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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,

The recent months have brought with them the concrete prospect of another euro area enlargement: Malta and Cyprus, the two islands that joined the European Union in 2004, applied for monetary union membership in spring 2007. Having fulfilled the convergence criteria, they received a positive assessment, and will join monetary union on January 1, 2008, as a result. Hence, we will be able to celebrate again just one year after Slovenia entered monetary union. Of course, these two countries' economies are tiny, and in various respects, they have a different starting point than Slovenia had. Hence, they did not have to undergo the typical transformation and catching-up process we often speak about when characterizing economic developments in new Member States. However, this should not detract from the fact that these two countries' monetary union entry can be termed a success story, and is highly welcomed.

The catching-up process in Central, Eastern and Southeastern European (CESEE) countries remains solidly underway, especially as economic growth in the euro area has gained further momentum and appears to be quite robust. Still, some ongoing critical issues remain, on which this issue of Focus on European Economic Integration (FEEI) tries to shed light. One of the hot topics is housing prices, which have surged across the region in the context of the overall catching-up process. As a housing price boom often occurs in tandem with strong credit growth and may therefore entail inflationary as well as financial market stability risks, Balázs Égert and his coauthor Dubravko Mihaljek of the Bank for International Settlements took a closer look at the determinants of house price dynamics in Central and Eastern Europe. This paper shows that, overall, the growth in house prices in Central and Eastern Europe can be explained fairly well by the development of conventional underlying fundamentals and transition-specific factors.

Another interesting, though far less risky phenomenon is currency substitution in Central and Eastern European countries (CEECs). The Oesterreichische Nationalbank (OeNB) realized the vital importance of this topic early and has conducted surveys in the region for several years. Based on the data collected, Doris Ritzberger-Grünwald and Helmut Stix wrote a study entitled *Are Euro Cash Holdings in Central and Eastern Europe Driven by Experience or Anticipation? Results from an OeNB Study*; they try to find answers to the questions of who holds how much euro cash in the CEECs and why. The authors find that a substantial share of the population in the respective countries holds euro cash. Interestingly, there is little evidence that inflation or exchange rate expectations are important motives – persistence seems to be more crucial. Not surprisingly, the prospect of eventual euro introduction increases the demand for euro and the use of euro for domestic payments.

Another key issue – especially for central bankers in the EU – is central bank independence. At the beginning of the integration process, political and institutional issues are usually tantamount. Sandra Dvorsky, author of the study *Central Bank Independence in Southeastern Europe with a View to Future EU Accession* (published in FEEI 2/2004), reexamined the situation in Southeastern Europe and finds that some countries have achieved further

progress in aligning central bank legislation with Treaty requirements during the last three years, thus updating her earlier study. As in 2004, the degree of central bank independence continues to correspond largely to the respective country's level of integration with the EU. The main weaknesses can still be found in the area of personal independence, in particular in the provisions on the dismissal of central bank top officials. Further crucial areas are the prohibition of monetary financing and provisions on loss coverage. The paper concludes that legal arrangements to protect the status of the central bank are a necessary, though not sufficient, prerequisite for central bank independence. In fact, the importance of practical implementation cannot be overestimated.

The countries covered by the next study are much further ahead in the integration process. In her paper entitled *Are the Exchange Rates of EMU Candidate Countries Anchored by Their Expected Euro Locking Rates?* Anna Naszódi, one of the winners of the OeNB's 2006 Olga Radzyner Award, examines whether the exchange rates of the Czech koruna, the Hungarian forint and the Polish złoty were anchored by the market expectations for their euro locking rates in a certain period. The paper filters out subjective expectations, i.e. political considerations, from market expectations. Overall, the author finds that the stabilizing effect of locking is the smallest for the Czech Republic and highest for Poland.

One of the core questions in economy is how to forecast changes of economic states and dynamics, not only in terms of business cycles – note the turning point debate – but also in terms of macrofinancial stability. In this vein, Tomáš Slačik and his coauthor Jesús Crespo Cuaresma, professor at the University of Innsbruck, contribute to predicting currency crises by exploring the properties of the term structure of relative interest rates. This indicator complements long-horizon models that have been widely used so far. The authors apply this method to currency crises in the Czech Republic in 1997 and in Russia in 1998 and find evidence that the indicator they have developed would have performed well as a real-time predictor in both episodes of currency distress.

In times of skyrocketing oil prices, global warming and political distress, energy economics is high on the agenda, with Russia, one of the world's biggest oil and gas suppliers, playing a major role. Therefore, everything which increases our knowledge about this subject and related aspects should be highly appreciated. Stephan Barisitz and his coauthor, Simon-Eric Ollus from the Bank of Finland, have taken a closer look at possible effects of high oil prices on the Russian economy itself in their study entitled *The Russian Nonfuel Sector: Signs of the Dutch Disease?* They examine whether a sharp rise of commodity prices results in an appreciation of the real exchange rate, undermining the competitiveness of manufacturing. Russia appears to be facing incipient deindustrialization at least in some parts of the manufacturing sector, find the authors, which is in line with the Dutch disease theory.

Another white spot on our knowledge map may be filled by Vasily Astrov from The Vienna Institute for International Economic Studies (wiiw), who wrote a study on the Russian Oil Fund as a Tool of Stabilization and Sterilization during his recent research stay at the OeNB's Foreign Research Division. Initially, the Russian Oil Stabilization Fund (OSF) was set up to reduce the

vulnerability of the budget to oil price volatility and to sterilize the impact of oil-related foreign exchange inflows on the money supply. Astrov's findings suggest that the OSF has been instrumental in achieving both goals: It has contributed to macroeconomic stability and has helped decouple the GDP growth rate from oil price dynamics. However, given its current size and a widely shared expectation that oil prices will remain rather high, the question has arisen whether the OSF should be increasingly spent or whether it should be saved as a wealth-generating vehicle.

I am certain that you will find new insights or thought-provoking inputs for discussions among these widely varying topics. In addition, I would like to announce the date and subject of our next Conference on European Economic Integration (CEEI) in Vienna: It will be held November 19 and 20, 2007, and will deal with the topic Currency and Competitiveness. If you are interested in joining us for two days of lectures, meetings with experts and enlightening discussions, please do not hesitate to contact us at ceei@oeb.at. If you have any comments or are looking to exchange ideas on the FEEI, please write to

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Foreign Research Division
PO Box 61
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You may also fax your comments to (43-1) 404 20-5299 or mail them to doris.ritzberger-gruenwald@oeb.at, Head of the Foreign Research Division.

Klaus Liebscher
Governor

RECENT ECONOMIC DEVELOPMENTS

Developments in Selected Countries¹

1 Introduction

Slovenia adopts euro in January 2007 after meeting the convergence criteria

After having fulfilled the convergence criteria in a sustainable manner, Slovenia was the first country among the new EU Member States to adopt the euro at the beginning of 2007. The changeover to the single currency went smoothly and quickly, and public surveys suggest a high level of acceptance of the euro among the Slovenian population. According to preliminary information by Eurostat, the introduction of the euro had only a temporary and limited impact on consumer price inflation in Slovenia during and after the changeover period.

Newcomers to the EU: Bulgaria and Romania

On January 1, 2007, Bulgaria and Romania joined the European Union. While their combined population accounts for some 6% of the population in the EU-27, their economic weight in the EU is much lower, accounting for about 1% of total GDP at market exchange rates and around 2% of GDP at PPP. In the run-up to EU accession, the two countries had undertaken major efforts and made substantial progress in meeting EU membership criteria. Still, at the time of accession, some structural and institutional weaknesses remained to be resolved in various areas (e.g. internal market issues, jurisdiction, corruption and organized crime). The Treaty of Accession provides for special safeguard clauses to be triggered in case the reforms are considered insufficient. Given that after accession, the reform process seems to have slowed down in some key areas in both countries, the European Commission has an important role in that it monitors the countries' progress with respect to achieving full compliance with the EU membership criteria. The European Commission will publish a new report on the progress made by Bulgaria and Romania in June 2007.

Croatia and Turkey engaged in EU accession negotiations

The accession process of Croatia and Turkey continues. While most of the 35 negotiation chapters of the *acquis* screening process have been completed for Croatia, about half of the chapters have been screened for Turkey. By now, six chapters of accession negotiations have been opened with Croatia and two with Turkey. Of these, two chapters have been closed provisionally with Croatia ("Science and Research" and "Education and Culture"), while one chapter has been tentatively closed with Turkey ("Science and Research").² The Republic of Macedonia is an EU candidate country as well. However, accession negotiations with this country have not started yet.

General economic performance in CESEE remains fairly favorable

In the second half of 2006 and into early 2007, the economic performance of the ten Central, Eastern and Southeastern European (CESEE) countries covered in this report³ has been characterized by dynamic output growth and improving labor market conditions. The competitive position of the region as a whole has been preserved, as solid wage growth (and exchange rate appreciation) has been offset by vibrant productivity increases, with unit labor costs (ULC) in industry (in euro terms) growing fast only in Romania and Russia. Inflation developments have been varied but rather benign in most

¹ Compiled by Antje Hildebrandt with input from Stephan Barisitz, Balázs Égert, Johann Elsinger, Thomas Reininger, Thomas Scheiber, Josef Schreiner, Tomas Slacik and Zoltan Walko.

