural rebound at the beginning of the new decade. The authorities also stepped up privatization activities and enacted a new banking law in early 2001.

Overall prudent fiscal and monetary policies, the simplification of tax rules and their enforcement as well as the administration's insistence on increasing cash collections in the energy sector served to strengthen payments discipline and boost confidence in the economy. Growing confidence was also reflected in rapid remonetization tendencies and the reduction of nonmonetary transactions. Accordingly, expanding demand for money facilitated monetary accommodation measures by the Ukrainian central bank (National Bank of Ukraine – NBU) through unsterilized interventions on the foreign exchange markets (starting in 2000) to fend off appreciation pressures on the hryvnia and support the newly found competitiveness of Ukraine's industries. As of early 2000, the external value of the national currency was de facto pegged to the U.S. dollar. In this situation, monetary accommodation appeared to provide room for production expansion without rekindling inflation as long as there were sufficient idle capacities.

Another important factor underpinning the upswing was swiftly rising private consumption, which started out from a very low level and then boomed on the back of strong wage and pension increases in 2001 and the following years.<sup>3</sup> Later on, notably in 2003 and 2004 and driven by exporters' and consumer industries' profits, private investment, including foreign direct investment (FDI), joined the factors propelling growth. Yet FDI inflows per capita remained far below those observed in most transition countries, including CIS neighbors, given the quite challenging Ukrainian investment climate. Economic expansion was further supported by a surge in private sector credit in recent years. In 2004, most of the above-mentioned factors were at work simultaneously, accounting for the growth spurt that year (table 1), while at the same time capacity bottlenecks started to show.

Likewise, the abrupt slowdown of growth in 2005 was triggered by the confluence of unfavorable factors. The temporary political turmoil surrounding the tumultuous elections and change of government of late 2004 triggered a near-banking crisis which temporarily cut credit expansion (see also subsection 3.2.3). This had knock-on effects on capital formation, which also suffered from economic uncertainty emanating from the new government's confusing review of the earlier privatization process and related disputes. However, the second half of the year was punctuated by some important FDI deals

<sup>3</sup> Thus, to some degree, the "timing" of wage developments may have been fortunate for the unfolding of the Ukrainian recovery: The strong contraction of real wages in the 1990s reduced the costs of – hardly restructured – Ukrainian heavy industries. Once further advances in competitiveness had been achieved by currency devaluation and rising external demand, there was room for a beneficial effect of strong wage and pension adjustments on growth, given that there continued to be ample idle capacities.

Table 1

**Overview: Ukrainian Macroeconomic Indicators 1995–2005**

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005 <sup>1</sup>
GDP growth (real annual change in %)	-12.2	-10.0	-3.0	-1.9	-0.2	5.9	9.2	5.2	9.4	12.1	2.6
Gross industrial production (real annual change in %)	-12.0	-5.1	-0.3	-1.0	4.0	13.2	14.3	7.0	15.8	12.5	3.1
Gross agricultural production (real annual change in %)	-3.6	-9.5	-1.8	-9.6	-6.9	9.8	10.2	1.2	-11.0	19.9	0.0
Consumer price inflation (year-end, %)	181.7	39.7	10.1	20.0	19.2	25.8	6.1	-0.6	8.2	12.3	10.3
Unemployment rate (year-end, ILO definition, %)	x	x	9.7	11.5	12.4	12.2	11.2	11.1	9.0	8.7	8.2
Consolidated government budget balance (% of GDP) <sup>2</sup>	-4.9	-3.2	-5.4	-2.8	-2.4	-1.3	-1.6	0.5	-0.9	-4.4	-2.5
Merchandise trade balance (% of GDP)	-7.3	-9.8	-8.5	-6.2	0.8	2.5	0.5	1.7	-0.5	5.8	-1.1
Current account balance (% of GDP)	-3.1	-2.7	-2.7	-3.1	5.2	4.7	3.7	7.5	5.8	10.5	3.0
Exchange rate UAH/EUR (annual average) <sup>3</sup>	x	x	2.1	2.8	4.4	5.0	4.8	5.0	6.0	6.6	6.4
Exchange rate UAH/USD (annual average) <sup>3</sup>	1.5	1.8	1.9	2.5	4.1	5.4	5.4	5.3	5.3	5.3	5.1
External debt (end-year, % of GDP)	21.4	19.8	19.2	28.6	42.8	37.8	31.8	30.1	29.4	31.1	31.8

Source: Derzhkomstat, NBU, EBRD, wiiw.

<sup>1</sup> Preliminary data or estimates.

<sup>2</sup> Consolidated government comprises the central government, local authorities, and social funds.

<sup>3</sup> The Ukraine hryvnia replaced the Ukraine karbovanets in September 1996, but the average annual rates prior to 1997 are shown in Ukraine hryvnia for convenience.

Given the slowing global economy, demand for – and prices of – Ukrainian export staples (metals, chemicals, refined petroleum products) declined again or leveled off, halting the country's terms-of-trade gains and curbing its current account surplus. Ukraine's industries lost some of their competitiveness due to real appreciation tendencies of the currency, mainly on the back of rising inflation driven by the fiscal relaxation around the 2004 elections and by some capacity constraints that took effect (Shiells, 2006). Pushed by further salary and pension hikes, consumer demand was the only factor continuing to fully support growth in 2005.

### 3.2 Macroeconomic Developments and Policies

#### 3.2.1 GDP Developments

Looking at GDP development from the supply side, industry, transportation and particularly trade were the drivers of growth in the period from 2000 to 2004. While it was punctuated by bouts of expansion (notably from 2000 to 2001), agriculture behaved more like a roller coaster and on the whole has been somewhat losing importance. Although final supply-side data for 2005 were not yet available at the time of writing, industry and agriculture can be assumed to have contributed to the sharp economic slowdown observed in that year. The evolution of demand components (table 2) clearly shows that Ukraine's foreign trade orientation increased over the years until 2004, before suffering a setback in 2005: The shares of exports and imports in GDP steadily expanded and then suddenly shrank. This expansion and the subsequent contraction can be explained by pronounced terms-of-trade developments and adjustments to changing demand (see section 2). They also show the risks of an economy heavily dependent on staple prices. Household – but not government – consumption constitutes one of the demand-side driving forces behind the Ukrainian economic expansion in the period from 2001 to 2005. Gross fixed capital formation gained momentum in 2003 and 2004, but then, facing a tougher economic and investment climate, lost steam in 2005.

Table 2

	Growth (real annual change in %)					Structure (share in total GDP in %)				
	1999	2001	2003	2004	2005 <sup>1</sup>	1999	2001	2003	2004	2005 <sup>1</sup>
	Total GDP	-0.2	9.2	9.4	12.1	2.6	100	100	100	100
of which:										
Final consumption	-5.5	11.1	9.6	9.0	12.7	77.1	76.5	75.4	73.3	77.7
households	-3.9	10.4	8.6	10.3	15.9	54.7	54.9	54.7	53.8	56.9
government	-7.6	15.1	13.2	6.8	4.1	19.9	19.6	19.0	18.1	19.5
Gross accumulation of fixed assets	-2.2	9.8	17.6	9.9	-4.0	19.2	19.7	20.6	20.2	..
Change in inventories	x	x	53	x	..	-1.8	2.1	1.4	-1.0	..
Exports of goods and services	29.6	-2.9	15.0	18.9	-13.6	54.4	55.5	57.8	61.3	51.9
Imports of goods and services	10.2	2.4	19.3	9.1	-0.8	-48.8	-53.8	-55.2	-53.7	-51.4

Source: Derzhkomstat, IMF, wiw, authors' calculations.

<sup>1</sup> Preliminary data or estimates.

### 3.2.2 Fiscal Policy and Tax Reforms

Buoyed by swift economic growth, which started in 2000 after a period of economic contraction that had been observed up to 1999, the government's fiscal results improved considerably compared to what their level had been in the second half of the 1990s (table 1). At the turn of the millennium, high consolidated budget deficits turned into near-balanced budgets or even small surpluses – a trend that continued up to 2003. Debt service payments exceeded 2% of GDP in the time from 1999 to 2001 and therefore necessitated primary surpluses in this period (table 3). However, the Ukrainian tax system has traditionally been overly complex and has suffered from serious distortions, non-compliance and inefficiencies. The new administration that came to power in 2000 made an important effort to streamline the system, cancel some discretionary tax exemptions, enhance tax administration, improve cash management and clear public spending arrears. It was successful in raising payments discipline. The new administration also attempted to rein in the practice of offsetting or netting overdue tax obligations against public expenditure arrears.

However, these efforts were interrupted and in some cases weakened by the granting of a tax amnesty in April 2001 and the ad-hoc extension of new tax loopholes to various industries (including metals, chemicals and engineering, i.e. major exporting sectors) as well as the rapid accumulation of new arrears, mainly reflecting noncompliance in the energy sector.<sup>4</sup> In July 2001 a new budget code was enacted, which modernized inherited Soviet tax collection methods (the kartoteka approach). A single treasury account became operational in mid-2002. After attaining high levels as a ratio of GDP at the turn of the millennium, public debt declined in the following years, reaching about 25% in 2004. Yet tax breaks continued to flourish.<sup>5</sup>

<sup>4</sup> One could argue that these new instances of nonpayment were implicitly encouraged by the tax amnesty.

<sup>5</sup> For the central government budget, the cost of tax preferences (nonstandard exemptions and privileges) in 2003 came to 17% of tax revenue (IMF, 2003a, p. 16).

Table 3

**Consolidated Government Budget<sup>1</sup> and Public Debt 1999–2005 (% of GDP)**

	1999	2000	2001	2002	2003	2004	2005 <sup>2</sup>
Revenue	33.8	33.4	33.5	36.0	35.9	35.0	42.3
Expenditures	36.1	34.7	35.1	35.5	36.8	39.4	44.8
of which: interest payments	2.6	3.1	2.0	1.3	1.0	0.9	0.8
Cash balance	-2.4	-1.3	-1.6	0.5	-0.9	-4.4	-2.5
Commitments balance <sup>3</sup>	-1.4	2.1	-1.5	0.2	-0.1	-3.6	..
Privatization proceeds	0.6	1.3	1.3	0.5	1.1	3.1	5.2
Net foreign financing	0.2	-0.3	0.4	-0.7	1.0	1.5	0.7
Public debt and arrears <sup>4</sup>	66.7	47.7	38.6	35.7	27.7	25.1	19.7
Memorandum item: GDP growth (real change in %)	-0.2	5.9	9.2	5.2	9.6	12.1	2.6

Source: Ministry of finance, IMF.

<sup>1</sup> Consolidated government includes the central government, local authorities and social funds.

<sup>2</sup> Preliminary data or estimates.

<sup>3</sup> Cash balance adjusted for net change in arrears (e.g. with respect to VAT refunds) and for noncash property income.

<sup>4</sup> Government and government-guaranteed liabilities and arrears, plus NBU debt. Excludes debt of state-owned enterprises.

A new tax reform initiative was launched in 2004, when corporate and personal income taxes were radically simplified: In both cases, tax rates were reduced to uniform single rates of 25% (corporate tax) and 13% (income tax). In return, respective tax bases were broadened and preferences and benefits were eliminated.<sup>6</sup> In the environment of the accelerating economic expansion of 2004 the change to flat taxes had a positive effect on revenues (Duchêne and Dubien, 2005, pp. 48, 52). On the other hand and for other reasons, 2004 signaled the end –or at least an interruption –of the period of prudent fiscal policies. In view of the presidential elections of late 2004, the authorities pushed up public spending. They raised pensions and stepped up clearing wage arrears and distributing tax privileges. Despite record GDP growth that year, the budget cash deficit grew to 4.4% of GDP. The new government of 2005, which was itself under pressure to prepare for the parliamentary elections of early 2006, largely continued the previous administration's expansionary social policies, but matched them with tax increases in other areas, some closures of loopholes and a tightening of fiscal administration. However, given the sharp economic slowdown in 2005, the budget shortfall remained relatively high at 2.5% (table 3). Covering the deficits was not a problem in 2004 and 2005, owing to strongly expanding privatization receipts.<sup>7</sup>

### 3.2.3 Monetary and Exchange Rate Policy

Following successful macrostabilization efforts in the wake of the 1998 financial collapse, Ukrainian monetary and exchange rate strategies seem to have been well orchestrated and may also have had a lucky touch in guiding remonetization and setting the stage for the financial deepening of the still fragile economy. After some impressive results achieved in the first years of the new millennium, inflationary pressures resurfaced, however, in 2004 and 2005.

<sup>6</sup> The income tax reform followed the example of Russia, which had adopted a flat personal income tax of 13% two years earlier.

<sup>7</sup> The reprivatization of the steel plant Kryvorizhstal in November 2005 alone produced net receipts (after refunding the plant's previous owners) of around 5% of GDP.

In the post-crisis situation of 1999 and against the backdrop of the country's delicate financial situation, monetary policy was still burdened by the government's heavy reliance on NBU financing. The Ukrainian hryvnia continued to weaken steadily throughout the year. Yet the breakthrough to economic growth in 2000, major improvements in fiscal and budgetary policies and practices as well as the positive swing in the country's external accounts supported decisive changes in monetary policymaking. Since January 2000, the NBU has defended a de facto peg of the hryvnia to the U.S. dollar at the exchange rate level of end-1999 within the formal framework of a managed float. Thus the U.S. dollar has served as a highly visible external nominal anchor, which managed to calm inflation expectations. Given Ukraine's newly found exchange rate-driven competitiveness, which was soon enhanced by world market price gains for the country's main export staples, rising current account surpluses produced upward pressures on the currency, which the NBU countered by expanding foreign exchange purchases. These interventions have served to gradually build up the NBU's modest external reserve position, but have largely been unsterilized, thus raising the money supply (table 4).

However, rising confidence and the continuing robust economic recovery contributed to boosting money demand, thus enabling a swift process of remonetization. Thanks also to the fact that government policies insisted on promoting cash payments, the weight of barter transactions and enterprise arrears was reduced. Velocity of money declined and inflation remained relatively low for some years. Thus, monetary expansion effectively accommodated an increase in money demand. The rise in CPI inflation to 26% at end-2000 was strongly influenced by adjustments in administered prices (notably communal tariffs) which had been put off until after the elections of the fall of 1999. While the monetary authority at times hiked mandatory reserve requirements, the only substantial sterilization measures were undertaken by the government, which generally conducted prudent fiscal policies up to 2003 and which temporarily accumulated deposits with the NBU.

Liquidity inflows and the favorable environment allowed banks to expand their (hitherto modest) lending to the private sector at a very rapid pace, bringing about a credit boom. From end-1999 to mid-2005, the average annual growth of commercial bank lending to the economy came to about one-third in real terms. Real credit expansion accelerated until 2003, when it reached 55%, but then some momentum was lost in 2004 (see below).<sup>8</sup> The decline of inflation to near-zero levels in 2002 was largely connected to temporary factors, namely the good harvests in 2001 and 2002 and the resulting sharp drop in food prices as well as renewed delays in adjusting administered prices and spillover effects of flat producer prices in 2001. However, the bad harvest of 2003 contributed to ratcheting up the price level that year.<sup>9</sup> In the same year, producer price inflation gathered momentum, and it further accelerated in 2004 owing to rising prices of oil and metals. After interest rates had fallen to

<sup>8</sup> For more information on Ukrainian banking developments since the turn of the millennium, see Barisitz (2004).

<sup>9</sup> The rather erratic development of agricultural production seems to constitute something of a "swing factor" for Ukrainian economic and foreign trade activities and price dynamics.

negative real levels by 2003, the NBU responded to the resurgence of retail price inflation by hiking its policy rates back up again in 2004 and early 2005 and by raising reserve requirements.

The fiscal loosening of 2004, which was only partially reined in the following year, augmented aggregate demand in a situation when production appeared to be nearing capacity bottlenecks, and some sectors, like housing construction and metallurgy, seemed to be overheating (IMF, 2004, p. 16). Rising inflationary pressures and a near-banking crisis triggered by the political instability and change of government in late 2004 (see below) halted or reversed money demand growth and interrupted remonetization tendencies. After it had continually fallen since 1999, the dollarization of the Ukrainian economy started to grow again in the fall of 2004 (Duchêne and Dubien, 2005, p. 51). These factors came on top of a record external surplus that produced further major liquidity inflows in 2004. The result was double-digit inflation at end-2004 (12.3%), as shown in table 4.