² In December 2006, the EU Council decided to postpone negotiations with Turkey on eight chapters owing to disputes over the status of Cyprus.

³ Czech Republic, Hungary, Poland, Slovakia, Slovenia (also referred to as Central and Eastern Europe), Bulgaria, Croatia, Romania, Turkey (Southeastern Europe), as well as Russia.

Table 1

Gross Domestic Product (Real)

Annual change in %

	2004	2005	2006	Q3 2005	Q4 2005	Q1 2006	Q2 2006	Q3 2006	Q4 2006
Slovenia	4.4	4.0	5.2	3.8	3.9	5.0	4.7	5.6	5.5
Bulgaria	6.6	6.2	6.1	5.4	6.0	5.5	6.4	6.7	5.7
Czech Republic	4.2	6.1	6.1	6.0	6.7	6.4	6.2	5.9	5.8
Hungary	4.9	4.2	3.9	4.3	4.8	4.9	3.8	3.8	3.2
Poland	5.3	3.5	5.8	4.1	4.5	5.2	5.5	5.8	6.4
Romania	8.4	4.1	7.6	2.4	4.2	6.7	7.7	8.2	7.6
Slovakia	5.4	6.0	8.3	6.3	7.5	6.7	6.7	9.8	9.6
Croatia	4.3	4.3	4.8	5.2	4.8	6.1	3.6	4.7	4.8
Turkey	8.9	7.4	6.1	7.7	9.5	6.7	8.3	4.8	5.2
Russia	7.1	6.4	6.7	6.6	8.0	5.0	7.0	6.8	7.7

Source: Eurostat, national statistical offices, wiiv.

countries. Except for Russia, which ran sizeable surpluses, the countries in the region recorded combined current and capital account deficits, which have widened in many cases in the course of 2006 owing to both strong capital formation and consumption growth. Fiscal performance continues to be very diverse. Budget balances were broadly steady or improved somewhat in 2006 in most of the ten countries, also helped by robust GDP growth. Still, more consolidation efforts are needed in the region.

Real GDP growth in the ten countries under review ranged from about 4% to somewhat more than 8% in 2006, which is markedly above the euro area growth rate (2.7%) and in most of the ten countries also higher than in 2005. Per capita income convergence continued: In 2006, Slovenia already reached nearly 80% of the euro area average and, like the Czech Republic (72%), moved ahead of Portugal with regard to GDP per capita in PPP terms.

What were last year's main drivers of economic activity? A glance at the sources of growth indicates that domestic demand was the main contributor to GDP growth across the region except in Hungary, which saw a major decline of private consumption growth, largely related to tighter fiscal policy. Average annual growth picked up noticeably in 2006 in Poland, Romania and Slovakia. In general, private consumption was supported by robust real wage increases, real credit growth to the private sector⁴ and improvements on the labor market. The other main component of domestic demand, gross fixed capital formation, was aided primarily by strong FDI inflows, favorable credit conditions as well as by higher inflows, and a better absorption, of EU structural funds. However, investment growth moderated in Slovakia, Bulgaria and Turkey in 2006; but even in these cases capital formation growth remained strong or at least fairly robust. Only Hungary registered a contraction of gross fixed capital formation, which was largely the result of fiscal tightening. Overall, gross fixed capital

Robust economic growth continues and is increasingly driven by domestic demand

⁴ The increase in real credit to the private sector ranged between close to 10% in Hungary and around 47% in Romania (year-on-year change in December 2006, deflated by the December 2006 inflation rate). Compared with December 2005, credit growth rates declined only in Bulgaria, Hungary and Turkey. Real credit to the private sector in the euro area grew by about 9% in 2006. Comparisons of credit growth rates need to take into account that credit-to-GDP levels in CESEE were low until a few years ago, which means that catching-up effects have played a role in recent credit developments.

formation grew more strongly than consumption in all countries but Hungary, and consumption expanded less than overall GDP in the CEECs as well as in Croatia and Turkey.

The contribution of net exports to GDP growth turned out to be positive (or marginally negative) in Central and Eastern Europe (CEE), Croatia and Turkey, but strongly negative (almost hitting 10 percentage points) in Bulgaria and Romania. In Russia, the contribution of net exports to growth was also negative but more moderate. Compared with 2005, an increase in the contribution of net exports to growth was registered only in Hungary and, in particular, in Slovakia (as well as in Turkey). Export growth picked up in most of CEE in 2006 and reached very high rates in Slovakia (+20%) and Hungary (+18%). In Southeastern Europe and Russia, export growth was steady or accelerated slightly. Import growth speeded up in all countries (except Turkey), accelerating markedly in the Czech Republic, Poland and Romania. Import growth in 2006 ran at particularly brisk rates of more than 20% in Romania and Russia, partly reflecting high demand for Western European durable consumer goods.

From 2005 to 2006, the average level of capacity utilization in industry increased in all new EU Member States covered in this report, except in Slovakia. The decline in capacity utilization in Slovakia is related to new automobile production plants that opened in the third quarter of 2006⁵ and appears to be only of temporary nature, as capacity constraints increased again in the last quarter of 2006. Capacity utilization accelerated the most in Bulgaria and Romania – namely by more than 4 percentage points to about 68% and 77%, respectively. The Czech Republic, Hungary and Slovenia reached capacity utilization levels of more than 80% on average in 2006.

Compared with 2005, labor market conditions improved in part significantly in 2006 in most of the countries under review. Unemployment (ILO definition) fell most markedly in Poland and Slovakia, albeit from high levels. It appears that robust economic growth and considerable gross FDI inflows have eventually fed through more strongly to the labor market. In some cases (e.g. Poland), however, unemployment statistics have improved, also owing to increased labor migration after EU accession. In several countries, e.g. in the Czech Republic, Slovakia, Poland and Romania, the tightening of labor markets combined with rapid economic expansion, and in some cases with stark regional differences,⁶ has already put upward pressures on wages.

Nominal wages in the industry sector picked up strongly in the two newest EU Member States, Bulgaria and Romania, hitting growth rates of around 10% and 16% year on year in 2006.⁷ In the CEECs, nominal wage growth turned out to be more moderate (unweighted average of 6½% year on year), but increases were higher (or only marginally lower) than in 2005. However, in all five CEECs under review, wage increases in industry were more than matched by productivity increases, thus leading to a decline in ULC (in nominal

Labor market improves
in 2006

Rising wages
accompanied by
improved productivity:
What is the impact on
competitiveness?

⁵ After having reached nearly 80% in the first and second quarters of 2006, the capacity utilization level declined below 70% in the third quarter.

⁶ In the Czech Republic, for example, joblessness ranges between 2% in Prague and above 18% in the coal mining regions.

⁷ In Russia, wages increased by even more than 20% (year on year).

terms and in local currency). In the remaining countries – Bulgaria, Croatia, Romania, Turkey and Russia – productivity improvements could not keep up with wage rises. Consequently, ULC in industry went up in 2006, though to rather varying degrees: Moderate increases were recorded in Croatia at 1.7%, while Russia posted strong ULC growth at 12.1%.

A somewhat different picture emerges when taking account of exchange rate movements, measuring ULC in euro terms. In this case, the competitive position is measured as ULC changes in euro terms relative to developments in the euro area.⁸ It was rather stable in Poland, Slovakia and Slovenia, while deteriorating somewhat in the Czech Republic. Hungary, in turn, improved its relative ULC position, helped by the depreciation of the forint against the euro in 2006 (in annual average terms). Croatia's and Bulgaria's ULC positions weakened somewhat, while Turkey retained its competitive edge, given the currency's marked weakening in the first half of 2006.⁹ In Romania and, even more so, in Russia, competitiveness worsened tangibly in ULC terms. A country's market shares in euro area imports is another measure of competitiveness; in 2006, this measure has been stable or on the rise in all countries under review.¹⁰ For the time being, this situation provides some comfort, particularly as terms of trade have deteriorated in most countries (except Russia). At the same time, lagged negative effects on export performance cannot be excluded, in particular for countries with fast-rising ULC in euro terms.

Table 2

Wages, Productivity, Unit Labor Costs

Annual change in %

	Nominal wages in industry		Productivity in industry		ULC in industry (in local currency)		EUR per local currency (annual average)		ULC in industry (in local currency)	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
Slovenia	5.8	5.5	5.9	8.8	-0.1	-3.1	-0.2	-0.0	-0.3	-3.1
Bulgaria	8.1	10.8	3.4	8.2	4.6	2.5	-0.1	0.0	4.4	2.5
Czech Republic	4.6	6.8	6.8	8.6	-2.1	-1.7	7.1	5.1	4.9	3.3
Hungary	7.2	8.5	10.1	11.7	-2.6	-2.9	1.5	-6.1	-1.2	-8.9
Poland	3.2	5.2	2.9	9.5	0.3	-4.0	12.6	3.2	12.9	-0.8
Romania	16.8	15.7	4.4	11.3	11.9	4.0	11.8	2.7	25.2	6.8
Slovakia	7.3	6.7	0.6	11.3	6.6	-4.1	3.7	3.7	10.6	-0.6
Croatia	5.3	7.5	6.2	5.7	-0.8	1.7	1.3	1.1	0.5	2.8
Turkey	12.2	11.5	6.0	6.7	5.9	4.5	5.9	-7.3	12.1	-3.1
Russia	21.1	21.4	7.3	8.3	12.8	12.1	1.7	3.3	14.7	15.8
Memo item:										
Euro area	1.5	2.5	2.8	4.6	-1.2	-2.0	..	..	-1.2	-2.0

Source: Eurostat, national statistical offices, wiiv.

⁸ By comparison, in the euro area ULC in industry (in nominal terms) fell by around 2% in 2006 year on year. ULC in the euro area are especially relevant in this context, given that the euro area is the main trading partner of the country group under review.

⁹ See Focus on European Economic Integration 2/06.

¹⁰ Market share gains were particularly strong in 2006 in Poland and in Russia, in the latter case owing to the fact that the high oil price in the first seven months of the year raised oil export revenues.

Inflation rates remain largely stable or decrease in 2006 but vary more in early 2007

In 2006, inflation was largely stable or declined in the countries under review, with the exception of Hungary (and Turkey), while displaying a somewhat more varied, but still fairly amenable, picture in early 2007. Lower oil prices since late summer 2006, nominal exchange rate appreciation in many countries and, in some cases, favorable food price developments have helped contain price dynamics. Inflation remained fairly low in the Czech Republic and Poland in 2006, and picked up somewhat in early 2007. In Slovenia, too, inflation was kept at relatively low levels. On the back of currency appreciation, in the last quarter of 2006 and the first quarter of 2007 inflation in Slovakia moderated to similar levels as in the Czech Republic, Poland and Slovenia. Since mid-2006, the inflation rate in Hungary has moved up markedly, peaking at 9% year on year in February and March 2007. This rise was primarily attributable to increased indirect taxes and higher administered prices, both being part of a fiscal consolidation package.

Romania's disinflation continued to proceed gradually, reaching inflation rates below 4% in the first quarter of 2007, the lowest level since the beginning of the transformation process. Bulgaria, after recording inflation rates in the upper single digits in 2006, succeeded in reducing inflation to 4½% in February and March 2007, helped by base effects. In both cases, price developments were presumably also positively affected by EU accession.

Inflation in Turkey picked up to around 10% in 2006 and early 2007. At the same time, the pass-through of the large depreciation in the spring of 2006 remained relatively contained. Russia's inflation declined gradually, reaching single-digit territory in 2006. Still, inflation in Russia again proved to be rather persistent and it may be difficult to further trim it.

Currencies appreciate across the region in the second half of 2006

On the back of continued favorable economic prospects, the currencies of the new EU Member States have generally gained against the euro, in particular since mid-2006. Currency appreciation from mid-2006 to mid-April 2007 moved within a range of around 13% (Hungary and Slovakia) to some 6% to 7% (Poland and Romania, respectively) to around 2% (Czech Republic¹¹). In

Table 3

Consumer Price Index (here: HICP)

Annual change in %

	2005	2006	Q3 2005	Q4 2005	Q1 2006	Q2 2006	Q3 2006	Q4 2006	Q1 2007
Slovenia	2.5	2.5	2.3	2.6	2.3	3.1	2.5	2.3	2.6
Bulgaria	6.0	7.4	6.9	7.8	8.7	8.6	6.7	5.7	5.3
Czech Republic	1.6	2.1	1.6	2.2	2.4	2.5	2.4	1.1	1.7
Hungary	3.5	4.0	3.5	3.2	2.4	2.7	4.6	6.4	8.8
Poland	2.2	1.3	1.8	1.2	0.9	1.4	1.5	1.3	2.0
Romania	9.1	6.6	9.0	8.5	8.7	7.2	5.9	4.8	3.9
Slovakia	2.8	4.3	2.2	3.7	4.2	4.6	4.8	3.5	2.1
Croatia ¹	3.4	3.2	3.5	4.0	3.5	3.8	3.2	2.2	1.5
Turkey	8.1	9.3	7.8	7.3	7.6	9.2	10.6	9.7	10.3
Russia ¹	12.5	9.8	12.5	11.2	10.8	9.6	9.6	9.2	7.9

¹ CPI.

Source: Eurostat, national statistical offices, wiw.

¹¹ Interestingly, the Czech koruna depreciated by almost 2% against the euro in the first three-and-a-half months of 2007, after having appreciated in the second half of 2006.

Slovenia the tolar was stable against the euro until it was replaced by the single currency, while in Bulgaria (which continues to operate a currency board arrangement) the exchange rate to the euro also remained unchanged. Owing to financial turbulences affecting the Turkish economy, the lira depreciated by more than 25% in the first half of 2006, but the currency appreciated again by around 9% from mid-2006 to mid-April 2007. In Croatia and Russia, in turn, currency fluctuations to the euro remained rather limited.

Over the last months, several new governors were appointed to head the central banks in the region. In Hungary, András Simor became governor with effect from March 2007, succeeding Zsigmond Járαι. That same month, the term of the Slovenian central bank governor Mitja Gaspari expired. After the Slovenian parliament had rejected two nominees proposed by the president, the president did not present a new nominee in time for parliament's regular April session. Banka Slovenije is currently represented in the Governing Council of the ECB by its deputy governor. At the beginning of 2007, Sławomir Skrzypek was appointed president of Narodowy Bank Polski, replacing Leszek Balcerowicz.

In all countries under review but Russia, the combined current and capital accounts were in deficit in 2006. Deficits turned out to be higher in all countries than a year earlier, except in Hungary and Slovakia. Sizeable income balance deficits, driven by the high profitability of foreign-owned companies, have played an important role in this context, especially in CEECs (apart from Slovenia). External imbalances are particularly high in Bulgaria and Romania: The large deficits (slightly more than 10% of GDP in Romania and even above 15% in Bulgaria) are mainly attributable to a worsening of the trade balance, as export growth could not keep up with import growth in a setting of buoyant domestic demand. However, the deficit was largely covered by net FDI inflows in Romania and fully covered in Bulgaria.

During the latter part of 2006 and in early 2007, no major monetary policy changes occurred in the ten countries covered here, apart from Slovenia's accession to the euro area. Since the fall of 2006, interest rates have been on hold in the Czech Republic and Hungary, but also in Turkey. Most recently, Poland increased its key rate by 25 basis points, citing first signs of rising inflationary pressures. Slovakia and Romania, in turn, lowered interest rates by 50 and 125 basis points, respectively, in early 2007. The rate cuts were motivated by declining inflation, but also helped contain appreciation pressures on the Slovak koruna and the Rumanian leu.

As in earlier years, fiscal outcomes in the ten countries under review were very varied in 2006, ranging from a very high deficit in Hungary to a sizeable surplus in Bulgaria and, even more so, in Russia. Fiscal positions worsened in Hungary (where the deterioration was considerable but still contained by a consolidation program implemented in mid-2006), but also in Slovakia (partly due to rising pension reform costs)¹² and Romania (which went on a spending spree at end-2006). The remaining countries registered at least moderate

Personnel changes in several central banks

Combined current and capital account positions in deficit throughout the region, except in Russia

Monetary policy developments in other countries

Fiscal performance varies widely

¹² After the expiry of a transitional arrangement, pension reform costs relating to the creation of a mandatory funded pillar have to be allocated to the general government budget since the beginning of this year. This is particularly relevant for Poland, Hungary and Slovakia (see also country sections below).

improvements in their fiscal balances, supported by strong growth. Croatia continued with its gradual fiscal consolidation strategy, while Turkey reached a small surplus for the first time in many years and Russia recorded another high budgetary surplus.

European Commission closely monitors fiscal policy of EU member and candidate countries

EU Member States are obliged to submit so-called stability or convergence programs¹³ (and annual updates) to the Council of the European Union (EU Council) and the European Commission. These programs, which contain as their core element the respective country's budgetary position and its medium-term fiscal framework, are assessed by the European Commission and evaluated by the EU Council. In a similar vein, EU candidate countries submit Pre-Accession Economic Programmes, on which the EU and the respective candidate country adopt joint opinions.

Central Europe: Slovenia submits first stability program, other countries still post excessive deficits

Slovenia's public finances, as set out in the country's first stability program, were generally considered prudent by the EU Council, while it was sensed that the country's efforts to reduce the structural deficit over the medium term could be more ambitious.

Among the countries discussed in this report, the Czech Republic, Hungary, Poland and Slovakia have been subject to an Excessive Deficit Procedure (EDP) since 2004. That year, the EU Council gave Poland and Slovakia time until 2007 to correct the excessive deficit, while the respective deadline was set to 2008 for the other two countries. Last year, the deadline for Hungary was shifted to 2009. Based on the most recent updates of the convergence programs, the EU Council concluded that Slovakia and Hungary are on track to meet these deadlines, provided that policy plans are fully implemented. This is particularly crucial for Hungary, which has had an ambitious medium-term consolidation program in place since mid-2006 to substantially reduce the deficit from around 9% of GDP recorded in 2006. As for Poland, the measures taken were assessed to be insufficient to meet the 2007 deadline (deficit target for 2007: 3.4% of GDP) and the EU Council issued a recommendation to Poland to take the necessary measures to bring the excessive deficit situation to an end in 2007. The Czech Republic's program, which was submitted only in March 2007 and contains a deficit target of 4% of GDP for 2007 and 3½% for 2008, still awaits assessment by the EU Council.