The near-banking crisis evolved in the following manner: The political turmoil of late 2004 combined with fragile confidence in the banking sector put the hryvnia under pressure. Depositors – mostly in Eastern Ukraine – stepped up withdrawals from bank accounts (which attained 17% of total Ukrainian household deposits) and changed their money into foreign currencies. Capital flight gained momentum. The NBU reined in the impact of these runs with a package of measures combining administrative restrictions, the granting of stabilization loans to some banks and foreign exchange interventions. By February 2005, calm had largely returned; restrictions were lifted and bank accounts and reserves were filling up again (Astrov, 2005, p. 105). After sharply decelerating to 18% in 2004, real credit growth regained some momentum in 2005 (+25% in the period from January to September 2005, year on year).

Despite the intermittent slowdown, the Ukrainian loans-to-GDP ratio more than tripled from 9% at end-1999 to almost 31% in June 2005, which corresponds to one of the most rapid expansions so far experienced in transition economies (table 4).<sup>10</sup> Given existing structural weaknesses, the speed of credit growth has raised financial and macroeconomic concerns. Owing to the stability of the exchange rate in recent years, to nominal hryvnia appreciation pressures and to lower interest rates on foreign currency-denominated loans, taking up foreign exchange loans has been quite popular, if risky: Almost 40% of all credits taken up in Ukraine are denominated in foreign exchange – in a situation characterized by a high number of unhedged borrowers.

In April 2005, the NBU slightly revalued (+3%) the national currency, but then continued to defend the new stable exchange rate. Despite this revaluation and notwithstanding the sharp drop of economic growth and of the external surplus in 2005, further increases in social spending as well as new post-election hikes in administrative prices contributed to keeping inflation in double digits that year. Although the real effective exchange rate of the hryvnia, which had slightly depreciated since 2000, reappreciated again in

<sup>10</sup> However, this expansion proceeded from a very low point of departure, and levels attained are still quite modest compared to developed market economies.

Table 4

Monetary Indicators							
	1999	2000	2001	2002	2003	2004	2005 <sup>1</sup>
Consumer prices (year-end, change in %)	19.2	25.8	6.1	-0.6	8.2	12.3	10.3
Producer prices (year-end, change in %)	15.7	20.6	0.9	5.7	11.1	24.1	9.5
Base money (M1, year-end, change in %)	39.2	40.1	37.4	33.6	30.1	34.1	46.9
Broad money (M2, year-end, change in %)	40.4	45.5	41.9	41.8	46.5	32.3	54.3
Refinancing rate (year-end, %)	45.0	27.0	12.5	7.0	7.0	9.0	9.5
Credit (credit volume to GDP, %)	9.0	12.4	14.5	19.4	26.6	27.1	30.7 <sup>2</sup>
Credit growth (real, %)	24.2	36.0	34.5	48.1	54.5	18.5	20.0 <sup>2</sup>
Deposit rate (average, year-end, % p.a.)	20.7	13.7	11.0	7.9	7.0	7.8	10.0
Lending rate (average, year-end, % p.a.)	55.0	41.5	32.3	25.4	17.9	17.4	16.5
Exchange rate UAH/EUR (annual average)	4.4	5.0	4.8	5.0	6.0	6.6	6.4
Exchange rate UAH/USD (annual average)	4.1	5.4	5.4	5.3	5.3	5.3	5.13
Real effective exchange rate (annual average, change in %) <sup>3</sup>	-16.3	-4.4	+6.0	-4.1	-6.3	-0.9	+12.0

Source: Derzhkomstat, NBU, IMF, EBRD, wiw, authors' estimates.

<sup>1</sup> Preliminary data or estimates.

<sup>2</sup> Mid-2005.

<sup>3</sup> (+) corresponds to real appreciation; based on CPI and average trade weights for 1996–2002.

2005, competitiveness has been broadly maintained, judging from Ukrainian wage and price levels that stood at only about half of the comparable Russian levels in September 2005.

### 3.2.4 Balance of Payments and External Debt

Ukraine is a quite open economy for its size. As noted above, the shares of exports and imports in GDP have been increasing and have reached levels of around 55% to 60%. While the 1998 crisis had brought Ukraine in a serious financial situation, putting the country at the brink of bankruptcy for two years, the brightening of the external environment at the turn of the millennium and the ensuing strong current account surpluses dispelled solvency problems. The external deterioration in 2005 met a country equipped with a fair amount of foreign exchange reserves (table 5).

Ukraine's payment difficulties triggered by the financial collapse of 1998 and the following large-scale devaluation pushed up external liabilities as a share of GDP. Yet at the same time, the devaluation coupled with fortunate price gains on international markets and significant idle capacities sharply improved Ukraine's cost and price competitiveness and reversed the country's terms-of-trade and external position, creating a chain of sizeable current account surpluses and entailing years of respectable growth. In addition, Ukraine reached debt rescheduling agreements with the creditors of the London Club (April 2000) and the Paris Club (July 2001), which eased the debt service burden. Payment arrears of the Ukrainian monopoly gas supplier Naftogaz Ukraini to Gazprom (Russia) amounting to about USD 1.4 billion were rescheduled in October 2001 (Bon and Duchêne, 2001, p. 181). Foreign public debt declined to one-fifth of GDP by end-2004.

Other factors that added to Ukraine's favorable current account position were expanding service receipts for Russian oil and gas transit to Central and Western Europe and rising current transfers consisting of remittances (mostly from Ukrainians working in Russia) and compensation payments for forced labor in World War II, which the country has received since 2001. After being

confronted with a mounting number of antidumping actions and threats pertaining to Ukrainian products like steel, rubber and fertilizer and coming from their main trading partners (notably the EU, Russia and the U.S.A.), Ukrainian manufacturers successfully ventured into other markets especially in Asia and Africa. The particularly large current account surplus of 2004 was caused by a continued positive terms-of-trade shock, which reflected exceptionally high staple prices,<sup>11</sup> as well as by strong demand from the booming Russian and Chinese economies. The abrupt halt and partial reversal of the favorable terms-of-trade dynamics in 2005, the rising inflation-induced real appreciation of the exchange rate, the slowing of global demand (including demand for metals) as well as buoyant domestic household spending pushed the trade balance into the red and produced a strong contraction of the current account surplus that year (table 5).

Given limited restructuring, including weak or insufficient FDI, the content of Ukraine's exports has not evolved much since the turn of the millennium. Traditional, low value-added products continue to dominate the market: Metals, chemicals and energy products made up 62% of total exports in 1999, and continued to do so in 2004, although relative price increases for these staples masked a degree of real contraction. While the share of fuel and energy in total imports declined in this period from 46% to 36%, it is still predominant. The latter percentages are downward biased because a considerable part of energy, particularly natural gas, is imported at prices that are far below world market levels. The share of machinery grew from less than one-fifth to over one-quarter of imports. Chart 1 reveals that Russia is still Ukraine's largest trading partner as a country, although the enlarged EU overtook Russia and the CIS as an export destination in 2004. Given the continuing long-term effects of Soviet disintegration and the global economic reintegration of Ukraine, Russia's and the CIS' share in Ukrainian foreign trade decreased further in recent years, but this decrease has been slowing down in the light of Russia's and its neighbors' robust growth.

On the import side, Ukraine's strong dependence on energy reflects Russia's undisputed dominance (chart 1): Over 40% of Ukraine's imports came from its big northern and eastern neighbor in 2004; more than half of the country's imports are purchased from CIS members, with Turkmenistan as the second-largest energy supplier. These shares would be even higher if world market energy prices were applied. Still, the EU-25 are clearly the second-most important trading area for Ukraine and enlarged their share in Ukraine's imports to over one-third in recent years. In view of this specific trade pattern and record, one may wonder about the viability and sustainability of what might be called a "Ukrainian growth model," i.e. a model which is characterized by the production and export of low-tech and price-sensitive heavy industrial goods on the world market, which in turn are based inter alia on imports of cheap Russian and CIS energy. This question appears relevant in connection with the latest Russian-Ukrainian gas agreement, which was con-

<sup>11</sup> *Altogether, according to IMF estimates, Ukraine accumulated terms-of-trade gains during the period from 2000 to 2004 that amounted to about 24%, thus corresponding to a positive current account impact of 1.2% of GDP (Davis et al. 2005, p. 18).*

Table 5

Balance of Payments and External Debt 1999–2005 (% of GDP)							
	1999	2000	2001	2002	2003	2004	2005 <sup>1</sup>
Merchandise exports	41.4	50.3	44.9	44.0	47.3	51.4	44.3
Merchandise imports	-40.6	-47.8	-44.4	-42.3	-47.8	-45.6	-45.5
Services receipts	12.1	12.2	10.5	11.0	10.4	9.7	7.4
Services payments	-7.2	-9.6	-9.4	-8.3	-7.3	-7.9	-6.1
Income (net)	-2.7	-3.0	-1.8	-1.4	-1.2	-1.0	..
Current transfers (net)	2.2	2.7	3.8	4.5	4.4	4.0	..
Current account	5.2	4.7	3.7	7.5	5.8	10.5	3.0
Direct investments (net)	1.5	1.9	2.0	1.6	2.8	2.6	9.2
Portfolio equity	0.4	-0.6	-1.9	-4.6	-3.4	-2.0	..
Bonds and medium- and long-term loans (net)	-0.5	-0.3	-0.3	0.9	2.6	6.3	..
Short-term capital (including net payables) <sup>2</sup>	-0.3	-3.2	0.5	-0.4	-1.3	-13.5	..
Capital and financial account	-1.6	-2.2	0.3	-2.5	0.6	-6.5	9.8
Gross international reserves (change) <sup>3</sup>	-0.9	-1.3	-4.2	-2.5	-4.1	-3.4	..
Total external debt	42.8	37.8	31.8	30.1	29.4	31.1	31.8
Gross international reserves (year-end)	3.4	4.8	8.1	10.4	13.8	14.6	24.6
Debt service (% of exports of goods and services)	16.6	10.4	6.7	5.4	6.2	4.8	4.9
Terms of trade (change in %)	9.2	-8.2	1.3	1.6	8.6	16.4	0
Memorandum item: GDP in billion euro (current prices)	26.7	33.8	42.4	44.9	44.40	52.2	65.4

Source: Derzhkomstat, NBU, IMF, authors' estimates.

<sup>1</sup> Preliminary data or estimates.

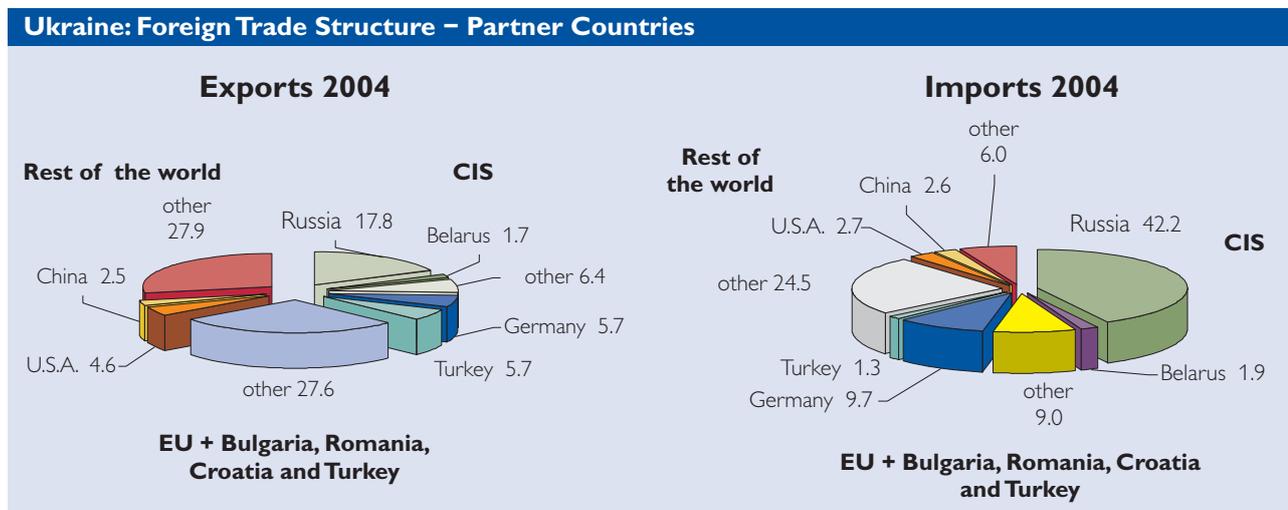
<sup>2</sup> Including barter settlements to clear outstanding arrears to Russia.

<sup>3</sup> (-) corresponds to an increase in percentage points of GDP.

cluded in January 2006 and which provides for an immediate near-doubling of Naftogaz Ukraini's gas purchase price right at the Russian border.<sup>12</sup>

Notwithstanding a political situation that continues to be less than stable, one should note that in recent months inward FDI turned into a substantial item in the Ukrainian balance of payments. The first major deal was Raiffeisen's purchase in October 2005 of a 93.5% stake in the country's second-largest credit institution (measured by assets), Avalbank, for about EUR 850 million. This move was followed by the successful reauction (reprivatization)

Chart 1



Source: Derzhkomstat, NBU, IMF.

<sup>12</sup> For more details on the energy sector, see section 3.3. For possible implications of the gas price increase, see section 4.

in November of the giant steel company Kryvorizhstal, which was sold for almost EUR 4 billion to the British-Indian Mittal corporation. Another important deal was BNP Paribas' takeover in December of a 51% stake in the fifth-largest bank, Ukrsibbank, for EUR 420 million, followed in February 2006 by Banca Intesa's acquisition of 85% of Ukrsotsbank, the fourth-largest bank, for EUR 900 million. These transactions have contributed to boosting the country's foreign exchange reserves, which topped EUR 16 billion at end-2005.

### 3.3 Energy Sector Developments and Reforms

Energy plays a pivotal role for production, import dependence, export revenues and consumption activities in Ukraine. Energy intensity (energy use per unit of GDP) is extremely high in Ukraine and, according to the EBRD, was the highest of any European country in 1999 and a multiple of the Western average (EBRD, 2001, pp. 91–92). This is largely connected with inefficient and aging industrial technologies. About a quarter of Ukraine's gross industrial production and a third of the country's imports consist of energy products. The main components of the energy sector are coal, oil and natural gas; accounting for around half of energy imports, use and consumption, natural gas is the most important energy source.

#### Coal

Coal accounts for a quarter of Ukraine's primary energy supply. Most of it is mined domestically and used in industries such as the steel industry (Davis, 2005, p. 5). As of 2002, prices set for coal produced in Ukraine amounted to about half the level of world prices, which implies that substantial implicit subsidies have been passed on to enterprises in other sectors. The coal industry consists of over 200 mines. Given low prices, chronic underinvestment and outdated equipment, most coal mines are loss-making, and the budget transfers annual subsidies to the industry that amount to about 5% of central government expenditure or 1% of GDP. Ukraine's coal mines are among the world's most accident-prone. After repeated delays, bankruptcy proceedings have been opened against around 100 mines.

#### Oil

Crude oil makes up about one-fifth of Ukraine's primary energy supply; about 90% of this oil is imported. Oil purchased abroad originates almost exclusively in Russia, with minor quantities being imported from Kazakhstan. Until recently, Ukraine's oil prices had been well below world prices (in this case, Urals grade crude) – a reflection of preferential contracts with Russia. Since the partial liberalization of the oil trade in 2002, however, Ukraine's oil import prices have converged substantially, and the differential to the world price level may currently only be a few percentage points. In this context, it has been estimated that full adjustment to world prices would subtract some quarter of a percentage point of GDP from Ukraine's current account balance (Halikias, 2005, p. 36).

After the recent privatization sale of some of the country's six oil refineries to Russian investors, their capacity utilization, which previously had been very low, has increased markedly. Ukraine is a key transit country for Russian oil

exports, hosting part of the Southern Druzhba oil pipeline, Russia's main over-land export route, as well as the Prydniprovsky pipeline. The steep oil price hikes of recent years have had substantial effects on the Ukrainian economy, which, however, have been largely offset by strengthening economic activity and thus higher import demand in Russia, a key destination of Ukraine's exports<sup>13</sup>, and by increasing revenues from Russian oil transit.

#### Gas

Ukraine enjoys a key strategic location on the European East-West gas transportation corridor. 80% to 90% of Russia's natural gas exports to Central and Western Europe transit through Ukraine (mainly through the Soyuz and Progress pipelines). For this transit of about 115 billion cubic meters annually, Ukraine receives around 25 billion cubic meters worth of gas as in-kind payment. Ukraine further consumes 29 billion cubic meters of gas a year from Turkmenistan (delivered through Russian territory). Ukraine's own production for domestic consumption comes to about 18 billion cubic meters. The country's gas sector is dominated by the state-owned holding company Naftogaz Ukraini (founded in 1998), which is in charge of gas production, import, distribution and transit.