Bulgaria and Romania submit their first convergence programs after EU accession

Bulgaria and Romania submitted their first convergence programs in December 2006. In its convergence program (which was complemented by an explanatory note in January 2007), Bulgaria expects to achieve a budgetary surplus of 2% this year and 1.5% of GDP in the next two years.¹⁴ Overall, the EU Council provides a positive assessment of Bulgaria's budgetary position. By contrast, the evaluation of Romania's program is rather disapproving: With planned deficits of nearly 3% of GDP in 2007 and 2008, the EU Council particularly criticizes the procyclical nature of the fiscal program in a setting of already high external imbalances.

¹³ Euro area members are required to submit stability programs, while the other EU Member States have to submit convergence programs (and annual updates).

¹⁴ Moreover, vis-à-vis the IMF, Bulgaria recently pledged to increase its surplus target to 2.3% of GDP in an effort to contain the country's external imbalances.

Croatia and Turkey recently tabled new Pre-Accession Economic Programmes. The Croatian program foresees a further reduction of fiscal deficits from 2.2% in 2006 to 1.5% in 2009, while not always being very specific on the underlying measures taken to achieve these targets. A similar picture emerges for Turkey and its pledge of continued fiscal restraint, following up on its performance in recent years.¹⁵ However, the program remains rather generic on how to achieve this objective and how to contain medium-term fiscal risks. Joint conclusions on these programs (and on the program submitted by the Republic of Macedonia) will be issued in the context of the ministerial dialogue meeting between the economics and finance ministers of the EU and the candidate countries in May 2007.

Croatia and Turkey present Pre-Accession Economic Programmes

Over the last months, some countries in the region have been affected by political turbulence. In Hungary, the sharp divide between the two main political camps has persisted. The governments of Poland and the Czech Republic are based on fragile coalitions. In Slovakia, the coalition has been stable, but continues to include two smaller parties from the fringes of the political spectrum. In Romania, the President of the Republic was impeached by parliament in mid-April 2007 after massive disputes between the President and the Prime Minister. The upcoming presidential and parliamentary elections in Turkey and Russia might also lead to some uncertainties. While these political jitters have not affected economic performance so far, they could easily put a drag on growth in the medium term.

Political noise across the region

Within the review period, Standard & Poor's upgraded Poland's long-term foreign-currency rating as economic growth gained momentum. Moody's, in turn, downgraded Hungary's rating. This step was motivated by the tense fiscal situation in the country, which is seen as a major challenge.

Upgrading of Poland, downgrading of Hungary

Table 4

Ratings of Sovereign Long-Term Foreign Currency-Denominated Debt

Currency	Moody's		Standard & Poor's	
	Current rating*	Last change (former rating)	Current rating**	Last change (former rating)
Slovenian tolar	Aa2	Jul 2006 (Aa3)	AA	May 2006 (AA-)
Bulgarian lev	Baa3	Mar 2006 (Ba1)	BBB+	Oct 2006 (BBB)
Czech koruna	A1	Nov 2002 (Baa1)	A-	Nov 1998 (A)
Hungarian forint	A2	Dec 2006 (A1)	BBB+	Jun 2006 (A-)
Polish zloty	A2	Nov 2002 (Baa1)	A-	Mar 2007 (BBB+)
Romanian leu	Baa3	Oct 2006 (Ba1)	BBB-	Sep 2005 (BB+)
Slovak koruna	A1	Oct 2006 (A2)	A	Dec 2005 (A-)
Croatian kuna	Baa3	Jan 1997	BBB	Dec 2004 (BBB-)
Turkish new lira	Ba3	Dec 2005 (B1)	BB-	Aug 2004 (B+)
Russian ruble	Baa2	Oct 2005 (Baa3)	BBB+	Sep 2006 (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 except for the best and worst category, with 1 being the best and 3 the worst subcategory.

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

¹⁵ Under Turkey's Stand-By Arrangement with the IMF, both parties reached an understanding that Turkey may maintain a primary surplus target of at least 6.5% of GNP through 2008.

Economic Outlook for Central and Eastern European Countries

The OeNB compiles semiannual forecasts of economic developments in Poland, Hungary, the Czech Republic as well as Russia. Taken together, the 3 EU Member States account for more than 60% of the 12 new EU Member States' overall GDP and are thus representative of trends in this EU region.¹

In the **three new EU Member States discussed** here, year-on-year real GDP growth in **2007** is predicted to accelerate slightly to 6% in Poland, while it will decelerate to about 5% in the Czech Republic and to below 3% in Hungary.

Three New EU Member States and Russia: Forecast of March 2007

Annual change at constant prices in %

GDP	2003	2004	2005	2006	2007 ¹	2008 ¹
Czech Republic	3.6	4.2	6.1	6.1	5.1	4.6
Hungary	4.1	4.9	4.2	3.9	2.7	3.0
Poland	3.9	5.3	3.5	5.8	6.0	5.5
Russia	7.4	7.1	6.4	6.7	6.4	6.0

Source: Eurostat, national statistical offices, OeNB, Suomen Pankki.

¹ Forecast.

In the **Czech Republic**, growth rates of (private and public) consumption and gross fixed capital formation will slow down slightly but remain at solid levels. Real income will continue to increase, while employment is expected to rise only moderately. There are signs of a slowdown in growth of consumer lending. Export and import growth rates will decline by around 4 percentage points. The contribution of net exports to GDP growth is expected to be about neutral.

In **Poland**, private consumption will go up on the back of high employment growth combined with high nominal wage growth. ULC and inflation are expected to increase only moderately, while credit growth will remain considerable. The growth of gross fixed capital formation will be supported by high profitability, conducive financing conditions and further improvements in the absorption of structural funds. Import growth is expected to slow down to a lesser extent than export growth, so that the negative contribution of net exports will increase. However, the positive evolution of domestic demand will more than compensate the negative contribution of net exports.

In **Hungary**, private and public consumption growth will decline, which is largely attributable to the fiscal consolidation program. Real net disposable income is expected to decrease, even assuming no significant moderation of gross nominal wages in the private sector. After declining in 2006, gross fixed capital formation growth is expected to recover marginally in 2007. The deceleration of export growth will be accompanied by a slowdown of import dynamics, especially as domestic demand continues to contract. The positive contribution of net exports to GDP growth will be somewhat higher than in 2006.

In **2008**, economic developments in the **Czech Republic** will essentially hinge on the extent to which the government will be able to push its reform package through parliament. Assuming full implementation, private consumption would be boosted by the planned reduction of income tax to 15%, but could be impaired by the intended increase of the VAT rate from 5% to 9% and by substantial cuts in social transfers. Gross fixed

¹ These forecasts are based on preliminary global growth projections and technical assumptions about oil prices and USD/EUR exchange rates, which are prepared by the ECB for the Eurosystem by means of broad macroeconomic projection exercises. These assumptions are central to the current outlook for two reasons: first, the sizeable export links of the three new EU countries with the euro area, and second, the fact that Russia is one of the world's largest oil-producing nations and that energy sources account for some 60% of the country's total exports. The forecast for Russia is prepared by the OeNB in collaboration with Suomen Pankki – Finlands bank.

capital formation will augment in particular owing to the construction of an automotive parts production plant. Exports and imports will continue to grow at roughly the same speed as in 2007.

In **Poland**, a moderate rise in ULC and a slight increase in inflation are expected to dampen private consumption. Employment growth is expected to slacken, and credit growth will be dampened slightly. Gross fixed capital formation will decrease owing to lower profitability, monetary tightening and a slower increase in the absorption of structural funds. Export growth will remain stable, while import growth will slow down, which will result in a less negative contribution of net exports to GDP growth.

Economic growth in **Hungary** is expected to pick up moderately in 2008. Private consumption will grow marginally as a result of a modest recovery of employment and the stabilization (or minor increase) of real wages. Public consumption will continue to decline, whereas gross fixed capital formation is expected to pick up. On the external side, export growth will moderate slightly despite some acceleration of euro area import demand. A modest increase of domestic demand will cause import growth to rise, so that the contribution of net exports is expected to be less positive than in 2006 and 2007.

Regarding possible sources of **risk** to these forecasts, sizeable deviations from the built-in assumptions for external factors are possible, e.g. for import growth of the countries' main trading partners and for oil price developments. Exchange rate developments represent a further risk factor to the forecasts. Additionally, some uncertainty remains about the implementation of fiscal reforms. In Poland, in particular, growth of domestic demand hinges upon solid further employment growth. However, there are some signs of labor shortage in the Polish economy which might have a moderating effect on domestic demand growth.

In **Russia**, the economy is projected to grow at a robust pace in **2007** and **2008**, largely due to high consumption and investment growth. Private consumption is expected to expand robustly owing to continued buoyant rises in real income and strong lending growth. Government consumption is expected to speed up further over the following two years. Gross fixed capital formation is predicted to continue growing strongly, driven by huge projects in the energy sector and increased public investment. Rapid economic growth and further real appreciation of the ruble will sustain strong import growth. Exports are expected to expand at approximately the same pace as in 2006.

Regarding **risk** factors for Russian growth, oil price developments remain the key factor, given the persisting dependence of the Russian economy on the extraction and export of raw materials. Another risk factor consists in the possibility of an excessively quick appreciation of the real exchange rate, triggered by accelerating inflows of energy proceeds and/or capital inflows. Such a quick appreciation could have repercussions for Russia's competitiveness, with the Dutch disease looming. Furthermore, political uncertainty brought on by elections to the lower house of parliament, the Duma, in late 2007 and the 2008 presidential election pose an additional risk to the projection.

2 Slovenia Successfully Completed the Euro Changeover

GDP growth strengthens ahead of euro adoption

Slovenia's GDP growth accelerated from 4% in 2005 to 5.2% in 2006, with economic activity being particularly strong in the second half of the year. Economic growth was driven by domestic demand. Real net exports made a small negative contribution to growth, after having been a strong growth-supporting factor in 2005. Within domestic demand, gross fixed capital formation posted the highest growth and provided the largest contribution to growth. Investment activity, which strengthened considerably in the second half of 2006, was strong in machinery and equipment as well as construction. It was supported by public investment in motorway construction, rapid and accelerating growth credit to households and enterprises (with real growth credit to the private sector edging up to almost 23% by end-2006), and possibly by the payroll tax cut in early 2006. Consumption growth was slightly stronger than in 2005 on account of strengthening public consumption, while private consumption increased at roughly the same rate as in 2005. Export growth remained stable in 2006 despite rather favorable external conditions, while import growth accelerated on the back of strong domestic demand.

Deficit on combined current and capital account widens, net FDI outflow continues

Slovenia's deficit on the combined current and capital account amounted to 3% of GDP, slightly up from 2005. This deficit stemmed primarily from the income balance, but also from the balance on goods and services, the transfer balance and the capital account. The widening of the deficit in 2006 was almost evenly attributable to the goods and services balance, the income balance and transfers. Slovenia registered larger net FDI outflows than in 2005, mainly on account of smaller FDI inflows into the country, while Slovenian companies continued to expand into neighboring countries.

Small inflationary effect of the euro changeover

Annual average inflation remained stable at 2.5% in 2006. Preventing inflation from accelerating after the euro changeover represented a major economic policy challenge around the turn of the year, given that the inflation rate had fluctuated between 1.5% and 3.4% year on year during the first three quarters. In fact, the Slovenian Statistical Office registered unusual systematic price increases in some goods and services categories (mainly in restaurants, bars, for personal services, furniture and textiles) in December 2006. These price increases contributed to the rise in the overall inflation rate from 2.4% in November to 3% in December and in the core inflation rate (excluding energy and unprocessed food prices) from 2% to 2.6%. Encouragingly, however, price pressures eased at the beginning of 2007, with inflation falling to 2.3% in February, before edging up again to 2.6% in March (owing to developments in energy and unprocessed food prices). According to preliminary information by Eurostat, the total impact of the euro changeover on consumer price inflation in Slovenia during and after the changeover period may have been around 0.3 percentage point. This is in line with the experience of the first-wave changeover. Given that "teuro"¹⁶ fears proved largely unfounded, inflation expectations – as measured by the European Commission's monthly consumer survey – also receded rapidly during the first quarter of 2007, thus almost fully reversing the sharp increase between mid-2005 and end-2006.

¹⁶ *Teuro* (a combination of "euro" and the German word for expensive, *teuer*) refers to the widely-held suspicion that many retailers took advantage of the introduction of the euro to push up prices.

Similarly, ULC growth (in the whole economy) decelerated to about 1% (preliminary data) in 2006 and consumption-driven inflationary factors were contained, which bodes well for the inflation outlook. At the same time, however, net real wage growth (in the whole economy) has accelerated since September 2006 (to 5.5% year on year in January 2007). This development needs to be monitored. According to Banka Slovenije's March 2007 projection, annual average inflation should climb to 2.7% in 2007 and remain at that level in 2008. Wage developments or a possible increase in VAT rates (to compensate for lower personal and corporate income tax revenues) are seen as the major country-specific upward risks to the forecast.

As a result of successful convergence over the past years, Slovenia joined the euro area at the beginning of 2007. With regard to monetary developments in the country, the final months of 2006 were characterized by a continued exchange rate stability against the euro and the convergence of short-term interest rates (long-term interest rates had converged to euro area levels significantly earlier). Interest rate convergence over the second half of 2006 was achieved as short-term interest rates in the euro area went up more pronouncedly than those in Slovenia. As a result, real interest rates (in ex-post terms) increased slightly in Slovenia, but this seems to have been insufficient to cool credit demand, as also evidenced by real growth of credit to the private sector picking up in 2006.

The budget deficit amounted to 1.4% of GDP in 2006, which was almost the same as in 2005 and slightly lower than predicted both in the European Commission's Autumn 2006 forecast and in Slovenia's 2006 December stability program (both 1.6%). The decline in the deficit ratio was supported by a strengthening of economic activity. However, the negative impact of the payroll tax cut on budget revenues may also have been counterbalanced by spending cuts. According to the stability program, the deficit ratio should stay at 1.5% and 1.6% of GDP in 2007 and 2008, respectively, before falling back to 1% in 2009. This means that consolidation is backloaded and is expected to result from a significant decrease in both revenue and expenditure ratios. Despite a more favorable macroeconomic outlook, the program envisages the 1% deficit target to be reached one year later than expected in the previous program. This delay is attributed to a major railway project, Slovenia's EU presidency in the first half of 2008 and to the country's entry into the Schengen area. In addition, the consolidation path will not meet the target set in the revised Stability and Growth Pact, which specifies an annual improvement in the structural balance by 0.5% of GDP for euro area and ERM II members until their medium-term budgetary objective is reached. As a result, the EU Council has urged Slovenia to take advantage of the favorable economic conditions, speed up the achievement of the medium-term budgetary objective and improve the long-term sustainability of public finances in particular by strengthening the ongoing pension reform with additional measures.