In contrast to external oil prices, external gas prices are not market-dominated, but continue to depend on political factors and leverage. Given that Ukraine is a near-monopolist for Russian gas exports to Central and Western Europe, and that Turkmenistan and other Central Asian countries have limited options for export outlets, Ukraine has considerable leverage in price negotiations with Russia and other CIS members. Since the breakup of the Soviet Union, there have been repeated occasions of payment delays, supply cutoffs, debt restructuring negotiations, barter arrangements, new arrears, etc.<sup>14</sup> Until most recently, no moves toward convergence with world gas prices could be detected. As of end-2005, the European parity price was above USD 200 per 1,000 cubic meters (Davis et al., 2005, p. 9). For several years, Russia has continued to provide gas to Ukraine at a rate of USD 50 per 1,000 cubic meters. Earlier in 2005, Ukraine and Turkmenistan negotiated a gas price of USD 44 per 1000 cubic meters, which means USD 60 at Ukraine's border after Russian transport costs are added.<sup>15</sup>

About one-third of this cheap gas helps subsidize energy-intensive industries, notably export-oriented branches (like fertilizer, chemicals and steel production), one-sixth is consumed by commercial and public services, another third is delivered to the residential (household) sector on the basis of regulated below-cost prices (implying additional budgetary or cross-subsidization). Implicit gas subsidies to the economy are estimated to reach about 2% to 3% of GDP per year. Therefore, transition to less energy-intensive technologies

<sup>13</sup> However, the establishment of the Russian oil stabilization fund in 2004 introduced a stability factor which, in the immediate future, will tend to moderate the potential growth of export demand from Russia.

<sup>14</sup> Some reports claim that Ukraine resorted to unauthorized siphoning of Russian transit gas (Saprykin, 2003, p. 189; Clement, 2002, p. 56). The flaring-up of Ukrainian-Russian gas disputes have at times also had repercussions (brief supply disruptions) on Central and Western European countries further down the supply line.

<sup>15</sup> However, Ukraine may lose some of its market power in the medium to long term, as Russian energy export projects circumvent Ukraine (and other transit countries), inter alia by constructing the Northern European Pipeline which directly links Russia and Western Europe (Germany) through the Baltic Sea.

may have been hindered by understated energy prices. The government of 2000–2001 – particularly former deputy prime minister Timoshenko, who was in charge of reforming the energy sector – proved to be quite successful in bringing about a dramatic increase in cash collection rates and enhancing domestic payment discipline in the sector (particularly gas and electricity). Successor governments continued these efforts. Rapid economic growth provided many energy consumers with higher revenues, which contributed to improving the situation.

Despite these advances, tariffs have remained insufficient to cover the gas sector's costs and investment needs. Coupled with inefficient management, weak maintenance and poor transparency, the long-term sustainability of the transit infrastructure may be in jeopardy. The new gas treaty with Russia (of early January 2006), which almost doubles external gas prices for Ukraine, constitutes a serious challenge for the financial integrity of Naftogaz and for large parts of the Ukrainian economy. While in the first months of 2006 budgetary intervention has helped to reduce the burden for the energy sector, painful price adjustments for industry and consumers can be expected for the near future.

#### **4 Outlook**

After five impressive years of strong growth and rapid catching-up, the sharp slowdown in 2005 recalled the fragility and volatility of Ukrainian economic developments and their foundations. It seems that in the coming years, Ukraine's economic prospects will be strongly influenced by two factors: the country's terms of trade and its political stability. The new Ukrainian-Russian gas deal, which almost doubles gas import prices at the Russian border, reportedly also pertains to gas deliveries from Turkmenistan and Kazakhstan that are sent to Ukraine via Russian territory or purchased by Russia and resold to Ukraine. While Gazprom claims to be able to earn the full USD 230 per 1,000 cubic meters it demanded in the negotiations, the lower overall price of USD 95 paid by Naftogaz is apparently reached by generously mixing cheaper central Asian gas into the quantities purchased. Transit tariffs for Russian gas deliveries through Ukraine will also increase, but only by about 45%, and they will not offset the gas price hike. While there appears to be conflicting information on the stipulated duration of the treaty, the nature of the deal described above would make it difficult to imagine Turkmenistan and Kazakhstan putting up with their relatively modest prices for long. Therefore, pressures for further adjustments toward world price levels can be expected.

Most experts believe that the new gas deal will have substantial repercussions for the Ukrainian economy, its external accounts, growth, and probably, longer-term structural development. Estimates of IMF, World Bank, Deutsche Bank and Raiffeisenbank (some of them hypothetical on the basis of simulations from the time before the gas deal was concluded) seem to converge around a negative impact on the current account amounting to 2 to 3 percentage points of GDP (mainly by deepening the trade deficit) and a negative impact on GDP growth coming to 1 to 2 percentage points in the first year (2006),

followed by a declining impact in subsequent years.<sup>16</sup> Given uncertainty as to the durability of the agreement, this result may bear a downside risk. Another issue in question is the price of steel, the major Ukrainian export staple. As a result of an overall profit squeeze, the financial situation of some export-oriented enterprises could seriously deteriorate. On a more positive note, the price shock could trigger energy saving investments which might contribute to finally weaning the country off its excessive energy dependence in the longer run.

Political instability may persist even after the parliamentary elections of March 2006, as the legislative branch will probably continue to reflect a fractured political landscape. In any case, notwithstanding the rada's increased powers according to the constitutional changes that came into force at the beginning of 2006, it may not be easy for the future government to muster the necessary political support to push ahead with a bold reform agenda. Banking is set to continue its fragile expansion, and new financial instability does not appear imminent, but could potentially be triggered by a new political crisis or sharp economic downturn, especially if one takes into account the recent credit boom.

While acknowledging that with all these uncertainties the margin of error is high, one might conclude that in 2006 the current account will probably be more or less in balance or slightly in the red, while GDP growth may remain around the (rather weak) level of 2005 (+2.6%) or perhaps slightly lower. Pushed by rising energy and utility prices, inflation is bound to stay above 10%. Real incomes are likely to expand at a somewhat slower rate in 2006 than in 2005, but should remain the main pillar of economic activity. Modest economic growth and increased budgetary energy subsidies are liable to widen the fiscal gap in 2006.

Equipped with sizable foreign exchange reserves, the NBU will probably continue to aim at keeping the exchange rate stable vis-à-vis the U.S. dollar. Yet, conditions for monetary policy have already adjusted somewhat. Since early 2006, large trade-connected foreign exchange inflows seem to have dried up, although FDI inflows may at least partially take their place.<sup>17</sup> Unless the country is in for a further energy and/or terms-of-trade shock in the short term – which cannot be excluded – recovery from the slow growth trough could start in 2007. But recovery will remain precarious until the energy-related retooling of industry, and the economy itself, has made appreciable progress. Competitive wages, growing FDI, the strengthening global economic integration of Ukraine, prospective WTO membership and increasing adherence to European standards should help stabilize economic expansion and facilitate restructuring in the coming years.

Editorial close: April 5, 2006.

<sup>16</sup> See *i.a.* Halikias 2005, pp. 35–38; Davis *et al.*, 2005; Paruk and Nystedt, 2006; Lechner, 2006; Budnyk and Zinovyev, 2006. In January to February 2006, Ukrainian GDP grew by 1.5% in real terms (year on year).

<sup>17</sup> In the first quarter of 2006, the NBU was reported to have spent over EUR 1.5 billion defending the hryvnia. In this period foreign exchange reserves declined by about 10% to EUR 14.4 billion. However, in the same time span, transactions committing new inward FDI of approximately EUR 1 billion were concluded.

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# HIGHLIGHTS

# Financial Development, Integration and Stability in Central, Eastern and South-Eastern Europe

*The OeNB's Conference on European Economic Integration 2005*

Compiled by  
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The OeNB's second Conference on European Economic Integration (CEEI; its predecessors were called East-West Conference) took place from November 14 to 15, 2005, in Vienna. The OeNB organized the CEEI 2005 together with the European Central Bank (ECB) and the Center for Financial Studies (CFS) in the context of the ECB-CFS research network on Capital Markets and Financial Integration in Europe. The conference was entitled "Financial Development, Integration and Stability in Central, Eastern and South-Eastern Europe" and featured keynote lectures, panel discussions and the presentation of more than 20 research papers. The organizers selected the latter from around 120 papers which had been submitted by researchers from central banks, research institutes and academia in response to a call for papers. In order to be able to accept a large number of papers for presentation, the paper presentations on the second day of the conference were held in two parallel sessions. Both features – the call for papers and the parallel sessions – represented a novelty in the history of the conference series. The conference met with an overwhelming response, with around 300 – partly high-ranking – participants coming from 35 countries, including representatives of international universities and Austrian commercial banks.

The conference was opened by OeNB Governor Klaus Liebscher, who explained why financial development and integration was chosen as the topic for the CEEI 2005. Liebscher pointed out that financial deepening in the New Member States (NMS) and the further integration of European financial markets would constitute milestones on the path to more growth and employment in the enlarged European Union. However, beside the positive effects of financial integration, its risks should not be overlooked. Integration will produce increasingly complex financial structures, creating new challenges for credit institutions, lawmakers, financial market supervisors and central banks. Efficient mechanisms of financial market surveillance at the national level, but also close cooperation at the European level, are needed. For central banks, financial market development and integration are also of interest from a monetary policy perspective, as central banks are intent on the efficient transmission of policy signals in the unified currency area and the smooth functioning of payment and clearing systems, Klaus Liebscher concluded.

In his opening keynote lecture, Cesare Calari, Vice President for the Financial Sector of the World Bank, concentrated on the benefits and pitfalls of financial globalization. Going into more detail on foreign participation in the financial sectors of Central and Eastern Europe, Calari stressed the benefits of foreign ownership in terms of technical and managerial improvements, economies of scale, better access to credit, more competition and greater financial stability. At the same time, increased competition among banks trying to

<sup>1</sup> Compiled on the basis of notes taken by Stephan Barisitz, Andreas Breitenfellner, Balázs Égert, Antje Hildebrandt, Klaus Michal, Gabriel Moser, Maria Antoinette Silgoner and Zoltan Walko.

maintain profitability may create a moral hazard problem. Also, in several cases in the region, the insufficient quality of a foreign entrant bank has resulted in dubious business activity, while the concentration of foreign ownership may expose the target country's banking system to adverse developments in the country of origin. Calari stressed the importance of market discipline and the need for regulatory convergence and the dissemination of best practice to mitigate risks.

The opening panel discussion under the chairmanship of Klaus Liebscher focused on "The Current State and Future Prospects for the CEE Financial Sector." Alexandre Lamfalussy, former president of the European Monetary Institute (the forerunner of the ECB), addressed emerging concerns over "excessive" consultation and "regulatory overload" by warning against simplistic costs-benefit calculations and an ideological divide. Lamfalussy recalled that the framework was only one precondition for genuine financial integration, overcoming protectionist instincts was another. Irmfried Schwimann, head of unit in the Directorate General Internal Market and Services of the European Commission, presented facts and figures on the Central and Eastern European (CEE) financial sector. The CEE financial system is largely bank based, but insurance, stock markets and funds are growing fast. A high level of foreign ownership raises issues on financial stability and cross-border supervision. Given fast integration, accelerated through the transposition of EU legislation, there was strong potential for further development, as Schwimann pointed out. Stefan Zapotocky, Joint CEO of Wiener Börse AG, invited regional players to form a "Central European Exchange Alliance" together with the recently merged Vienna and Budapest stock exchanges. Such an alliance would increase international visibility, strengthen local markets and reduce the dominance of global players. Citing Austria's successful experience, Zapotocky expected 100% growth in market capitalization in the next three years through the integration of these very fragmented markets. Cristian Popa, deputy governor of Banca Națională a României, cited the financial sector's small size, its rapid growth, booming household credits, the importance of foreign capital, asymmetric risk perception, high transaction costs and limited diversification as common financial sector features in Central and Eastern European countries (CEECs). The management of dynamic risks and procyclical market behavior require complementarity between price stability and financial stability, which means that prudential and administrative measures must support traditional monetary policy instruments.

In his keynote lecture "Catching Up: Financially Integrating Europe," Eric Berglöf (EBRD, Stockholm School of Economics) set out to analyze the challenges which CEECs face during the process of financial integration with Western Europe. Despite different starting points and different policies, there has been convergence in several areas: Banks clearly dominate the financial system, investments are financed through internal funds, external funds consist mostly of FDI, and the enforcement of laws and regulations is generally weak. Berglöf stressed that financial integration has lagged behind real integration and that a financial system which focuses on entrepreneurship and the promotion of the entry and exit of firms is needed. Thus further financial development and integration are crucial for future growth and depend on con-

tinued improvements of the institutional environment, in particular on the better enforcement of existing laws and regulations and stronger corporate governance. He suggested that new regional initiatives, so-called “club-in-club” initiatives, may help to strengthen the process of financial integration as well as financial development. Such initiatives, for example the Baltic financial zone, may trigger an EU-wide change. However, “club-in-club” initiatives should be seen as a complement to, not as a substitute for EU integration.

Philipp Hartmann (ECB) chaired session 1, “The European Financial System as an Economic Driving Force.” The first paper, “The Financial System of the EU-25” by Franklin Allen (University of Pennsylvania), Laura Bartiloro (Banca d’Italia) and Oskar Kowalewski (Academy of Entrepreneurship and Management), gave an overview of the financial structure of the enlarged European Union. Using a wide range of financial indicators, Kowalewski pointed out the substantial differences between the financial structures in the old and new Member States. He stressed that given the dominance of banks in the EU financial structure, there was a great need for more harmonization and adaptation of regulatory changes in banking. The authors identified the review of safety nets as a further challenge, as the responsibility of the home country in bailing out foreign branches could create serious problems if small home countries are unable to bail out large banks. In the second paper, “The Impact of the Euro on Investment: Sectoral Evidence,” Tomas Dvorak (Union College, Schenectady, New York) showed that the effect of the euro on investment growth was positive and in fact strongest immediately following its introduction in 1999. The effect appears to be equally strong for countries with high and low levels of financial developments, whereas the effect is stronger for industries that depend on external finance. Dvorak found no evidence that the introduction of the euro increased the efficiency of capital allocation, however. The last paper of this session, titled “Financial Integration and Entrepreneurial Activity: Evidence from Foreign Bank Entry in Emerging Markets” by Mariassunta Giannetti (Stockholm School of Economics) and Steven Ongena (Center, Tilburg University), studied the effects of foreign bank lending on firm growth and capital structure, distinguishing between small versus large firms and firms with state or banking “connections” versus those without, and the effects on the industrial structure. The authors found that foreign lending stimulates growth in firm sales, assets, and leverage, whereas the effect is dampened for small firms. They also pointed out that the most connected firms benefited least from foreign bank entry. Furthermore, the authors concluded that foreign banks can have an effect on the industrial structure by decreasing the presence of small firms and by increasing the exit and the entry of firms. Going beyond comments on the presented papers, the discussant, Luc Laeven (World Bank), argued that the primary functions of financial systems are very hard, if not impossible, to measure. Existing financial sector indicators are good in measuring the size of the financial sector but less appropriate for measuring the functioning of the financial market, e.g. efficiency and quality, and the institutional environment.

Session 2, chaired by Doris Ritzberger-Grünwald (OeNB), investigated the question whether high credit growth in Central and Eastern European Countries was a matter of concern. The three presentations in the session

treated the topic from different angles, as pointed out by the discussant Dubravko Mihajek (Bank for International Settlements, BIS). Frédéric Boissay (ECB) and his coauthors (Oscar Calvo-Gonzalez, ECB, and Tomasz Kozluk, European University Institute) argued in their paper “Is Lending in Central and Eastern Europe Developing too Fast?” that credit growth was too fast in most of the CEECs covered in their sample, taking into account the fundamentals as well as catching-up effects. This was found to be especially true for countries with currency boards or tightly managed float systems. Andrea Schaechter, Christoph Duenwald and Nikolay Gueorguiev from the IMF focused on credit booms and policy responses in Bulgaria, Romania and Ukraine (“Too Much of a Good Thing? Credit Booms in Transition Economies: The Cases of Bulgaria, Romania and Ukraine”). They concluded that credit growth has supported strong economic performance but has also contributed to macroeconomic imbalances in Bulgaria and Romania and has raised prudential concerns in Ukraine. Deborah Revoltella (UniCredit Group) and Fabrizio Coricelli (University of Siena) presented the main results of the research project “The New Europe Household Lending Market” (coauthored by Andrea Moneta, Annalisa Aleati, Matteo Consalvi and Fabio Mucci, all from UniCredit Group) on the sustainability and the growth effects of the retail lending boom. Fast lending growth in the “New Europe” is driven by the mortgage market and an increasing role of households in banks’ lending portfolios. The high correlation between consumption and credit growth is considered to be an indication that retail lending markets are not yet promoting consumption smoothing. Nevertheless, the credit boom is not seen as leading to major imbalances. In his discussion, Dubravko Mihajek noted that the short credit market history and structural changes in credit demand in CEE countries complicate the assessment if credit growth is excessive. He also regarded a more disaggregated approach in assessing the impact of strong credit growth on the trade balance as necessary. The discussant warned against being too relaxed with respect to household lending and pointed out rising foreign debt, household indebtedness and property prices, and increased vulnerability to interest and exchange rate movements as negative side effects.

The dinner speech on the first day was delivered by Gertrude Tumpel-Gugerell, Member of the Executive Board of the ECB. In her lecture, Tumpel-Gugerell took a look at the history of financial development and integration in the EU over the past 15 years, focusing on whether past expectations have come true. She pointed out that both the “old” and the “new” Member States and candidate countries have gone through significant transformation processes and have been converging toward what has become a relatively similar financial system (mostly bank-based with large consolidated banks concentrating mainly on domestic markets, although in the case of the CEECs with a high share of foreign ownership). Notwithstanding these developments, both old and new Member States need to make further progress toward financial integration. This refers particularly to retail markets, market infrastructure, supervisory practices and aspects relating to the legal framework. Tumpel-Gugerell referred to challenges that stem from the rapid liberalization of the financial system, the high degree of foreign ownership of financial institutions, and the increasing share of foreign currencies in domestic lending activity in

some countries. With respect to the role of authorities in promoting financial integration, Tumpel-Gugerell stressed that the legislative framework favorable to the creation of a single market for financial services in the EU was now basically in place. Remaining challenges relate to the elimination of the last obstacles to financial integration by creating conditions that foster and guarantee the fair, homogeneous and transparent application of the rules for all market participants across the EU.

The second day of the conference started with a keynote lecture by René Stulz (Ohio State University), who started off by pointing out that in contrast to the neoclassical theory prediction, empirical evidence suggests that capital flows from emerging to developed markets. In his lecture, Stulz argued that this phenomenon was related to agency problems present in emerging markets both at the level of firms and countries where either corporate insiders or state rulers consume the private benefits that would otherwise accrue to the providers of capital. These agency problems lead to more concentrated ownership structures and also reduce the gains from financial integration. The examination of various indicators on governance at the firm and country level, data on ownership concentration, stock markets capitalization and the international diversification of (U.S.) portfolio investors produced evidence that corroborates the role of agency problems for ownership concentration and a lower degree of financial integration. René Stulz concluded with a plea for economic reform; improvements in governance would make it possible for Eastern Europe to benefit more from financial globalization.

Session 3a “Financial Sector Developments and Growth in Accession Countries and South-Eastern Europe,” chaired by Peter Mooslechner (OeNB), dealt with the question of how the development of financial markets might promote economic growth. In their paper “Importance of Financial Sectors for Growth in Accession Countries,” Gerhard Fink (Vienna University of Economics and Business Administration), Peter R. Haiss (Bank Austria Creditanstalt and Vienna University of Economics and Business Administration) and Goran Vukšić (Institute of Public Finance, Zagreb) analyzed this issue for eight CEECs and Malta. In their study, the authors regressed GDP growth on capital stock growth, the change in participation, the quality of human capital and different measures of financial intermediation. Although the results indicated that aggregate measures of financial intermediation usually enhance economic growth, only domestic credit to GDP and bond market capitalization were found to lead to higher economic growth, whereas private credit and stock market capitalization appeared to have no significant effect on growth. The second paper of the session, “The Finance-Growth Nexus and Financial Sector Environment: New Evidence from South-Eastern Europe,” by Arnaud Mehl (ECB), Cristina Vespro (ECARES, Université Libre de Bruxelles) and Adalbert Winkler (ECB) studied the determinants of the growth rate of GDP per capita for eight Southeastern European countries. Using a different set of explanatory variables (e.g. initial GDP, secondary school enrollment, government expenditure, openness, inflation) and pooled OLS estimations, the authors showed that it is not necessarily the degree of financial intermediation which matters for growth, but rather the quality of the financial sector (measured by means of foreign bank penetration, creditor rights and diverse EBRD

structural indicators). In the discussion, Sumru Altug (University of Koç) emphasized that the causality running from financial intermediation to economic growth should be considered with caution, as economic growth may also trigger substantial changes in the financial system (complex financial structures, financial innovations).

Session 3b, “Ownership Structure and Firms’ Performance”, chaired by Jan Krahnert (University of Frankfurt and Center for Financial Studies), provided an overview of the ownership structures and their consequences for companies’ investment performance in CEE. The first paper, “Ownership Structures and Investment Performance in Central and Eastern Europe” by Evgeni Peev and Dennis C. Mueller of the University of Vienna, compared the investment performances of selected CEECs and “old” EU countries. The authors found that foreign-owned companies had a relatively better investment performance, but their return on investment (ROI) was still less than their cost of capital. Furthermore, the overall effect of financial owners on investments was negative, as companies with nonbank financial institutions as shareholders generally showed a lower ROI; companies with bank owners had a higher ROI. In the second paper, “Ownership Competition in the European Transition Area: Towards a Viable Restructuring?” by Diana Pop (Laboratoire d’Economie d’Orléans) and Julien Le Maux (University of Paris I Sorbonne), the authors compared the impact of ownership concentration on economic performance in Romania and Croatia. The main finding of their paper was that in Croatia companies fare better if they have many large shareholders comparable in size, while Romanian companies perform better if the holdings of the largest shareholder are large relative to those of the other shareholders. The discussant, Zsuzsanna Fluck of Michigan State University, argued that banks offer comparably better monitoring, which might be a reason for their good investment performance, as suggested by the first paper. Commenting on the different effects of the shareholder structure on company performance in Romania and Croatia, Zsuzsanna Fluck argued that the different legal system might be an explanation.

Session 4a “Banking and Financial Stability,” chaired by Andreas Ittner (OeNB), focused on regulatory aspects of the banking system. The first paper, “Does Interbank Borrowing Reduce Bank Risk?” by Valeriya Dinger and Jürgen von Hagen of the University of Bonn, analyzed the extent to which interbank borrowing helps strengthen bank supervision. In their theoretical model, the authors postulate that interbank monitoring relating to interbank borrowing imposes discipline on small banks, which are dependent on interbank borrowing, and this complements traditional bank supervision. Using data for ten CEECs, the authors show that small banks indeed finance themselves on the interbank market, and they also tend to finance less risky projects than other banks do, confirming the predictions of the model. In the second paper, “Deposit Interest Rates, Asset Risk and Bank Failure in Croatia,” Evan Kraft and Tomislav Galac of Hrvatska narodna banka investigated how deposit rates, asset risk and bank failure were interrelated in Croatia during the last ten years. Using panel logit models, the authors tried to pin down the factors which could best predict bank failure in Croatia. Deposit rates were found to be very good at predicting bank failure, as risky banks tended to finance them-

selves from the retail deposit market. The third paper of the session, “Investigating the Early Signals of Banking Sector Vulnerabilities in Central and East European Emerging Markets” by Kardi Männasoo (Eesti Pank) and David G. Mayes (Suomen Pankki – Finlands Bank), took a wider approach in assessing the determinants of banking crisis in CEE. On the basis of logit models for a large bank-level dataset for the ten NMS and a number of countries from Southeastern Europe, the authors showed that macroeconomic variables tend to predict banking crisis well ahead of other variables. However, they additionally showed that these other indicators of the financial and banking system and of individual banks are of help in forecasting banking crisis at shorter time horizons. In the discussion of the papers, Helmut Elsinger (University of Vienna) suggested that some of the assumptions of the theoretical model of Dinger and von Hagen may be too unrealistic. He also noted that the risk measures used in the empirical part of the paper may be sensitive to untruthful accounting potentially practiced by unscrupulous banks. Regarding the last paper, Elsinger noted that it was bad news that only macroeconomic variables predict banking failure two years ahead well, which made it impossible to distinguish between individual banks on the basis of bank-level characteristics.

Session 4b, “Financial Integration of New EU Member States,” was chaired by Max Watson (Economic Advisor to the European Commission). The first paper, “Financial Convergence and Integration of New EU Member States” by Lorenzo Cappiello (ECB), coauthored by Bruno Gérard (CentER, Tilburg University and Norwegian School of Management), Arjan Kadareja (ECB) and Simone Manganelli (ECB), analyzed the degree of integration of stock and bond markets of the NMS with those of the euro area. Using two different econometric methodologies, the authors found that the degree of equity market integration has increased during the process of EU accession, especially in the larger NMS. By contrast, the authors did not find evidence for increased bond market integration. The second paper, “The Integration of Czech, Hungarian and Polish Bond Markets with the Euro Area Bond Market” by Thomas Reininger and Zoltan Walko of the OeNB, studied the integration of bond markets in the Czech Republic, Hungary and Poland with the euro area, benchmarking it to the experience of peripheral euro area countries during the run-up to euro adoption. The authors found that only the Czech bond market showed a considerable level of integration with the euro area on the basis of convergence in yield changes, comparable to that in the peripheral euro area countries two years prior to euro adoption, despite considerable convergence on the basis of yield levels. Discussing these results, the authors noted that while the lack of integration has some benefits at the current stage in the monetary integration process of these countries, stronger bond market integration is likely to become necessary at later stages. In the third paper, titled “International Capital Mobility and Current Account Targeting in Central and Eastern European Countries,” Matthias Köhler (Center for European Economic Research) measured financial market integration in the five Central European NMS using the Feldstein-Horioka approach in analyzing the relationship between domestic savings and investment rates, and using unit root tests for the current account. Using the first approach, the author did not find firm evidence that these countries had pursued active current account targeting poli-

cies in the past. However, using the second approach, he came to the conclusion that countries with severe current account problems seem to have actively used policies to achieve a better balance. In his comments on the first paper, Lieven Baele (Tilburg University and CentER) suggested some improvements and fine-tuning in the econometric methodology used by the authors, and also suggested additional factors which may explain the time variation in equity market correlation. Regarding the second paper, Baele pointed out that the interpretation of the integration parameters can be complicated by the existence of exchange rate risk, and also suggested some modifications to the applied methodology. Turning to the last paper, Baele focused on the possibility of an omitted variable bias in the analysis and pointed out that savings and investment rates may be correlated because they are driven by a third factor.

In Session 5a, “The Effects of Foreign Bank Entry” (chaired by Adalbert Winkler, ECB), Christa Hainz (University of Munich) presented the first paper, “Modes of Foreign Bank Entry and the Effects on Bank Interest Rates: Theory and Evidence,” (co-authored by Sophie Claeys, Ghent University). The paper studied the effect of different entry modes on the interest rate for loans in a model where domestic banks possess private information about their incumbent clients but foreign banks have better screening skills. The model predicts that interest rate spreads are higher if credit institutions enter through acquisition rather than greenfield investment. The result is empirically validated for a large sample of banks within ten CEE transition countries for the period from 1995 to 2003. The second paper, “Profitability of Foreign and Domestic Banks in Central and Eastern Europe: Does the Mode of Entry Matter?,” by Olena Havrylchyk (CEPII) and Emilia Jurzyk (Katholieke Universiteit, Leuven) showed that foreign banks, especially greenfield institutions, earn higher profits than domestic banks. The profits of foreign banks in the CEECs also exceed the profits of their parent banks, which explains why banks enter the CEEC market. Further, the authors examined the costs and benefits of foreign ownership by analyzing the determinants of profitability for domestic, takeover, and greenfield credit institutions. The profits of foreign banks are found to be less affected by macroeconomic conditions in their host countries, but greenfield banks are sensitive to the situation at their parent banks. The last paper of the session, presented by Rajdeep Sengupta (Vanderbilt University, Nashville, Tennessee), modeled foreign entry and bank competition as the interaction between asymmetrically informed principals: The entrant uses collateral as a screening device to contest the incumbent’s informational advantage. The entrant’s success in gaining borrowers of higher quality by offering cheaper loans increases with its efficiency advantage. The paper accounts for evidence suggesting that foreign banks tend to lend more to large firms, thereby neglecting small and medium-sized enterprises. The results also seem to explain why this observed “bias” is stronger in emerging markets. In his discussion of the papers, Bo Becker (University of Illinois) emphasized that in assessing foreign bank entry it was necessary to go beyond focusing on profitability and to look into loan volumes and pricing as well. Referring to the Claeys and Hainz paper, he pointed out that information advantages of FDI through acquisition as opposed to FDI through greenfield investment should disappear with time. As regards the Havrylchyk and Jurzyk paper, Bo Becker

emphasized the lower profitability of acquired banks before acquisition, which lends support to the conclusion that foreign ownership causes rather than chooses high profitability. He further pointed out that in line with the studies and as a generally plausible argument, one would expect countries with better creditor protection to host more foreign banks. However, better creditor protection being the case in Western European countries, one – perhaps surprisingly – finds less foreign banks there than in the eastern part of the continent. Thus, Becker concluded that there may be some slack in the system that attracts foreign bank entry in Eastern Europe.

Jan Krahnert (Center for Financial Studies) chaired Session 5b, “Interbank Lending and Systemic Risk.” Zsuzsanna Fluck (Michigan State University) presented the paper “Race to the Top or Bottom? Corporate Governance, Freedom of Reincorporation and Competition in Law”, coauthored by Colin Mayer (Said Business School). The authors found that given the prevalent technology in a country and its optimal governance structure, manager control induces firms to reincorporate in the most manager-friendly location. When shareholders have full or partial control over the reincorporation decision, there will be a diversity of governance structures. Furthermore, regulatory competition induces regional separation of start-up and old firms, as there is no governance structure that maximizes the social welfare of existing and new enterprises. The paper by Falko Fecht (Deutsche Bundesbank) and Hans Peter Grüner (University of Mannheim), “Financial Integration and Systemic Risk,” addressed the question of the costs and benefits of regional financial integration in the interbank market. The authors show that the relationship between the costs and benefits of financial integration in the interbank market is determined by the relative likelihood of offsetting regional liquidity shocks versus aggregate shocks and the cost of asset liquidation in case of contagion. In her paper, “Contagion Risk in Financial Networks,” Ana Babus (Erasmus University) observed that modern banking systems are highly interconnected both on the liability and asset side, entailing the risk of contagion. Ana Babus addressed the question of whether the links that banks form are such that contagion risk is at a minimum. It is shown that when banks are connected in an incomplete network, the degree of interdependence that is created is likely to be suboptimal. Complete networks ensure that banks always set the interbank linkages at a level that minimizes contagion risk. In his discussion, Sylvain Champonnois (Princeton University) observed common topics in the three contributions; all examining possible hazards associated with financial integration. Those hazards are associated with systemic risk in the banking system and a possible race to the bottom in standards. Furthermore, the relationships between the agents in the models are endogenously derived from their maximization problems. He raised the issue of the importance of these integration hazards.

The closing panel discussion, “Financial Integration and Commercial Bank Strategies in the CEECs,” was chaired by Josef Christl, OeNB Executive Director. The panel consisted of a selected group of premier-league CEE financial market practitioners. Alessandro Profumo (UniCredit Group) expounded the “UniCredit strategy in Central and Eastern Europe.” He stressed the size of the CEEC markets, strong economic growth, and continuing strong growth potential, and named UniCredit “the undisputed banking leader in the region.”