**Slovenia becomes
13th euro area member**

**Budget outcome proved
better than expected in
2006, but may
worsen in 2007**

Table 5

Main Economic Indicators: Slovenia									
	2004	2005	2006	Q3 2005	Q4 2005	Q1 2006	Q2 2006	Q3 2006	Q4 2006
Year-on-year change of period total in %									
GDP at constant prices	4.4	4.0	5.2	3.8	3.9	5.0	4.7	5.6	5.5
Private consumption	2.6	3.4	3.3	3.4	2.7	3.1	3.4	3.6	3.1
Public consumption	3.4	2.2	3.8	2.4	2.2	4.4	3.5	3.0	4.2
Gross fixed capital formation	7.9	1.5	11.9	-2.1	7.0	8.6	8.5	14.6	15.2
Exports of goods and services	12.5	10.5	10.0	10.7	10.9	14.9	9.4	6.9	9.5
Imports of goods and services	13.4	7.0	10.4	7.1	10.7	13.8	9.0	8.4	10.7
Contribution to GDP growth in percentage points									
Domestic demand	5.3	1.9	5.6	1.4	4.2	4.3	4.5	6.7	6.9
Net exports of goods and services	-0.9	2.0	-0.4	2.2	-0.3	0.6	0.2	-1.0	-1.4
Exports of goods and services	7.4	6.8	6.8	7.0	7.1	9.7	6.4	4.8	6.6
Imports of goods and services	8.3	4.8	7.2	4.8	7.4	9.1	6.2	5.9	8.0
Year-on-year change of period average in %									
Labor productivity of industry (real)	6.4	5.9	8.8	5.4	9.8	10.2	7.2	9.9	8.1
Gross average wage of industry (nominal)	7.1	5.8	5.5	5.3	5.9	6.5	5.8	4.3	5.4
ULC of industry (nominal)	0.7	-0.1	-3.1	-0.0	-3.5	-3.4	-1.3	-5.1	-2.5
PPI of industry	4.4	2.8	2.4	2.0	1.8	1.6	2.4	2.8	2.7
CPI (here: HICP)	3.7	2.5	2.5	2.3	2.6	2.3	3.1	2.5	2.3
EUR per 1 SIT, + = SIT appreciation	-2.2	-0.2	-0.0	0.2	0.1	0.1	-0.0	-0.1	-0.1
Period average levels									
Unemployment rate (ILO definition, %, 15-64 years)	6.5	6.7	6.1	6.5	7.4	7.0	6.0	5.7	5.7
Employment rate (15-64 years)	65.3	66.0	66.6	66.6	66.0	65.9	67.1	67.2	66.1
Key interest rate p. a. (%)	4.6	4.0	3.5	4.0	4.0	3.8	3.5	3.4	3.5
SIT per 1 EUR	239.1	239.6	239.6	239.5	239.5	239.5	239.6	239.6	239.6
Nominal year-on-year change of period average stock in %									
Broad money (including foreign currency deposits) ¹	5.1	6.6	8.3	5.0	7.1	8.0	9.3	7.9	8.2
Contributions to year-on-year change of broad money in percentage points									
Net foreign assets of the banking system	-8.1	-10.4	-15.6	-10.0	-10.1	-14.5	-15.2	-16.2	-16.3
Domestic credit of the banking system	14.0	19.7	27.1	18.9	21.3	24.3	25.5	28.3	29.9
of which:									
claims on the private sector	11.5	16.6	26.8	16.8	18.3	23.8	26.4	27.3	29.6
claims on households	2.7	4.4	7.0	4.5	4.9	6.3	7.1	7.2	7.5
claims on enterprises	8.8	12.3	19.8	12.2	13.4	17.5	19.3	20.1	22.1
claims on the public sector (net)	2.4	3.0	0.3	2.2	3.0	0.6	-0.8	1.1	0.4
Other domestic assets (net) of the banking system	-0.8	-2.7	-3.2	-3.9	-4.0	-1.8	-1.1	-4.3	-5.5
% of GDP (ESA 95)									
General government revenues	45.1	45.6	44.8	..	..	..	..	..	..
General government expenditures	47.4	47.0	46.3	..	..	..	..	..	..
General government balance	-2.3	-1.5	-1.4	..	..	..	..	..	..
Primary balance	-0.5	0.2	0.2	..	..	..	..	..	..
Gross public debt	28.9	28.4	27.8	..	..	..	..	..	..
Year-on-year change of period total (based on EUR) in %									
Merchandise exports	13.3	12.9	16.4	11.0	12.1	19.4	13.9	15.8	16.7
Merchandise imports	16.6	12.1	15.9	12.4	15.3	19.3	14.1	15.2	15.1
% of GDP (based on EUR), period total									
Trade balance	-3.8	-3.7	-3.7	-3.4	-7.3	-3.0	-1.5	-3.4	-7.0
Services balance	2.6	3.1	2.9	3.4	3.5	3.0	3.3	2.8	2.4
Income balance (factor services balance)	-1.2	-1.0	-1.2	-0.9	-1.4	-1.1	-1.0	-1.2	-1.3
Current transfers	-0.3	-0.3	-0.6	0.1	-0.4	-1.3	-0.1	-1.0	0.0
Current account balance	-2.7	-2.0	-2.6	-0.9	-5.6	-2.4	0.7	-2.8	-5.9
Capital account balance	-0.4	-0.4	-0.4	-0.3	-0.8	-0.1	-0.3	-0.4	-0.7
FDI (net)	0.9	-0.2	-1.0	0.0	1.6	-0.9	-0.8	0.0	-2.4
% of GDP (rolling four-quarter GDP, based on EUR), end of period									
Gross external debt	58.5	71.0	80.3	67.6	71.0	75.9	78.2	78.4	80.3
Gross official reserves (excluding gold)	24.6	24.7	18.0	24.9	24.7	24.4	22.7	19.9	18.0
Months of imports of goods and services									
Gross official reserves (excluding gold)	4.8	4.6	3.1	4.7	4.6	4.4	4.0	3.5	3.1
EUR million, period total									
GDP at current prices	26,230	27,634	29,742	7,006	7,081	6,848	7,632	7,590	7,671

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

¹ The methodology for calculating broad money and its components was changed for data as of January 2005 (thus affecting year-on-year rates as of January 2006).

3 Bulgaria: Alongside Strong Growth, External Imbalances Deepen despite Rising Fiscal Surpluses

Real GDP in Bulgaria grew by 6.1% in 2006, mainly driven by robust private consumption and buoyant gross fixed capital formation as well as supported by an expansion of credit to households and companies. Real growth of credit to the private sector came to around 17% at end-2006, which was slower than a year earlier but still fairly vibrant.¹⁷ Export growth decelerated considerably in the second half of 2006, while imports continued to grow strongly. Thus, the negative contribution of net exports to GDP growth rose to almost 10 percentage points for full-year 2006. Positively, imports mainly consisted of investment goods and intermediate goods, thus supporting the industrial sector.

Strong economic growth continues to bear fruit for the labor market. Compared with 2005, employment increased by 4.2% in 2006, whereas the annual unemployment rate (ILO definition) declined to 9% in 2006. In addition to growing labor utilization, Bulgaria's labor productivity in industry improved substantially, almost fully offsetting nominal wage growth. Bulgaria has been pursuing prudent wage policies for some years, with a view to preserving international competitiveness.

In the context of the currency board arrangement which has been in place for ten years, sustaining a sound competitive position is crucial for taming external vulnerabilities. This is particularly important as the combined current and capital account deficit is expected to widen to 15% of GDP in 2006. The high external deficit is essentially fueled by a large trade deficit. As in previous years, the external deficit was fully covered by net FDI inflows, which amounted to 16% of GDP. While becoming more concentrated, net FDI grew by 50% in 2006 compared with 2005. At end-2006, industry accounted for 29% in the total FDI stock, the financial intermediation sector for 18% and real estate and construction (which grew fast in 2005 and 2006) for 23%. Bulgaria's net foreign debt-to-GDP ratio has been broadly stable over the past few years, amounting to 11.6% of GDP at end-2006. However, this aggregate picture conceals a significant increase in the private sector's net foreign debt, as banks have increasingly refinanced domestic lending through foreign funds and also nonbanks have increasingly reverted to direct borrowing abroad. This rise was compensated by a substantial improvement in the public sector's net foreign position (build-up of central bank reserves). It is noteworthy that net foreign debt is much lower than gross foreign debt (76.5% of GDP), mainly because of high central bank reserves and, to some extent, because of commercial banks' asset holdings abroad.

Average HICP inflation increased to 7.4% in 2006. This rise was caused by higher oil prices and a substantial increase in excise duties as part of a frontloaded harmonization with EU tax rates and administered prices. The HICP inflation rate dropped to 4.5% in February and March 2007. Apart from base effects, lower energy prices, a moderation of food prices and possibly the entry into the Single Market have had dampening effects on inflation. Bulgaria's

Domestic demand continues to drive strong economic growth

Robust wage growth largely offset by productivity improvements

Combined current and capital account deficit deteriorates further, but is fully covered by net FDI inflows

Annual inflation rate peaked in 2006 but dropped in February and March 2007

¹⁷ A sectoral disaggregation of gross fixed capital formation, which would shed further light on the most actively investing branches, is not yet available for 2006.