The high degree of complexity of the region makes it necessary to integrate different banking models, to diversify strategic approaches for various countries and to make people with different languages and mentalities work together fruitfully. In just six years, UniCredit made a number of large acquisitions, bringing total UniCredit investment in these six years – excluding the HVB/BA-CA purchase – to around EUR 2.7 billion. László Wolf (OTP Bank) focused on “Increasing Shareholders’ Value – The OTP Story.” Shareholder value can be raised two ways – through operational improvements or through acquisitions. On the one hand, OTP built a centralized back office in 2003 to boost efficiency and strengthen branches’ sales focus, enabling OTP to save significant resources. On the other hand, in recent years OTP has expanded strongly abroad and has acquired credit institutions in Slovakia, Romania, Croatia, Ukraine, Bulgaria and Serbia, countries whose financial sector is growing faster than that of Hungary. Pointing to the most recent impressive performance of OTP shares, László Wolf emphasized the pertinence of swift and efficient transformation measures. Reinhard Ortner (Erste Bank) spoke about banking consolidation and touched upon some key issues in the global arena. According to Ortner, banking is currently in a phase of consolidation in the U.S.A., linked i.a. to economies of scale. Having a cash flow mountain for redeployment at their disposal, U.S. banks may leapfrog into Europe in the future. On the other hand, European banking consolidation will need to be founded on increasing acceptance of cross-border transactions. However, there are a number of barriers to intra-European consolidation, including domestic protectionism, the absence of a European takeover code and differing accounting approaches. The real problems often boil down to three simple issues: Who is the CEO? Where are the headquarters located? What is the name of the entity? Ortner also stressed that many large top-performing institutions have substantial exposure to high interest-margin consumer finance business. “Financial Integration and Commercial Bank Strategies” was the topic Frederik von Dewall (ING Bank) presented. He also took a global view, but concentrated more on the geographic aspect, i.e. on long-term market dynamics by regions. In his view, Central, Eastern and Southeastern Europe are among the promising regions for banks, but they have to compete with other promising areas such as China and India. Looking at banking, Frederik von Dewall pointed to the large catching-up potential of CEE with the euro area in terms of the degree of financial intermediation. Despite various impediments to EU cross-border mergers and acquisitions, the latter have recently reached a total deal value comparable to that of the U.S.A. Merger synergies mostly come from lower cost bases. The general discussion focused on the question which indicator – cost saving or revenue growth – is more important for successful bank performance. A consensus emerged that both were important, but that in the short term, cost-cutting effects, which were more easily perceived by markets, were probably preferable. In the long term, though, revenue expansion is indispensable for success.

In his closing remarks, Josef Christl appreciated the width and depth of the issues covered in the lectures and presentations held during the two days of the conference. Summarizing the highlights of the conference, Christl acknowledged the impressive transformation process which took place in Central and

Eastern Europe during the past decade. He pointed out, however, that despite the success achieved, the CEECs continue to lag behind Western Europe in terms of their financial development level. He added that differences exist among the CEECs as well. Christl stressed that to promote financial integration across Europe, there was a need for “better regulation,” drawing on open, transparent and evidence-based policymaking, and a need to focus on the consolidation and consistent implementation of the legislative framework for financial services. He underlined that further financial development in CEE could be expected to foster economic growth and thus support the economic catching-up process. Moreover, Josef Christl pointed out that this process must be carefully monitored to guarantee financial stability. He also referred to evidence presented at the conference that the integration of the capital markets in the NMS with that of the euro area remains limited. He expressed his belief that this situation would change over the next few years. Finally, Christl highlighted the significant role of commercial banks in promoting financial development integration in CEE. He noted that commercial banks in the region were well aware of the benefits and challenges of doing business in CEE. Finally, Christl pointed out that the banking industry’s natural self-interest in pursuing its business activities while keeping risks on a manageable scale would have to be complemented by adequate regulation and supervision practices, in particular in areas like the effective supervision of financial conglomerates and of the nonbank financial sector, and the supervision of cross-border financial institutions.

# The CEEC Website

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Silvia Kirova



## Selected Abstracts

The selected abstracts below alert readers to studies on CEEC topics in other OeNB publications. You may find the full-length contributions at [www.oenb.at](http://www.oenb.at).

### **Main Features of Recent Banking Sector Developments in Selected Southeastern European Countries**

Peter Backé,  
Thomas Reininger,  
Zoltan Walko

The purpose of this paper is to provide a comparative stock-taking exercise of recent banking sector developments in four current EU candidate countries (CC-4), namely the two acceding countries Bulgaria and Romania and the two negotiating candidates Croatia and Turkey. The paper finds that a strong increase in foreign liabilities allowed boosting domestic lending in particular to households. At the same time, banks' credit risk that results from non-banks' foreign exchange exposure has significantly increased. Although in recent years (1) banks' profitability has increased, (2) their share of nonperforming assets has declined and (3) their capital adequacy ratios can currently be considered as still sufficiently high (despite the recent domestic credit expansion), considerable risks to macroeconomic and macrofinancial stability may arise if foreign liabilities and domestic credit growth continue to increase at such a rapid pace in the future.

Published in Financial Stability Report 11.

### **High Employment with Low Productivity? The Service Sector as a Determinant of Economic Development**

Andreas Breitenfellner,  
Antje Hildebrandt

Whether measured in terms of employment or value added, the service sector dominates the economies of industrialized countries. The positive connection between tertiarization and per capita income is confirmed in both country cross-section and time series analyses. This development can be explained by demand factors (e.g. the growing proportion of female employees) and supply factors (e.g. cost disease in the service sector). This paper analyzes data on 23 service activities, grouped into four subsectors (distribution, business, social and personal services). The analysis of each subsector's contribution to the development of employment and productivity between 1983 and 2003 illuminates the prevailing productivity gap between the EU-15 and the U.S.A. The corresponding investigation of four new EU Member States during their transformation processes points to an employment potential in the tertiary sector that has not yet been fully utilized. The study further identifies four tertiarization models (dynamic, lagging, managed and catching-up) that can be associated with different geographic regions. The process of tertiarization is compatible with growth in both employment and productivity. Different combinations of production- and consumption-oriented services can have a positive effect on growth. The concluding chapter discusses the role of the European Union's Lisbon strategy in enhancing the productivity of the service sector.

## Oil Price Shock, Energy Prices and Inflation – A Comparison of Austria and the EU

The marked increase in the price of crude oil has also affected the prices of motor fuels, heating oil and other forms of energy. The extent and speed of these price reactions have varied widely in EU countries, and the accompanying inflationary effects have differed accordingly. For monetary and economic policy, it is important to know the channels through which oil price fluctuations are transmitted in order to assess their effects on inflation, economic growth and employment.

This study presents a current overview of oil and primary energy markets worldwide and estimates the elasticities and the speed of adjustment parameters of motor fuel and heating oil prices in response to oil price fluctuations in the EU-25. In addition, we test whether prices react asymmetrically to increases and decreases in crude oil prices and examine their transmission to other forms of energy, such as natural gas, electricity, solid fuels and district heating. We highlight the effect of volume-based excise taxes, which have a strong differentiating as well as dampening effect on prices, and address the issue of whether fiscal policy should cushion the impact of price increases, for example by lowering energy taxes or by providing energy subsidies. Then we quantify the direct inflationary effects of an oil price shock in Austria in a simple simulation using the OeNB's inflation forecasting model. Finally, we derive conclusions for monetary and economic policy.

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## Reform of the Stability and Growth Pact

The objective of the Stability and Growth Pact (SGP) is to secure sound fiscal policies, which have remained a national responsibility in Economic and Monetary Union (EMU). Ever since it first took effect, the SGP had been subject to a reform debate, ultimately leading to its redesign in 2005. The debate intensified in 2002, when several European countries suffered from growing budgetary problems, and culminated in November 2003, when the Ecofin Council decided not to act upon European Commission recommendations to move to the next steps of the excessive deficit procedure (EDP) for France and Germany and instead adopted conclusions putting the procedures in abeyance subject to certain undertakings by the countries concerned. Consequently, the Commission brought an action before the European Court of Justice. The conflict surrounding the correct procedure in line with the provisions of the Treaty establishing the European Community (the Treaty) and the SGP, i.e. the correct interpretation and implementation of the procedural and factual steps laid down therein, brought to light differences of opinion between the EU Member States and the Commission as well as among the Member States themselves.

Against this background, the European Commission presented concrete proposals to reform the SGP in the fall of 2004. At an extraordinary Ecofin meeting on March 20, 2005, the EU finance ministers reached a compromise on the reform of the SGP. The reform includes measures applicable to both the preventive and the corrective arms of the SGP. The top priority of the reform was to enhance Member States' national ownership of the fiscal framework

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and hence to safeguard the sustainability of public finances in EMU in the long run.

Experience to date does not allow for a final assessment, but from the vantage point of monetary policy, certain weaknesses remain that had already been pointed out during the reform debate.

Published in Monetary Policy & the Economy 1/06.

See also box 1, entitled “Economic Outlook for Central and Eastern European Countries,” in the Economic Analysis in Monetary Policy & the Economy 1/06.

# Transition and Economic Performance – Business Conditions in Eastern Europe

## **Presentation of the EBRD's Transition Report 2005**

As in the past years, the Oesterreichische Nationalbank hosted the presentation of the EBRD Transition Report in Vienna in 2005. The event, chaired by Peter Backé, Head of the Central and Eastern European Analysis Unit of the OeNB's Foreign Research Division, took place on December 9 as part of the OeNB's lecture series. The presentation comprised two modules. Samuel Fankhauser, Director of Policy Studies at EBRD, presented the Transition Report 2005, whereas Alexander Auböck, Country Director for the Czech Republic, Slovakia, Slovenia and Hungary, focused on EBRD's business projects, instruments and partners in transition economies from an operational perspective. He also stressed the growing shift of the EBRD's business in Central and Eastern Europe from providing credit to taking equity stakes.

Like its predecessors, the Transition Report 2005 covers Central European, Southeastern European, Eastern European and Central Asian countries and, in addition to detailed country analyses, is compounded of two thematic parts. The first part analyzes macroeconomic developments and in particular transition progress as measured by economic and institutional indicators. The second part of the report addresses a different transition issue every year and treats it in more detail. In 2005 the EBRD, in collaboration with the World Bank, for the third time conducted the Business Environment and Enterprise Performance Survey (BEEPS) of over 9,500 firms. The objective of the survey was to shed some light on the extent to which enterprises in transition economies believe obstacles such as weak regulation, corruption, red tape, labor market rigidities or a weak judiciary impair their performance and growth.

The report concludes that on the one hand especially Central Europe and the western Commonwealth of Independent States (CIS) made significant transition progress. In Central Europe, this was mainly a market reaction to improved regulation and progress in institution building related to EU membership. The entire region was distinguished by a dynamic economic performance associated with rapid credit growth in a number of countries.

The report also notes that on the other hand, although the business environment in all countries of the region has improved since the last survey in 2002, there are still some hindrances impeding business, in particular institutional weaknesses, red tape and difficulties in accessing external financing. It is noteworthy that these obstacles hit those companies hardest that can benefit the economy most.

## **Part I: Transition and Economic Performance**

Although the pace of economic growth in the region has slowed down somewhat, it is still projected to reach an impressive average of 5.3% in 2005, topping growth in most of the rest of the world, in particular the euro area. At 6.2%, the frontrunner is the CIS, where growth is driven primarily by surging commodity prices. Central Europe and the Baltic states (CEB) and Southeastern Europe (SEE) in turn recorded growth rates of 4.2% and 4.8%, respectively.

The EBRD employs a wide array of indicators by means of which transition progress is measured. Among CIS countries, particularly Armenia, Moldova, Ukraine and Georgia recorded progress. While no improvement could be observed in other CIS countries compared to 2004, Russia received both an upgrade (in the financial sector) and a downgrade (due to a rise in state ownership and control in the oil and gas sector), the only downgrade in the report. Among SEE countries, Serbia and Montenegro advanced most tangibly in the course of 2005. However, Serbia and Montenegro is a latecomer to transition and has a lot of catching up to do. In fact, Serbia and Montenegro is probably moving on at a slower pace than the CEB countries when they were at a comparable stage of transformation. The CEB countries received their upgrades in particular for the restructuring activities of firms and for reforms in the banking and the nonbank financial sector. Looking at the overall transformation progress, the CEB countries have retained their lead vis-à-vis the SEE and CIS countries and even managed to extend their edge somewhat.

The report also points out some important indicators of rising confidence in the region, such as foreign direct investment (FDI) and credit growth. FDI reached an unprecedented record high last year, and although it is still rather concentrated on specific regions (such as the CEB countries) as well as sectors (the majority of FDI in the CIS flowed to the oil and gas sector), the report suggests that the level of concentration has decreased. In addition, most transition countries witnessed a spectacular growth of credit, especially to households. While this can in general be perceived as a structural shift to deeper financial systems, it might also imply risks to macroeconomic and financial stability. On top of that, each country faces additional specific challenges, be it continuing high fiscal deficits in Poland, the Czech Republic, Hungary, Croatia or Albania, sizeable current account deficits in the Baltic states and a number of SEE countries, vulnerable financial sectors in Hungary (in macroprudential terms) and the CIS countries (in terms of the strength of financial systems) or the risk of “Dutch disease” in some CIS countries.

## **Part II: Business Conditions in Eastern Europe**

Although the business climate has not yet achieved the benchmark level of mature market economies, the region showed significant improvements and convergence toward the standards of advanced economies in all investigated categories. This holds true in particular for regulation, taxation and infrastructure. At the same time, the relatively less constrained labor market also seems to be converging to Western (continental) European patterns of e.g. shortages of skilled labor and regulation. Despite improvements, companies still point out painful shortcomings, such as institutional weaknesses, red tape and difficulties in accessing external financing. In the Czech Republic, Hungary and Azerbaijan, obstacles to business have even worsened since the last survey in 2002.

The survey also finds that obstacles most severely hinder those firms that are most likely to crank up growth or create new jobs. In addition, the benefits of reforms are spread out rather unevenly within countries, so that firms located outside capitals are still at a relative disadvantage. The report also documents that the market and ownership structure markedly affects the

firms' productivity and efficiency. Companies exposed to fierce competition (e.g. exporting firms) as well as foreign-owned firms experience faster productivity and efficiency growth.

The subsequent discussion centered among other things around the environmental standards of EBRD projects, the challenge for the region brought about by emerging China and the interest rates the EBRD charges compared to commercial banks. Overall, there was broad agreement that Eastern Europe is a dynamic and increasingly stable and attractive region. Despite further transition progress, however, there are still important challenges lying ahead for each country, particularly a poor judiciary, shallow financial markets, excessive bureaucracy, corruption and, in some cases, macroeconomic stability issues which will need to be tackled.

## *Growth, Poverty and Inequality in Eastern Europe and the Former Soviet Union*

### **Presentation of the 2005 World Bank Report**

On November 3, 2005, the Oesterreichische Nationalbank became the venue for the presentation of the World Bank's report on "Poverty and Inequality in Eastern Europe and the Former Soviet Union." The study is an update of the bank's analysis on poverty ("Making Transition Work for Everyone," released in 2000). It focuses on the impact of economic growth on poverty and inequality in the region between 1998 and 2003. The report was presented by Ruslan Yemtsov, Senior Economist and Regional Poverty Coordinator of the World Bank's Poverty Reduction and Economic Management Group in the Europe and Central Asia Region, in a session chaired by Peter Backé, Head of the OeNB's Central and Eastern European Analysis Unit. In his presentation, Yemtsov addressed three main questions:

What were the trends in poverty and inequality over the period under review? Why are the outcomes different across countries? And what can public policy do to promote poverty reduction in the future?

The bottom line of the study is that some 40% of previously poor people in Central, Eastern and Southeastern Europe as well as in the Commonwealth of Independent States (CIS) were pulled out of poverty between 1998 and 2003 as a result of strong economic growth. This is clear-cut evidence for the vital importance of growth for welfare and living standards.

The authors employ household consumption data to establish an indicator that makes living standards comparable across the 26 countries covered in the report. Poverty is measured by comparing data on household consumption per capita and defining an absolute poverty line of USD 2.15 per day (in terms of purchasing power parity in 2000). This poverty line definition, which is higher than the usual standard of USD 1 per day, is justified given that expenditures on heating and warm clothing are higher in the region's cold climate. Between 1998 and 2003, more than 40 million people moved out of poverty, which reduced the share of poor people from roughly 20% to 12%. However, sadly enough, over 60 million people still remained below the poverty line. In addition, another 153 million people are deemed economically vulnerable, subsisting on USD 4.30 or less a day. In other words, those people who are not considered poor at the moment could fall below the absolute poverty line in the event of a pronounced economic slowdown.

The distribution of poverty is not uniform across the region. It can be subdivided into four rather homogeneous groups of countries. In the eight new EU countries covered by the report (EU-8), poverty is low at less than 5% and is limited to specific population groups (e.g. the Roma). In the Southeastern European Countries (SEECs) and the middle-income CIS countries, the share of poor people is relatively small, as it does not exceed 20%. The situation in low-income CIS countries is dramatically different: more than 40% of the population has to get by on USD 2.15 or less a day (except in Azerbaijan). The study also covers Turkey and two countries outside the region, middle-income Colombia and low-income Vietnam, as a benchmark against the postsocialist countries.

The good news is that poverty almost halved over the period under review in response to the strong economic growth of the entire region, which was substantially higher than the world average. Moreover, while poverty declined in almost all surveyed countries (except in Poland, Lithuania and Georgia), the reduction was strongest in the populous middle-income CIS countries. Poverty declined fastest in capital cities, as opposed to other cities and rural areas.

Strong economic growth is the single most powerful force behind the significant poverty reduction in the CIS, where the number of poor people is largest. The reduction in consumption inequality (mainly in the CIS) is another crucial factor that contributed to the sharp poverty decline in the period under review: it declined everywhere in the CIS apart from Georgia and Tajikistan. No clear inequality trend could be observed in the EU-8 and in the SEECs. According to the study, by 2003 consumption inequality in the region was comparable to that in relatively egalitarian regions such as East Asia or in some of the world's rich countries. However, large regional inequalities continue to exist, both between and within countries. In spite – or rather because – of this positive news, the report issues a warning. Since the reduction in poverty resulted from a unique constellation of factors – rapid “catching up” growth in the CIS accompanied by reductions in inequality in some countries – prospects for a further reduction are less promising.

Economic growth can reduce poverty via three distinct channels – wage, employment and social transfers; the wage channel was by far the strongest and the most unambiguous in all subregions. While the working poor profited from real wage growth, the unemployed poor benefited to a much smaller extent, as growth in general failed to create more jobs than had been destroyed. The only exceptions were some rapidly growing CIS countries, such as Kazakhstan, Russia and Ukraine, where the employment rate increased substantially. In the EU-8 and in the SEECs, however, the ratio of employment to the working-age population is well below that of OECD countries and also well below the Lisbon target of 70%. Moreover, it trends in the wrong direction in many countries. On the one hand, the study warns emphatically that if this failure to expand employment persists, it will fundamentally limit the impact of economic growth on poverty reduction. This holds true even for countries in which poverty is relatively low: in Poland, for instance, poverty is rising in consequence of the growing divide between the employed and the unemployed. On the other hand, rising public transfers combined with higher coverage as well as some targeted social assistance programs helped reduce poverty. Social spending increased very strongly in real terms particularly in the SEECs and middle-income CIS countries. Still, most transferred resources were used to raise pensions rather than to support programs targeted at poverty reduction.

As poverty is not limited to the income dimension, the study also focuses on its nonincome components, such as access to education, heating, health care and potable water. The findings on these fronts are, however, rather mixed. While access to education has improved in general, the standards in several countries in all subregions are declining. In particular, the disparities in the quality of education have increased between the rich and the poor as well as between rural and urban areas. With respect to health care, the grow-

ing HIV/AIDS and also tuberculosis infection rates are the most pressing issues in the region. In some countries, in particular in the CIS and in SEE, the health care system has deteriorated to such an extent that it fails to provide adequate and timely health services. These facts notwithstanding, it would be possible to reverse the trend of declining life expectancy. Access to some key infrastructure services, primarily lighting and heating, has worsened in some countries of the low-income CIS group.

Unless economic growth accelerates, the report projects that 40 million people will remain poor and a further 110 million will continue to be economically vulnerable in 2007. Economic vulnerability and wide social and regional disparities are thus still the key concerns and challenges for the region. To end poverty by 2015, the World Bank urges all countries to focus on policies that will accelerate growth and to ensure that benefits are widely shared among the population. In particular, the authors call for a promotion of enterprise reform to encourage the shift of resources to more productive new firms. They recommend adopting policy measures that boost growth and productivity in agriculture and enhancing efforts to generate better opportunities for people living in lagging regions. In addition, the authors underscore the importance of improving the quality, accessibility and affordability of basic social services and of the social safety net. They also emphasize the significance of monitoring progress on poverty reduction.

The ensuing discussion focused on a variety of issues, inter alia on the effectiveness of anti-poverty measures as implemented by the international financial institutions and on the poverty effects of macroeconomic stabilization and structural reform programs. Moreover, the audience felt that the reduction in poverty witnessed in Central and Eastern Europe in recent years may have largely been a one-off development and that a further reduction in poverty in the region would be more difficult to achieve and would thus constitute a long-term challenge. The audience suggested two analytical topics for further examination: first, the impact of the current tax reforms on the distribution and elasticity of poverty, as well as its outcomes, and second, the need to better understand the link between ongoing public sector reforms (in the field of public administration, communal services, health care and education, specifically decentralization) and distributional and poverty consequences.

# The “East Jour Fixe” of the Oesterreichische Nationalbank

## 56<sup>th</sup> East Jour Fixe

### **Ukraine: Shifting Economic Horizons and Interlinkages**

The 56<sup>th</sup> East Jour Fixe of the Oesterreichische Nationalbank (OeNB) focused on Ukraine, a country so far only sparingly dealt with at events of this kind and which, in many respects, still remains quite exotic for economists although, over the last one and a half years, it has repeatedly been in the headlines of the political and economic media. Entitled “Ukraine: Shifting Economic Horizons and Interlinkages,” the 56<sup>th</sup> East Jour Fixe served to underline the OeNB’s dedication to focusing on a country that is actually not very far away from Vienna and in which Austrian banks have most recently strengthened their activities, with one Austrian credit institution even having acquired a key position in the Ukrainian market. As Doris Ritzberger-Grünwald, Head of the OeNB’s Foreign Research Division, pointed out in her introductory statement, Ukraine – being one of the largest countries of Europe and having become a direct neighbor of the European Union upon the enlargement of May 1, 2004 – exhibited impressive economic growth after the turn of the millennium. Most recently this uptrend, however, was followed by a more moderate performance. In this context, it would seem inappropriate to try to fully disentangle economic and political analysis.

The first session, presided by Ms. Ritzberger-Grünwald, was entitled “Ukraine – A New Economic Factor between Russia and the EU.” The first speaker, Clinton Shiells, Deputy Director of the Joint Vienna Institute (JVI), presented an econometric study co-authored with Marco Pani and Etibar Jafarov (both IMF). The paper deals with the question, “Is Russia Still Driving Regional – including Ukrainian – Economic Growth?” The authors examine the correlation of real economic growth between Russia and other CIS economies and the Baltic countries in the period from 1993 to 2004. While conceding the difficult nature of the exercise in view of limited data quality, Shiells showed that up to the Russian financial and economic crisis of 1998, a 1% growth increase in Russia tended to be associated with a 0.8% to 0.9% expansion in other CIS and Baltic countries. After the crisis, the correlation essentially went down to near zero, leading to the conclusion that the growth link has indeed broken down. However, Shiells also gave an alternative explanation, namely that transition effects reduced output in the countries observed during the period from 1993 to 1998, resulting in a high correlation, while countries recovered at different growth rates after that period. (For instance, Ukraine’s rebound only started a year after Russia’s.) The EU – despite enlargement – is not found to have “taken up Russia’s place.”

Vladimir Dubrovskiy, Member of the Supervisory Board and Leading Expert of CASE Ukraine, Kiev, presented a politico-economic analysis entitled “Ukraine One Year after the Orange Revolution: Economic Policy Challenges and Goals.” He started out with an overview of those components that were essential for the functioning of Ukraine’s society and economy before the change of government at end-2004. As opposed to profit-seeking, the Ukrainian society was predominantly rent-seeking. A hierarchy of authoritarian arbiters under the lead of the president was needed to regulate the appropriation of

rents. The wielding of this role required highly discretionary power (“vlast”) that contributed to weakening formally existing property rights and the rule of law in general, thus eroding social wealth. This environment was conducive to the emergence of informal networks and business administrative groups, led by “oligarchs,” who were the clients of the above-mentioned arbiters. According to Dubrovskiy, the partial depletion of the sources of rents, coupled with rising popular dissatisfaction with rampant corruption, contributed to triggering the “Orange Revolution.” However, although the Ukrainian people have become the principals of politicians, and despite some progress, a level playing field has not yet been achieved. Lacking the experience of democratic principles and of a competitive market economy, Ukrainians are still prone to egalitarianism, populism and paternalism – a fact that has partly been reflected in the policies and problems of the new government, as Dubrovskiy put it.

The two presentations were commented by William Tompson, Senior Economist at the OECD’s Economics Department in Paris. With respect to the first presentation, Tompson did not see the break in the growth linkage between Russia and other CIS countries to be so abrupt in 1998. In the discussant’s view, the weakening of the correlation may actually be linked to the effects of the disintegration of the USSR and, more generally, to the transition process. He added that Shiells’ alternative explanation was persuading. Regarding the second paper, Tompson doubted whether the Orange Revolution had really constituted a “revolution” in the sense that the arbiter-client relationship was now gone. Not surprisingly, the general discussion focused on a variety of topics, including the size of Russian FDI in Ukraine (judged to be generally underestimated in official statistics) and medium-term perspectives for Ukraine’s foreign trade orientation (West or East?). In response to questions, Dubrovskiy conceded that institutions were changing only slowly, but that a Ukrainian civil society, albeit weak, existed now. Thus, the democratic institutions that had existed formally in the period before the revolution could now start working. In his view, this can be considered a revolutionary change in the actual rules. Hopefully, Ukraine’s attempt at approaching the EU as fast as possible will create a framework for coping with populism, Dubrovskiy added. Shiells reiterated that the paper provides evidence of a structural break in 1998, but agreed that the process may be linked to the fact that transition countries were going their own way.

The second session, “Ukraine’s Financial Market and Austrian Banks’ Involvement,” was chaired by Peter Backé, Head of the Central and Eastern European Analysis Unit in the OeNB’s Foreign Research Division. The two speakers were Stephan Barisitz, economist with the Foreign Research Division, and Walter Demel, economist at Raiffeisen Zentralbank (RZB). Barisitz presented an overview of developments in the Ukrainian banking sector since the year 2000. He outlined an impressively swift, but fragile expansion of banking activities in recent years. Thus, the degree of financial intermediation (measured in terms of the ratio of bank assets to GDP) rose from under 20% in 1999 to 46% in the first half of 2005 (which is still a comparatively modest level, though). According to Barisitz, despite efforts at improving legislation and supervision, structural weaknesses continue to linger (banks’ inadequate risk management, insider lending, nonperforming loans, feeble creditor and

property rights). Political instability and the tumultuous change of government at end-2004 combined with weak confidence in the sector triggered a mini-banking panic, which was, however, quickly overcome in early 2005. Despite – or perhaps because of – this challenging situation, foreign strategic investors started to move into Ukraine in the second half of 2005, carrying out large acquisitions, with the RZB claiming the first-mover advantage.

Referring to this experience, Demel acquainted the floor with interesting aspects of Raiffeisen International’s purchase of the second-largest Ukrainian bank in his presentation “Bank Aval – A Unique Consolidation Opportunity.” Against the backdrop of the generous catching-up potential for banking services (particularly retail products) in Ukraine, Raiffeisen International paid USD 1.03 billion (ca. EUR 850 million) in October 2005 for a stake of 93.5% in one of the major Ukrainian retail banks, which has one of the largest branch networks in the country. Raiffeisen International had already been present in Ukraine with a subsidiary (Raiffeisen Bank); the planned merger between Raiffeisen Bank and Bank Aval should make Raiffeisen the country’s largest bank (in terms of assets). As Demel pointed out, Bank Aval had been classified “Best Bank of Ukraine” by the magazine “Euromoney” in 2003 and – like Raiffeisen Bank – has been among the banks enjoying the highest confidence levels.

The discussant of the second session, Peter Havlik, wiiw Deputy Director, asked the panelists what they thought of the likely future development of the Ukrainian banking sector: Will it remain basically domestically owned, like in today’s Russia, or will it evolve toward being predominately foreign-owned, as it happened (and is partly still happening) in most new EU Member States and candidate countries? On another – highly topical – issue, Havlik asked Dubrovskiy how he judged the recent price hike for Russian gas deliveries to Ukraine. Both Barisitz and Demel answered that there were indications that foreigners would make more inroads into Ukrainian banking, but that further developments would be influenced by policies and reforms chosen with a mid-term perspective and that these depended on upcoming elections and other factors. Dubrovskiy replied that Russia was certainly not satisfied with the geopolitical situation that had evolved since the Orange Revolution. Tompson added that while Russia had certainly handled the gas crisis badly, as far as he knew, Russia had not actually provoked the crisis. Ukraine had previously been sending out unclear signals in various areas of bilateral relations, including the Common Economic Space (CES) negotiated between Russia, Ukraine, Belarus and Kazakhstan. A lively general discussion ensued, which once again reflected the wide range and considerable weight of important issues Ukraine is currently facing.

## *Olga Radzyner Award for Scientific Work on European Integration*

The Oesterreichische Nationalbank has established an award to commemorate Olga Radzyner, former Head of the Foreign Research Division, who died in a tragic accident in August 1999. The award is bestowed on young economists for excellent research focused on topics of European economic integration and is conferred annually. This year, three applicants are eligible to receive a single payment of EUR 3,000 each from an annual total of EUR 9,000.

The submitted work shall be in the form of a master's or doctoral thesis, a working paper or a scientific article, and shall be in English or in German. Authors shall submit the work before their 35<sup>th</sup> birthday and shall be citizens of any of the following countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, the FYR of Macedonia, Hungary, Latvia, Lithuania, Poland, Romania, Serbia and Montenegro, Slovakia or Slovenia.

To identify their work as a submission, applicants shall mark the envelope with the reference "Olga Radzyner Award" and send it to the Oesterreichische Nationalbank, Foreign Research Division, Otto-Wagner-Platz 3, PO Box 61, AT 1011 Vienna. The Oesterreichische Nationalbank shall receive the work submitted for the award in 2006 by October 2, 2006, at the latest.

For detailed information, please visit our website at <http://ceec.oenb.at> or contact Ms. Sonja Pierron in the Foreign Research Division of the Oesterreichische Nationalbank either by e-mail ([sonja.pierron@oenb.at](mailto:sonja.pierron@oenb.at)) or by phone (+43-1-40420-5205).

# STATISTICAL ANNEX

# Statistical Annex

Table A1

<b>Gross Domestic Product</b>									
Annual real change in %	2003	2004	2005	2004 Q3	2004 Q4	2005 Q1	2005 Q2	2005 Q3	2005 Q4
Albania	5.7	5.9	5.5	x	x	x	x	x	x
Bosnia and Herzegovina	4.4	6.2	5.0	x	x	x	x	x	x
Bulgaria	4.5	5.7	5.5	6.2	6.3	5.9	6.5	4.6	5.5
Croatia	5.3	3.8	4.3	3.6	3.6	1.8	5.1	5.2	4.8
FYR Macedonia <sup>1</sup>	2.8	4.1	3.6	x	x	x	x	x	x
Romania	5.2	8.4	4.1	9.7	9.5	6.0	4.5	2.4	4.3
Russia	7.4	7.2	6.4	7.2	6.8	5.0	5.7	6.6	7.9
Serbia and Montenegro	2.4	8.8	4.7	x	x	x	x	x	x
Turkey	5.8	8.9	7.4	5.3	6.3	6.6	5.5	7.7	9.5
Ukraine	9.6	12.1	2.6	14.6	8.2	5.4	2.6	0.4	2.0

Source: Eurostat, wiiw, IWF, national sources.

<sup>1</sup> Former Yugoslav Republic of Macedonia.

Table A2

<b>Industrial Production</b>									
Annual real change in %	2003	2004	2005	Sep. 05	Oct. 05	Nov. 05	Dec. 05	Jan. 06	Feb. 06
Albania	2.7	3.1	..	x	x	x	x	x	x
Bosnia and Herzegovina	-7.8	9.0	5.1	9.7	0.3	11.7	5.1	16.1	7.9
Bulgaria	14.1	17.1	6.7	1.7	9.2	7.8	6.3	7.7	..
Croatia	4.1	3.7	5.1	6.0	7.2	6.4	3.1	5.9	..
FYR Macedonia	4.7	-2.2	7.0	x	x	x	x	x	x
Romania	3.2	5.4	2.2	2.7	1.7	1.6	2.2	4.2	..
Russia	7.0	7.4	4.0	5.1	3.8	6.1	5.0	4.3	1.0
Serbia and Montenegro	-2.7	7.5	..	x	x	x	x	x	x
Turkey	9.3	10.6	4.8	4.1	..	..	..	..	..
Ukraine	15.8	12.5	3.1	0.9	2.4	2.0	5.3	-2.9	1.5

Source: National sources, EBRD, wiiw.