Table 6

Main Economic Indicators: Bulgaria									
	2004	2005	2006	Q3 2005	Q4 2005	Q1 2006	Q2 2006	Q3 2006	Q4 2006
Year-on-year change of period total in %									
GDP at constant prices	6.6	6.2	6.1	5.4	6.0	5.5	6.4	6.7	5.7
Individual consumption	4.9	7.4	7.4	9.4	7.1	5.4	7.4	7.4	7.4
Collective consumption	6.7	2.2	2.2	4.3	-4.7	0.1	1.2	1.2	1.2
Gross fixed capital formation	13.5	23.3	17.6	28.4	25.9	17.1	16.0	11.1	23.8
Exports of goods and services	12.7	8.5	9.0	2.0	10.7	12.7	10.0	8.4	5.4
Imports of goods and services	15.7	13.1	15.2	17.0	12.9	20.8	12.2	14.7	14.0
Contribution to GDP growth in percentage points									
Domestic demand	11.0	13.0	15.4	18.3	11.5	19.4	12.8	13.8	16.5
Net exports of goods and services	-4.3	-6.8	-9.3	-12.9	-5.5	-13.9	-6.4	-7.1	-10.8
Exports of goods and services	9.2	6.4	6.9	1.7	7.1	9.4	8.5	6.9	3.7
Imports of goods and services	13.6	13.2	16.2	14.6	12.5	23.4	14.8	14.0	14.5
Year-on-year change of period average in %									
Labor productivity of industry (real)	15.2	3.4	8.2	2.3	6.7	10.1	8.5	9.0	5.0
Gross average wage of industry (nominal)	6.3	8.1	10.8	8.5	9.2	9.4	9.4	11.7	12.7
ULC of industry (nominal)	-7.8	4.6	2.5	6.1	2.4	-0.6	0.8	2.5	7.3
PPI of industry	5.9	7.0	9.4	6.7	7.9	8.4	10.0	10.7	8.3
CPI (here: HICP)	6.1	6.0	7.4	6.9	7.8	8.7	8.6	6.7	5.7
EUR per 1 SIT, + = SIT appreciation	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Period average levels									
Unemployment rate (ILO definition, %, 15-64 years)	12.2	10.2	9.0	9.3	10.0	9.8	9.0	8.9	8.4
Employment rate (15-64 years)	54.2	55.8	58.6	57.9	56.0	55.5	59.1	60.3	59.8
Key interest rate p. a. (%)	2.6	2.1	2.6	2.0	2.0	2.2	2.5	2.7	3.1
SIT per 1 EUR	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Nominal year-on-year change of period average stock in %									
Broad money (including foreign currency deposits)	22.3	27.3	21.3	27.1	26.5	19.2	17.0	22.3	26.1
Contributions to year-on-year change of broad money in percentage points									
Net foreign assets of the banking system	4.4	8.9	14.7	11.3	8.6	8.3	10.7	16.0	22.6
Domestic credit of the banking system	21.8	25.8	13.0	23.6	26.0	18.5	12.7	12.2	9.4
of which:									
claims on the private sector	26.3	27.9	16.4	25.0	23.6	17.9	12.6	17.3	17.7
claims on households	10.0	13.0	9.4	13.1	13.1	11.7	9.2	8.8	8.3
claims on enterprises	16.3	14.9	7.0	11.9	10.5	6.2	3.5	8.5	9.4
claims on the public sector (net)	-4.5	-2.1	-3.4	-1.4	2.4	0.6	0.0	-5.2	-8.3
Other domestic assets (net) of the banking system	-3.8	-7.4	-6.4	-7.8	-8.2	-7.6	-6.4	-5.9	-5.9
% of GDP (ESA 95)									
General government revenues	41.4	41.4	39.9	..	..	..	..	..	..
General government expenditures	39.3	39.5	36.6	..	..	..	..	..	..
General government balance	2.2	1.9	3.3	..	..	..	..	..	..
Primary balance	4.0	3.4	4.6	..	..	..	..	..	..
Gross public debt	37.9	29.2	22.8	..	..	..	..	..	..
Year-on-year change of period total (based on EUR) in %									
Merchandise exports	19.7	18.6	26.6	10.6	21.9	28.4	31.8	32.1	15.6
Merchandise imports	20.3	26.9	25.2	32.6	26.2	33.0	21.9	25.8	22.1
% of GDP (based on EUR), period total									
Trade balance	-14.9	-20.2	-21.5	-19.2	-22.8	-20.6	-19.3	-18.9	-26.5
Services balance	3.3	3.7	2.9	11.6	-1.8	-3.5	3.5	10.9	-1.1
Income balance (factor services balance)	1.2	0.7	0.2	0.6	0.2	0.3	0.7	-0.3	0.0
Current transfers	3.7	3.7	2.6	3.4	3.8	2.3	2.6	3.2	2.2
Current account balance	-6.6	-12.0	-15.8	-3.6	-20.7	-21.4	-12.5	-5.1	-25.4
Capital account balance	0.8	1.0	0.7	1.2	1.1	0.4	0.8	0.7	0.9
FDI (net)	11.3	14.5	15.9	20.2	12.1	15.0	20.5	11.6	16.9
% of GDP (rolling four-quarter GDP, based on EUR), end of period									
Gross external debt	63.3	69.1	76.5	66.9	69.1	71.6	74.1	77.5	76.5
Gross official reserves (excluding gold)	32.4	31.1	33.1	31.9	31.1	28.6	31.3	32.5	33.1
Months of imports of goods and services									
Gross official reserves (excluding gold)	5.7	4.9	4.8	5.2	4.9	4.3	4.7	4.8	4.8
EUR million, period total									
GDP at current prices	19,874	21,882	25,100	6,097	6,064	5,102	5,954	7,026	7,018

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

convergence program projects the HICP to decrease to 4% in 2007 and to 3% in 2008.

Growth of domestic credit to the private sector decelerated in 2006, but still remained dynamic and even somewhat higher than the Bulgarian National Bank (BNB) had originally projected. Lending growth to households roughly halved in the course of 2006, apparently owing to prudential and administrative measures. At the same time, cross-border lending of enterprises and inter-company loans expanded remarkably by 76% and 37%, respectively. From January 2007, the BNB lifted the quantitative restrictions on credit growth, partly owing to the success achieved in slowing credit growth and partly because enterprises had increasingly turned to less easily traceable sources of credit (leasing companies, retailers and intercompany loans). Prudential regulation (e.g. risk weights and loan-to-value ratios) remains strict, aiming to contain annual bank credit growth to the private sector in 2007 to 20%.

Bulgaria is retaining the monetary integration strategy it adopted in 2004. The country intends to apply for ERM II membership in 2007 and to fulfil the convergence criteria in the medium term so as to qualify for euro area entry between 2010 and 2012.

The general government surplus increased further and reached 3.3% of GDP in 2006. This improvement against 2005 stemmed from a considerable reduction in expenditures (–3% of GDP) which was not fully matched by a decrease in revenues. Bulgaria's convergence program contained a surplus target of 0.8% of GDP for 2007, but in view of the high current account deficit, the Bulgarian government recently agreed with the IMF on a revised fiscal surplus target of 2.3% of GDP for 2007. To put this target into perspective, it is worth noting that EU accession increases budget expenditures (membership contributions, co-financing needs). According to the IMF, the World Bank and the European Commission, Bulgaria will have to further improve the efficiency of public spending, in particular in the health care, pension and education systems. According to the EU Council's opinion on Bulgaria's convergence program, the country's medium-term budgetary position is sound. At the same time, the EU Council calls on Bulgaria to maintain a high degree of fiscal prudence to preserve stability and contain external imbalances.

4 Czech Republic: Strong Growth Continues but Appears to Have Passed Its Peak

In 2006, GDP growth in the Czech Republic continued to be robust at 6.1%, the same pace as in 2005. Output expansion peaked in the first quarter of 2006 but has slowed down a bit since. In addition, the sources of growth have changed significantly. While net foreign trade was the dominant driver in 2005, contributing more than two-thirds to GDP growth, its impact was weaker but still substantial in the first quarter of 2006. From then on, however, the contribution of net foreign trade has faded into insignificance, as import growth gathered speed in the wake of strengthening domestic demand and high energy prices. Hence, the overall contribution of net exports virtually disappeared in 2006 and the economy accelerated solely on the back of domestic demand. This surge in domestic demand can be ascribed to all its

Credit growth decelerated but is still dynamic, BNB lifts quantitative restrictions

Monetary integration plans

Fiscal surplus outperforms expectations in 2006

Domestic demand replaces net exports as the main driver of growth

components except public consumption which, owing to base effects, increased only barely (purchase of military aircraft in 2005). By contrast, private consumption posted one of the highest growth rates ever. The contribution of gross fixed investment was only slightly lower, also taking off compared with 2005 – a development which was chiefly attributable to investment in means of transport. Household consumption benefited from higher employment and real disposable incomes, while household and corporate demand was fueled by the continued fast real expansion of credit to the private sector (+18% by end-2006). Swelling inventories made up one-third of GDP growth.

Labor market improves

As a consequence of robust growth, unemployment declined in the course of 2006. This development was potentially also supported by the fact that (nominal) ULC in industry fell for the fourth year in a row as labor productivity increased at a robust pace. Nominal industrial wage growth picked up in 2006, but so did productivity growth.

Combined capital and current account balance deteriorates despite a higher trade surplus

As in 2005, the balance of foreign trade in goods and services displayed a surplus in 2006. In line with earlier years, trade in vehicles and machines contributed most to this result, particularly owing to production increases at the country's major car producers Škoda Auto and TPCA.¹⁸ By contrast, the deficit on the income account, which was chiefly ascribable to high profits of foreign-owned companies, grew further and came to more than 6% of GDP. For that reason, the combined current and capital account deficit (as a percentage of GDP) more than doubled compared with 2005. The financing need was covered by capital inflows, the lion's share of which stemmed from net FDI inflows.

Inflation easing again?

The HICP rose moderately in 2006 to an annual average of slightly more than 2%. The pressure on prices was a bit more pronounced in the first three quarters of the year, when the HICP hovered around 2.5%, particularly owing to high energy prices (until late summer) and adjustments in administered prices. In the fourth quarter of 2006, however, inflation dropped considerably, but started to pick up again from the very low levels recorded in late 2006, reaching 2.1% in March 2007. In the latter part of 2006, the declining oil price was a main driving force behind inflation relief. Moreover, throughout the year, inflation performance was supported by the nominal appreciation of the Czech koruna against the euro. Since mid-2006, the Czech currency has gained some 1.7% vis-à-vis the euro: Appreciation came to 3.5% in the second half of 2006, but some of the earlier gains have been reversed in the first months of 2007. The CPI, the actual target index of Česká národní banka (ČNB) – which has, on average, been some 0.2 to 0.3 percentage point higher than the HICP since 2003 – crept up to 2.6% in 2006. Hence, it finished within the target range of 3% (± 1 percentage point) that was introduced in January 2006.¹⁹ For December 2007, the ČNB forecasts inflation to range between 2.4% and 3.8%. According to the ČNB, major country-specific downside risks to this forecast are a stonger-than-expected exchange rate as well as the lower-than-expected inflation over the past months. Upside risks

¹⁸ Joint car production plant by Toyota, Peugeot and Citroën in Kolín.

¹⁹ The main reasons for this discrepancy are (1) different weights used in the indices, (2) the treatment of purchases of goods by foreigners and (3) the treatment of imputed rents.