Table A3

<b>Average Gross Wages</b>									
Annual nominal change in %	2003	2004	2005	Sep. 05	Oct. 05	Nov. 05	Dec. 05	Jan. 06	Feb. 06
Albania <sup>1</sup>	8.5	14.4	..	x	x	x	x	x	x
Bosnia and Herzegovina <sup>2</sup>	8.4	8.6	6.4	10.3	6.9	9.2	10.9	13.7	..
Bulgaria <sup>3</sup>	6.2	7.0	7.0	6.9	7.1	5.9	6.3	..	..
Croatia <sup>4</sup>	5.9	5.9	4.9	5.3	5.1	5.6	3.7	..	..
FYR Macedonia <sup>4</sup>	4.8	4.0	..	x	x	x	x	x	x
Romania <sup>4</sup>	25.4	22.5	23.7	23.8	22.2	23.9	23.3	14.2	..
Russia <sup>3</sup>	24.8	24.0	25.2	27.6	26.0	26.8	28.6	22.7	22.0
Serbia and Montenegro <sup>4</sup>	24.9	22.9	..	x	x	x	x	x	x
Turkey <sup>5</sup>	17.2	10.3	..	x	x	x	x	x	x
Ukraine <sup>3</sup>	23.0	27.7	36.5	35.7	38.6	39.2	44.9	35.0	35.7

Source: National sources, wiiw.

<sup>1</sup> Monthly earnings in the state sector.

<sup>2</sup> Excludes Brcko district wages.

<sup>3</sup> Total economy, gross.

<sup>4</sup> Total economy, net.

<sup>5</sup> Monthly manufacturing earnings.

Table A4

**Unemployment Rate**

End of period, %

	2003	2004	2005	Sep. 05	Oct. 05	Nov. 05	Dec. 05	Jan. 06	Feb. 06
Albania	15.0	14.4	..	x	x	x	x	x	x
Bosnia and Herzegovina	42.0	43.2	..	44.6	..	..	..	..	..
Bulgaria <sup>1</sup>	14.3	12.7	11.5	10.5	10.4	10.4	10.7	11.7	11.5
Croatia <sup>1</sup>	19.5	18.2	18.0	17.2	17.5	17.8	18.0	18.4	18.4
FYR Macedonia <sup>2</sup>	36.7	37.2	37.2	x	x	x	x	x	x
Romania <sup>1</sup>	7.6	6.8	5.8	5.5	5.7	5.7	5.9	6.2	..
Russia <sup>2</sup>	8.6	8.2	7.6	7.2	7.3	7.5	7.6	7.7	7.8
Serbia and Montenegro <sup>1</sup>	15.2	19.1	..	x	x	x	x	x	x
Turkey <sup>2</sup>	10.5	10.3	9.8	x	x	x	x	x	x
Ukraine <sup>2</sup>	9.1	8.6	7.0	x	x	x	x	x	x

Source: National sources, wiiv.

<sup>1</sup> Registered, period average.<sup>2</sup> Labor Force Survey, period average.

Table A5

**Industrial Producer Price Index**

Period average, annual change in %

	2003	2004	2005	Sep. 05	Oct. 05	Nov. 05	Dec. 05	Jan. 06	Feb. 06
Albania	6.7	12.4	..	x	x	x	x	x	x
Bosnia and Herzegovina	-0.1	2.3	-0.4	-0.3	-1.1	-0.8	-0.9	-0.8	-0.6
Bulgaria	5.0	5.9	7.1	7.0	6.3	7.6	11.2	10.2	..
Croatia	1.9	3.6	3.1	2.1	1.8	2.3	2.7	3.2	3.6
FYR Macedonia	-0.3	0.9	3.2	x	x	x	x	x	x
Romania	19.6	19.1	10.8	8.1	8.2	8.8	9.6	9.8	..
Russia	15.6	24.0	20.7	20.5	19.4	16.0	13.4	13.3	15.4
Serbia and Montenegro	-3.8	4.0	4.5	x	x	x	x	x	x
Turkey	25.6	14.6	6.0	4.4	2.6	1.6	2.7	5.1	5.3
Ukraine	7.8	20.4	16.8	14.7	12.9	10.4	9.6	10.7	8.1

Source: EBRD, wiiv, national sources.

Table A6

**Consumer Price Index**

Period average, annual change in %

	2003	2004	2005	Oct. 05	Nov. 05	Dec. 05	Jan. 06	Feb. 06	March 06
Albania	2.3	2.9	2.4	3.3	3.0	2.0	1.3	1.4	1.5
Bosnia and Herzegovina <sup>1</sup>	0.7	0.3	3.0	3.7	4.3	4.3	6.7	6.2	..
Bulgaria	2.3	6.1	5.0	6.5	6.9	6.4	6.5	8.8	8.7
Croatia <sup>2</sup>	1.8	2.1	3.4	4.1	3.8	3.6	3.9	3.6	3.0
FYR Macedonia <sup>1</sup>	2.4	0.9	2.1	x	x	x	x	x	x
Romania	15.3	11.9	9.1	8.2	8.7	8.7	9.0	8.6	8.5
Russia	13.6	11.0	12.5	11.7	11.2	10.9	10.7	11.2	10.7
Serbia and Montenegro	9.4	10.8	15.2	16.5	18.0	18.0	17.7	15.1	15.0
Turkey	25.6	10.1	8.1	7.5	7.4	7.1	7.6	7.6	7.5
Ukraine	5.2	9.0	13.5	12.4	12.0	10.3	9.8	10.7	..

Source: Eurostat, wiiv, national sources.

<sup>1</sup> Retail prices.<sup>2</sup> Retail prices until 2001.

Table A7

<b>Trade Balance</b>									
% of annual GDP									
	2003	2004	2005	2004 Q3	2004 Q4	2005 Q1	2005 Q2	2005 Q3	2005 Q4
Albania	x	x	x	x	x	x	x	x	x
Bosnia and Herzegovina	x	x	x	x	x	x	x	x	x
Bulgaria	-13.7	-15.1	-20.4	-9.5	-18.9	-15.7	-22.2	-19.5	-23.2
Croatia	-26.6	-23.7	-24.2	-20.6	-24.3	-23.1	-26.9	-21.5	-25.3
FYR Macedonia	x	x	x	x	x	x	x	x	x
Romania	-7.6	-8.7	-9.8	-6.9	-10.3	-7.7	-11.5	-7.8	-11.6
Russia	13.9	14.6	15.5	14.9	14.3	15.5	16.9	15.8	14.2
Serbia and Montenegro	x	x	x	x	x	x	x	x	x
Turkey	-5.7	-8.0	-9.1	-7.1	-7.7	-8.7	-10.5	-8.5	-8.7
Ukraine	-0.4	5.8	-1.6	4.0	2.4	6.6	-1.3	-4.8	-3.6

Source: National central banks.

Table A8

<b>Current Account Balance</b>									
% of annual GDP									
	2003	2004	2005	2004 Q3	2004 Q4	2005 Q1	2005 Q2	2005 Q3	2005 Q4
Albania	-8.2	-6.1	-7.2	x	x	x	x	x	x
Bosnia and Herzegovina	-21.8	24.7	-18.6	x	x	x	x	x	x
Bulgaria	-5.5	-5.8	-11.8	9.1	-15.1	-12.3	-11.3	-3.8	-19.9
Croatia	-7.1	-5.1	-6.3	25.1	-18.9	-22.7	-14.9	26.3	-19.5
FYR Macedonia	-3.5	-8.2	-6.5	x	x	x	x	x	x
Romania	-5.5	-8.4	-8.7	-6.2	-9.8	-6.2	-10.6	-6.1	-10.9
Russia	8.2	9.9	11.0	9.5	10.2	12.8	12.6	9.6	9.9
Serbia and Montenegro	-9.7	-13.1	-9.8	x	x	x	x	x	x
Turkey	-3.3	-5.2	-6.3	-0.7	-5.9	-8.7	-8.6	-2.4	-7.3
Ukraine	5.7	10.6	3.1	10.7	5.4	10.4	3.5	1.7	-0.4

Source: National central banks.

Table A9

<b>Net Foreign Direct Investment</b>									
% of annual GDP									
	2003	2004	2005	2004 Q3	2004 Q4	2005 Q1	2005 Q2	2005 Q3	2005 Q4
Albania	x	x	x	x	x	x	x	x	x
Bosnia and Herzegovina	x	x	x	x	x	x	x	x	x
Bulgaria	10.3	11.5	8.7	-8.1	26.3	8.4	7.3	10.9	7.7
Croatia	6.5	2.5	3.8	1.7	1.7	2.6	8.2	3.6	0.8
FYR Macedonia	x	x	x	x	x	x	x	x	x
Romania	3.1	8.4	6.6	7.4	6.3	3.5	5.7	5.2	9.9
Russia	-0.4	0.4	0.1	-1.4	2.0	1.8	1.8	1.7	-3.7
Serbia and Montenegro	x	x	x	x	x	x	x	x	x
Turkey	0.5	0.7	2.5	0.7	0.4	0.9	0.2	2.1	5.7
Ukraine	2.7	2.6	9.8	2.2	1.7	1.6	2.0	1.9	29.7

Source: National central banks.

Table A10

**Reserve Assets Excluding Gold**

End of period, % of annual GDP

	2003	2004	2005	2004 Q3	2004 Q4	2005 Q1	2005 Q2	2005 Q3	2005 Q4
Albania	x	x	x	x	x	x	x	x	x
Bosnia and Herzegovina	25.6	x	x	x	x	x	x	x	x
Bulgaria <sup>1</sup>	28.1	32.9	31.8	30.9	32.9	31.7	34.3	32.5	31.8
Croatia <sup>1</sup>	25.0	22.7	24.0	23.2	22.7	23.2	23.9	23.2	24.0
FYR Macedonia	x	x	x	x	x	x	x	x	x
Romania <sup>1</sup>	12.2	17.8	21.1	17.0	17.8	19.5	20.1	22.5	21.1
Russia <sup>1</sup>	15.3	18.7	24.1	16.8	18.7	20.8	23.4	22.9	24.1
Serbia and Montenegro	x	x	x	x	x	x	x	x	x
Turkey <sup>1</sup>	12.4	11.0	14.7	12.0	11.0	11.9	12.9	12.7	14.7
Ukraine	12.2	13.1	25.0	19.4	13.1	16.7	18.8	19.1	25.0

Source: IMF, wiiv.

<sup>1</sup> Quarterly data on the basis of rolling four-quarter GDP.

Table A11

**Gross External Debt**

End of period, % of annual GDP

	1999	2000	2001	2002	2003	2004	2005
Albania	32.3	31.8	29.3	26.3	24.7	22.0	..
Bosnia and Herzegovina	66.2	59.2	47.4	37.7	33.3	31.1	..
Bulgaria	89.2	86.7	78.3	64.9	60.0	64.2	67.7
Croatia	54.1	60.6	60.7	61.6	75.6	80.2	82.4
FYR Macedonia	40.6	41.5	43.9	43.4	42.4	44.8	..
Romania <sup>1</sup>	26.6	28.0	30.5	31.2	30.4	30.0	30.7
Russia	x	56.8	46.9	39.5	38.9	33.6	35.6
Serbia and Montenegro	61.8	164.0	103.5	76.4	69.7	62.4	..
Turkey	60.1	59.1	81.3	65.1	53.6	49.4	49.3
Ukraine	x	60.2	54.4	46.4	42.6	43.1	50.9

Source: National central banks, EBRD.

<sup>1</sup> Medium- and long-term debt.

Table A12

**General Government Balance**

% of GDP

	2003	2004	2005	2004 Q3	2004 Q4	2005 Q1	2005 Q2	2005 Q3	2005 Q4
Albania	-4.4	-5.0	-4.5	x	x	x	x	x	x
Bosnia and Herzegovina	-1.7	-1.9	-1.3	x	x	x	x	x	x
Bulgaria	0.0	1.7	2.3	3.9	-6.1	5.5	6.6	3.5	-4.7
Croatia <sup>1</sup>	-2.9	-4.3	-3.0	-3.5	-0.1	-12.1	-1.1	1.2	-1.5
FYR Macedonia	-1.0	0.1	0.4	x	x	x	x	x	x
Romania <sup>1</sup>	-1.5	-0.8	0.0	0.9	-1.4	-1.3	1.1	0.0	0.0
Russia <sup>1</sup>	1.7	4.3	7.5	5.1	2.9	11.9	8.3	3.8	7.1
Serbia and Montenegro	-3.4	-0.3	1.2	x	x	x	x	x	x
Turkey	-11.1	-7.0	-2.0	-4.9	-7.7	-3.2	-0.8	-2.9	-1.2
Ukraine	-0.2	-3.2	-1.9	-2.4	-9.2	3.6	-1.3	3.4	-12.2

Source: National sources, EBRD, wiiv.

<sup>1</sup> Central government balance.

Table A13

**Gross General Government Debt**

% of annual GDP

	1999	2000	2001	2002	2003	2004	2005	
Albania	72.7	71.3	66.8	64.8	60.6	55.6	..	..
Bosnia and Herzegovina	x	x	x	x	x	x	x	x
Bulgaria	79.3	73.6	66.2	54.0	46.3	38.8	33.9	33.9
Croatia <sup>1</sup>	x	x	x	x	41.5	44.2	45.2	45.2
FYR Macedonia	57.4	53.2	51.6	49.6	47.7	46.5	..	..
Romania	x	22.7	23.2	23.3	21.3	18.5	16.2	16.2
Russia	90.0	62.5	48.2	41.4	32.4	25.9	..	..
Serbia and Montenegro	x	x	x	x	x	x	x	x
Turkey	69.2	58.0	105.2	94.3	87.2	80.1	71.3	71.3
Ukraine	51.0	45.9	36.9	33.5	29.3	26.0	..	..

Source: Eurostat, EBRD.

<sup>1</sup> Central government debt.

Table A14

**Broad Money**

End of period, annual nominal change in %

	2003	2004	2005	Sep. 05	Oct. 05	Nov. 05	Dec. 05	Jan. 06	Feb. 06
Albania (M3)	7.6	13.1	14.0	16.1	16.1	14.3	14.0	12.9	11.6
Bosnia and Herzegovina (M2)	8.4	24.3	18.2	18.0	19.0	17.2	18.2	17.1	17.0
Bulgaria (M3)	19.6	23.1	23.9	26.6	27.0	27.3	23.9	20.1	..
Croatia (M4)	11.0	8.6	10.5	9.3	10.2	10.8	10.5	..	..
FYR Macedonia	18.0	17.0	..	x	x	x	x	x	x
Romania (M2)	23.3	39.9	33.9	41.3	41.3	43.1	33.9	35.8	x
Russia <sup>1</sup>	38.5	33.7	36.3	39.3	37.0	35.7	36.3	35.7	..
Serbia and Montenegro	27.9	32.1	..	x	x	x	x	x	x
Turkey <sup>1</sup>	14.6	22.1	25.2	21.8	20.8	20.3	25.2	x	x
Ukraine	46.5	32.4	54.3	31.3	38.5	43.8	54.3	50.1	..

Source: National sources, wiww.

<sup>1</sup> Monetary survey definition.

Table A15

**Official Key Interest Rate**

End of period, %

	2003	2004	2005	Oct. 05	Nov. 05	Dec. 05	Jan. 06	Feb. 06	March 06
Albania (repo rate) <sup>1</sup>	7.0	5.3	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Bosnia and Herzegovina	x	x	x	x	x	x	x	x	x
Bulgaria (official refinancing rate) <sup>2</sup>	2.8	2.4	2.1	2.0	2.0	2.1	2.2	2.3	2.3
Croatia (official discount rate) <sup>3</sup>	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
FYR Macedonia (basic central bank rate)	6.5	6.5	..	x	x	x	x	x	x
Romania (official refinancing rate) <sup>4</sup>	20.4	18.0	7.5	7.7	7.5	7.5	7.5	7.5	8.5
Russia (official refinancing rate) <sup>5</sup>	16.0	13.0	12.0	13.0	13.0	12.0	12.0	12.0	12.0
Serbia and Montenegro (discount rate)	9.0	8.5	..	x	x	x	x	x	x
Turkey (overnight deposit rate) <sup>6</sup>	26.0	18.0	13.5	14.0	13.8	13.5	13.5	13.5	13.5
Ukraine (refinancing rate)	7.0	9.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5

Source: Eurostat, Bloomberg, wiww, IMF.

<sup>1</sup> The Bank of Albania's basic interest rate.

<sup>2</sup> The Bulgarian National Bank's basic interest rate.

<sup>3</sup> Hrvatska narodna banka's basic rate for lending to commercial banks.

<sup>4</sup> From February 1, 2002, reference rate of Banca Națională a României.

<sup>5</sup> Charged by the Bank of Russia on three-month loans to commercial banks.

<sup>6</sup> The interest rate paid by Türkiye Cumhuriyet Merkez Bankası on overnight deposits.

Table A16

**Three-Month Interbank Rate<sup>1</sup>**

End of period, %

	2003	2004	2005	Oct. 05	Nov. 05	Dec. 05	Jan. 06	Feb. 06	March 06
Albania	x	x	x	x	x	x	x	x	x
Bosnia and Herzegovina	x	x	x	x	x	x	x	x	x
Bulgaria	3.5	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Croatia	8.3	6.7	6.0	5.6	5.7	6.0	5.0	4.9	3.8
FYR Macedonia	x	x	x	x	x	x	x	x	x
Romania	22.3	17.2	7.6	6.5	7.5	7.6	7.6	8.6	8.6
Russia	6.2	6.2	7.3	7.1	7.5	7.3	6.9	6.5	7.0
Serbia and Montenegro	x	x	x	x	x	x	x	x	x
Turkey	26.0	23.0	14.4	15.0	14.4	14.4	14.4	14.4	14.4
Ukraine	4.8	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5

Source: Bloomberg, Thomson financial.

<sup>1</sup> Ask rate.

Table A17

**Exchange Rate**

Period average, national currency per EUR (ECU)

	2003	2004	2005	Nov. 05	Dec. 05	Jan. 06	Feb. 06	March 06	April 06
Albania	137.6	127.6	124.0	122.7	122.6	123.8	122.5	122.7	122.9
Bosnia and Herzegovina	2.0	2.0	2.0	x	x	x	x	x	x
Bulgaria	1.9	2.0	2.0	2.0	2.0	2.0	2.0	..	..
Croatia	7.6	7.5	7.4	7.4	7.4	7.4	7.3	x	x
FYR Macedonia	61.3	61.3	61.3	x	x	x	x	x	x
Romania	3.8	4.1	3.6	3.7	3.7	3.6	3.5	..	..
Russia	34.7	35.8	35.2	34.0	34.2	34.3	33.7	33.5	..
Serbia and Montenegro	65.1	72.7	67.2	85.9	85.9	..	..	..	..
Turkey	1.7	1.8	1.7	1.6	1.6	1.6	1.6	..	..
Ukraine	6.0	6.6	6.4	6.0	6.0	6.1	6.0	..	..

Source: Eurostat, wiiv, national sources, Thomson financial.



# NOTES

# Legend, Abbreviations and Definitions

## Legend

- x = No data can be indicated for technical reasons  
.. = Data not available at the reporting date  
– = The numerical value is zero or smaller than half of the unit indicated  
Discrepancies may arise from rounding.

## Abbreviations

ARDL	autoregressive distributed lag
BA-CA	Bank Austria Creditanstalt
BEER	Behavioral Equilibrium Exchange Rate
BEEPS	Business Environment and Enterprise Performance Survey
BGN	Bulgarian lev
BIS	Bank for International Settlements
BNB	Bulgarian National Bank (Bălgarska Narodna Banka)
BNR	Banca Națională a României
BS	Banka Slovenije
BSM	basic structural model
CBR	Central Bank of Russia
CEB	Central Europe and the Baltic states
CEE	Central and Eastern Europe(ean)
CEE-5	Czech Republic, Hungary, Poland, Slovakia and Slovenia
CEECs	Central and Eastern European countries
CEEI	Conference on European Economic Integration (OeNB)
CES	Common Economic Space
CFS	Center for Financial Studies
CIS	Commonwealth of Independent States
ČNB	Česka národní banka
CPI	consumer price index
CZK	Czech koruna
DOLS	dynamic ordinary least squares
EBRD	European Bank for Reconstruction and Development
ECB	European Central Bank
ECM	error correction model
Ecofin	Council of Economic and Finance Ministers
EDP	excessive deficit procedure
EMU	Economic and Monetary Union
ENP	European Neighborhood Policy
ERM II	exchange rate mechanism II
ESA	European System of Accounts
ESCB	European System of Central Banks
EU	European Union
EUR	euro
FAVAR	factor-augmented vector autoregression
FDI	foreign direct investment
GARCH	Generalized Autoregressive Conditional Heteroscedasticity

GDP	gross domestic product
HICP	Harmonized Index of Consumer Prices
HNB	Hrvatska narodna banka
HRK	Croatian kuna
HP filter	Hodrick-Prescott filter
HUF	Hungarian forint
HVB	HypoVereinsbank
IFS	international financial statistics (IMF)
ILO	International Labor Organization
IMF	International Monetary Fund
IP	industrial production
IRF	impulse response function
LCP	local currency pricing
LFS	Labor Force Survey
MGE	mean group estimator
MMR	money market rate
MNB	Magyar Nemzeti Bank
MTM	monetary transmission mechanism
NATO	North-Atlantic Treaty Organisation
NBP	Narodowy Bank Polski
NBS	Národná banka Slovenska
NBU	National Bank of Ukraine
NCB	national central bank
NMS	new Member State(s) (EU)
OECD	Organisation for Economic Co-operation and Development
OeNB	Oesterreichische Nationalbank
OLS	ordinary least squares
OTP	Országos Takarékpénztár és Kereskedelmi Bank
PCP	producer currency pricing
PLN	Polish złoty
PPI	producer price index
PPP	purchasing power parity
PPS	purchasing power standard
RON	Romanian leu
RUB	Russian ruble
RZB	Raiffeisen Zentralbank
SEE	Southeastern Europe(an)
SEECs	Southeastern European Countries
SGP	Stability and Growth Pact
SIT	Slovenian tolar
SKK	Slovak koruna
STAR	smooth transition threshold autoregression
T-bill	treasury bill
TCMB	Türkiye Cumhuriyet Merkez Bankası
TRL	Turkish lira
TVC	time-varying coefficient
TVC-VAR	time-varying coefficient vector autoregression
ULC	unit labor costs

UN	United Nations
USD	U.S. dollar
VAR	vector autoregression
VAT	value-added tax
WIFO	Österreichisches Institut für Wirtschaftsforschung – Austrian Institute of Economic Research
wiiw	Wiener Institut für internationale Wirtschaftsvergleiche – The Vienna Institute for International Economic Studies
WTO	World Trade Organization

### Country Codes

AR	Argentina	JP	Japan
AT	Austria	KR	South Korea
AU	Australia	LT	Lithuania
BG	Bulgaria	LU	Luxembourg
BE	Belgium	LV	Latvia
BR	Brazil	MT	Malta
CA	Canada	MX	Mexico
CL	Chile	NL	Netherlands
CY	Cyprus	NO	Norway
CZ	Czech Republic	NZ	New Zealand
DE	Germany	PE	Peru
DK	Denmark	PH	Philippines
EE	Estonia	PL	Poland
EL	Greece	PT	Portugal
ES	Spain	RO	Romania
FI	Finland	RU	Russia
FR	France	SE	Sweden
GR	Greece	SI	Slovenia
HR	Croatia	SK	Slovakia
HU	Hungary	TH	Thailand
ID	Indonesia	TR	Turkey
IE	Ireland	UA	Ukraine
IL	Israel	UK	United Kingdom
IN	India	US	U.S.A.
IT	Italy	ZA	South Africa

## Definitions

*Bulgaria* is a candidate country within the EU enlargement process. A candidate country is a country that has formally applied to the European Union for membership and has been officially recognized by the European Council as a candidate for membership. As the Accession Treaty was signed on April 25, 2005, Bulgaria may be termed an acceding country.

Bulgaria applied for EU membership on December 15, 1995, and was formally recognized as a candidate country at the Helsinki European Council meeting on December 10 and 11, 1999. Accession negotiations were opened on February 15, 2000. Negotiations were provisionally closed in December 2004, and the Accession Treaty was signed on April 25, 2005. The Accession Treaty will have to be ratified by the national parliaments of the 25 EU Member States and those of Bulgaria and Romania by the end of 2006 in order to enter into legal force.

The Accession Treaty provides for accession on January 1, 2007. The European Commission considers in its May 2006 Monitoring Report that Bulgaria will be prepared for EU membership on January 1, 2007, provided that the authorities address a number of outstanding issues, primarily the fight against corruption and organized crime as well as further reforms of the judiciary system (in particular the reinforcement of its transparency, efficiency and impartiality). The European Commission will report on Bulgaria's progress in October 2006. Based on this report, it may recommend to the European Council to postpone the date of accession to January 1, 2008. In the event of such a recommendation, the European Council may decide in favor of postponement, but such a decision would require unanimous agreement.

*Romania* is a candidate country within the EU enlargement process. A candidate country is a country that has formally applied to the European Union for membership and has been officially recognized by the European Council as a candidate for membership. As the Accession Treaty was signed on April 25, 2005, Romania may be termed an acceding country.

Romania applied for EU membership on June 22, 1995, and was formally recognized as a candidate country at the Helsinki European Council meeting on December 10 and 11, 1999. Negotiations were provisionally closed in December 2004, and the Accession Treaty was signed on April 2005. The Accession Treaty will have to be ratified by the national parliaments of the 25 EU Member States and those of Bulgaria and Romania by the end of 2006 in order to enter into legal force.

The Accession Treaty provides for accession on January 1, 2007. The European Commission considers in its May 2006 Monitoring Report that Romania will be prepared for EU membership on January 1, 2007, provided that the authorities address a number of outstanding issues, primarily the fight against corruption, the implementation of the ongoing judicial reform and the enhancement of the transparency, efficiency and impartiality of the judiciary system. The European Commission will report on Romania's progress in October 2006. Based on this report, it may recommend to the European Council to postpone the date of accession to January 1, 2008. In the event of such a recommendation, the European Council may decide in favor of post-

ponement, but such a decision requires unanimous agreement, with the exception of a decision taken on the grounds of nonfulfillment of obligations relating to the negotiation chapters Justice and Home Affairs as well as Competition, which may be taken by qualified majority.

*Croatia* is a candidate country within the EU enlargement process. A candidate country is a country that has formally applied to the European Union for membership and has been officially recognized by the European Council as a candidate for membership. As accession negotiations were opened on October 3, 2005, Croatia may be termed an accession country.

Croatia applied for EU membership on February 21, 2003, and was formally recognized as a candidate country at the Brussels European Council meeting on June 17 and 18, 2004. Accession negotiations were opened on October 3, 2005.

*Turkey* is a candidate country within the EU enlargement process. A candidate country is a country that has formally applied to the European Union for membership and has been officially recognized by the European Council as a candidate for membership. As accession negotiations were opened on October 3, 2005, Turkey may be termed an accession country.

Turkey applied for EU membership on April 14, 1987, and was formally recognized as a candidate country at the Helsinki European Council meeting on December 10 and 11, 1999. Accession negotiations were opened on October 3, 2005.

The *Former Yugoslav Republic of Macedonia* is a candidate country within the EU enlargement process. A candidate country is a country that has formally applied to the European Union for membership and has been officially recognized by the European Council as a candidate for membership.

The Former Yugoslav Republic of Macedonia applied for EU membership on March 22, 2004, and was formally recognized as a candidate country at the Brussels European Council meeting on December 15 and 16, 2005.

## List of Studies and Special Reports Published in Focus on European Economic Integration<sup>1</sup>

For further details see [www.oenb.at](http://www.oenb.at).

### Issue 2/05

Banking in Central and Eastern Europe since the Turn of the Millennium –  
An Overview of Structural Modernization in Ten Countries

*Stephan Barisitz*

Developments in Credit to the Private Sector in Central and Eastern  
European EU Member States: Emerging from Financial Repression –  
A Comparative Overview

*Peter Backé and Tina Zumer*

Can Banking Intermediation in the Central and Eastern European  
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from the Perspective of the International Monetary Fund

*Ingrid Ettl and Alexandra Schober-Rhomberg*

For a comprehensive list of studies and special reports published in Focus  
on Transition, please see Focus on European Economic Integration 1/04,  
pp. 199–203.

<sup>1</sup> Focus on Transition was published up to issue 2/2003 and has been replaced by Focus on European Economic Integration since issue 1/04.

# Periodical Publications of the Oesterreichische Nationalbank

For further details see [www.oenb.at](http://www.oenb.at)

## **Monetary Policy & the Economy**

quarterly

This quarterly publication, issued both in German and English, offers analyses of current cyclical developments, medium-term macroeconomic forecasts and studies on central banking and economic policy topics. It also summarizes the findings of macroeconomic workshops and conferences organized by the OeNB.

## **Statistiken – Daten & Analysen**

quarterly

This publication contains brief reports and analyses focusing on Austrian financial institutions, cross-border transactions and positions as well as financial flows. The contributions are in German, with executive summaries of the analyses in English. The statistical part covers tables and explanatory notes on a wide range of macroeconomic and financial indicators. The tables and additional information and data are also available on the OeNB's website in both German and English. This series also includes special issues on selected statistics topics published at irregular intervals.

## **econ.newsletter**

quarterly

The quarterly English-language newsletter is published only on the Internet and informs an international readership about selected findings, research topics and activities of the OeNB's Economic Analysis and Research Section. This publication addresses colleagues from other central banks or international institutions, economic policy researchers, decision makers and anyone with an interest in macroeconomics. Furthermore, the newsletter offers information on current publications, studies or working papers as well as events (conferences, lectures and workshops).

For further details see [www.oenb.at/econ.newsletter](http://www.oenb.at/econ.newsletter)

## **Financial Stability Report**

semiannual

Issued both in German and English, the Financial Stability Report contains first, a regular analysis of Austrian and international developments with an impact on financial stability and second, studies designed to provide in-depth insights into specific topics related to financial market stability.

### **Focus on European Economic Integration** semiannual

The English-language publication Focus on European Economic Integration is the successor publication to Focus on Transition (published up to issue 2/2003). Reflecting a strategic regional research priority of the OeNB, this publication is a channel for communicating our ongoing research on Central and Eastern European countries (CEECs) as well as Southeastern European (SEE) countries ranging from economic country studies to studies on central banking issues and related topics. One of the purposes of publishing theoretical and empirical studies in the Focus on European Economic Integration, which are subject to an external refereeing process, is to stimulate comments and suggestions prior to possible publication in academic journals.

### **Workshops – Proceedings of OeNB Workshops** three to four issues a year

The Proceedings of OeNB Workshops were introduced in 2004 and typically comprise papers presented at OeNB workshops at which national and international experts, including economists, researchers, politicians and journalists, discuss monetary and economic policy issues. Workshop proceedings are available in English only.

### **Working Papers** about ten papers a year

The OeNB's Working Paper series is designed to disseminate, and provide a platform for discussing, findings of OeNB economists or outside contributors on topics which are of special interest to the OeNB. To ensure the high quality of their content, the contributions are subjected to an international refereeing process.

### **Economics Conference (Conference Proceedings)** annual

The Economics Conference hosted by the OeNB represents an important international platform for exchanging views and information on monetary and economic policy as well as financial market issues. It convenes central bank representatives, economic policymakers, financial market players, academics and researchers. The conference proceedings comprise all papers presented at the conference, most of them in English.

### **Conference on European Economic Integration (Conference Proceedings)** annual

This series, published in English by a renowned international publishing house, reflects presentations made at the OeNB's annual conference on Central, Eastern and Southeastern European issues and the ongoing EU enlargement process (formerly East-West Conference).

For further details see [ceec.oenb.at](http://ceec.oenb.at)

### **Annual Report**

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The Annual Report of the OeNB provides a broad review of Austrian monetary policy, economic conditions, new developments in the financial markets in general and in financial market supervision in particular as well as of the OeNB's changing responsibilities and its role as an international partner in cooperation and dialogue. It also contains the OeNB's financial statements.

### **Intellectual Capital Report**

annual

The Intellectual Capital Report has been published since 2003 as a review of the OeNB's intellectual capital and its use in the OeNB's business processes and services. The report provides an integrated view of the strategically important management of human, relational, structural and innovation capital; it clarifies the relationships between different types of capital and describes various determinants that influence the OeNB's intellectual capital. The findings of the report serve to assess the consistency of the OeNB's intellectual capital with its knowledge-based strategic orientation.

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***Imprint***

*Publisher and editor:*

*Oesterreichische Nationalbank*

*Otto-Wagner-Platz 3, AT 1090 Vienna*

*Günther Thonabauer, Communications Division*

*Internet: [www.oenb.at](http://www.oenb.at)*

*Printed by: Oesterreichische Nationalbank, AT 1090 Vienna*

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**DVR 0031577**

**Vienna, 2006**



Geprüftes Umweltmanagement  
A-000311