Table 7

Main Economic Indicators: Czech Republic

	2004	2005	2006	Q3 2005	Q4 2005	Q1 2006	Q2 2006	Q3 2006	Q4 2006
Year-on-year change of period total in %									
GDP at constant prices	4.2	6.1	6.1	6.0	6.7	6.4	6.2	5.9	5.8
Private consumption	2.6	2.8	4.6	3.1	3.0	4.1	4.3	4.4	5.4
Public consumption	-3.2	1.0	0.3	4.9	-0.1	2.4	-1.9	-1.8	2.6
Gross fixed capital formation	4.7	1.3	7.3	1.7	3.2	6.8	7.0	8.0	7.6
Exports of goods and services	21.1	10.4	14.6	10.6	10.1	18.4	10.9	11.7	17.4
Imports of goods and services	18.2	4.8	14.2	5.9	4.9	16.4	11.3	10.9	18.1
Contribution to GDP growth in percentage points									
Domestic demand	3.5	1.7	6.0	2.5	2.5	4.7	6.6	5.5	7.0
Net exports of goods and services	0.7	4.4	0.1	3.5	4.2	1.7	-0.4	0.4	-1.2
Exports of goods and services	15.0	8.6	12.6	8.6	8.7	15.6	9.4	9.9	15.5
Imports of goods and services	14.3	4.2	12.5	5.1	4.6	14.0	9.8	9.5	16.7
Year-on-year change of period average in %									
Labor productivity of industry (real)	9.4	6.8	8.6	7.8	8.2	12.9	7.1	7.0	7.6
Gross average wage of industry (nominal)	7.1	4.6	6.8	5.0	4.3	6.3	6.5	7.5	6.8
ULC of industry (nominal)	-2.1	-2.1	-1.7	-2.6	-3.6	-5.8	-0.5	0.5	-0.8
PPI of industry	5.7	3.0	1.6	1.4	0.0	0.3	1.3	2.5	2.2
CPI (here: HICP)	2.6	1.6	2.1	1.6	2.2	2.4	2.5	2.4	1.1
EUR per 1 SIT, + = SIT appreciation	-0.2	7.1	5.1	6.4	6.2	4.9	6.2	4.8	4.5
Period average levels									
Unemployment rate (ILO definition, %, 15-64 years)	8.4	8.0	7.2	7.8	7.8	8.0	7.1	7.1	6.6
Employment rate (15-64 years)	64.2	64.8	65.3	65.2	65.2	64.8	65.3	65.4	65.6
Key interest rate p. a. (%)	2.2	2.0	2.2	1.8	2.0	2.0	2.0	2.3	2.5
SIT per 1 EUR	31.9	29.8	28.3	29.7	29.3	28.6	28.4	28.3	28.0
Nominal year-on-year change of period average stock in %									
Broad money (including foreign currency deposits)	10.3	6.4	12.6	6.2	8.1	12.5	12.2	12.8	12.8
Contributions to year-on-year change of broad money in percentage points									
Net foreign assets of the banking system	2.9	5.2	1.2	7.9	9.5	11.4	3.1	-4.2	-4.6
Domestic credit of the banking system	7.1	0.7	9.3	-1.0	0.9	3.0	6.5	13.0	14.3
of which:									
<i>claims on the private sector</i>	6.0	8.6	11.9	9.3	10.0	11.5	11.8	12.1	12.1
<i>claims on households</i>	4.4	5.4	6.7	5.6	6.0	6.5	6.5	6.8	6.9
<i>claims on enterprises</i>	1.5	3.2	5.2	3.8	4.1	5.0	5.3	5.3	5.3
<i>claims on the public sector (net)</i>	1.2	-7.9	-2.6	-10.4	-9.1	-8.5	-5.3	0.9	2.1
Other domestic assets (net) of the banking system	0.3	0.5	2.0	-0.6	-2.4	-1.9	2.6	4.0	3.2
% of GDP (ESA 95)									
General government revenues	41.5	40.4	39.5	..	..	..	..	..	..
General government expenditures	44.4	44.0	42.5	..	..	..	..	..	..
General government balance	-2.9	-3.5	-2.9	..	..	..	..	..	..
Primary balance	-1.7	-2.4	-1.8	..	..	..	..	..	..
Gross public debt	30.7	30.4	30.4	..	..	..	..	..	..
Year-on-year change of period total (based on EUR) in %									
Merchandise exports	25.6	16.5	20.0	15.1	15.5	23.0	17.5	17.3	22.0
Merchandise imports	21.4	12.3	19.9	13.1	12.7	24.0	19.4	15.9	20.6
% of GDP (based on EUR), period total									
Trade balance	-1.0	1.3	1.5	-0.1	0.1	3.6	0.9	0.6	0.9
Services balance	0.4	0.7	0.4	0.9	0.3	0.1	0.4	0.8	0.3
Income balance (factor services balance)	-5.7	-4.8	-6.3	-4.9	-3.7	-3.5	-7.4	-6.9	-7.1
Current transfers	0.2	0.7	-0.3	0.1	0.7	0.0	-0.3	-0.4	-0.5
Current account balance	-6.1	-2.1	-4.7	-4.1	-2.7	0.3	-6.3	-5.9	-6.4
Capital account balance	-0.5	0.2	0.3	0.0	0.3	0.3	-0.2	0.3	0.7
FDI (net)	3.6	8.1	3.9	5.7	4.3	2.5	3.3	4.8	4.8
% of GDP (rolling four-quarter GDP, based on EUR), end of period									
Gross external debt	38.1	39.5	39.1	39.3	39.5	37.6	38.3	38.3	39.1
Gross official reserves (excluding gold)	23.8	24.9	20.9	25.5	24.9	23.7	22.4	22.0	20.9
Months of imports of goods and services									
Gross official reserves (excluding gold)	4.0	4.3	3.4	4.4	4.3	4.0	3.7	3.7	3.4
EUR million, period total									
GDP at current prices	87,285	99,767	113,100	25,268	26,409	25,787	28,658	28,725	29,930

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

are the ongoing strong economic performance, and possibly, as suggested by the experience of the mid-1990s, rent deregulation (which was reimplemented at the beginning of 2007). The key interest rate has stayed at 2.5% since September 2006. In reaction to the fact that the target year for euro adoption was deferred from 2010 to an unspecified later date,²⁰ the ČNB has recently announced a new, lower inflation target which is supposed to better reflect the long-term development of the Czech economy. Effective from January 2010, the target for CPI growth will thus be 2% (± 1 percentage point).

**Fiscal balance remains
a problem spot**

Owing to robust economic growth, the general government deficit improved somewhat in 2006 to 2.9% of GDP. A more marked improvement was hindered by tax cuts and increased social spending. For 2007, a substantially higher deficit is expected (4% of GDP) primarily owing to higher social transfers, which are ascribable to a legislation package that was approved before the 2006 elections. The latest update of the convergence program (released in March 2007), which does not touch upon the long-debated necessary reforms of the pension, health care and social transfer systems, foresees a reduction of the deficit to 3.5% in 2008 and to 3.2% in 2009. However, now that the political deadlock after the 2006 elections, which lasted for almost eight months, has been overcome at last, it seems that the new coalition government is determined to accelerate the process of fiscal consolidation. It recently put forward a reform package whose main objective is to slow down growth in mandatory expenditures. The intended measures contain, inter alia, some cuts of social transfers, some parametric changes in the pension system and a removal of most automatic indexation schemes. On the revenue side, the government proposes the introduction of a flat personal income tax, successive reductions of the corporate income tax and an increase in the VAT rate. These adjustments of the tax system are to lead to slightly higher revenues in 2008. However, from 2009 on, the tax cuts are supposed to outweigh the higher VAT revenues, as the government expects changes in the trend and quality of mandatory expenditures to allow a gradual reduction of the tax burden without infringing on deficit targets. Owing to the fact that the government relies on the support by opposition members of parliament, the presented measures are not overly ambitious and it remains to be seen in which form the proposed package will eventually be passed by parliament, if at all.

5 Hungary: Fiscal Tightening Has Taken Its Toll

**Domestic demand
contracts in 2006**

Annual average GDP growth in Hungary slowed only modestly to 3.9% in 2006 compared with 2005. However, output dynamics weakened significantly in the course of the year. Net real exports were the driving force behind growth in 2006, as export growth accelerated on the back of stronger demand in Hungary's major export markets. Import growth accelerated at a slower pace owing to weaker domestic demand than in 2005. This slowdown in domestic demand was mainly attributable to a decrease in investment activity, with construction and investment in machinery and equipment being affected in similar ways. Encouragingly, however, the magnitude of contraction in the latter area became smaller toward the end of 2006. Domestic consumption

²⁰ See Focus on European Economic Integration 2/06.

posted a minor plus for full-year 2006, but its growth rate gradually slowed in the course of the year and was negative in the fourth quarter. This development was ascribable to the contraction of public consumption on the back of the government's fiscal consolidation efforts and the slowing of private consumption, especially in the final quarter of 2006, as real wage growth slumped amid rising inflation and growth of credit to the private sector (in real terms) decelerated by almost 6 percentage points to below 10% year on year.

The 2006 general government budget deficit came in at 9.2% of GDP.²¹ This result was much higher than originally planned (partly for technical and accounting reasons), but slightly below the revised expectations of 10.1% of GDP. Consolidation measures that took effect in the fall of 2006 are estimated to have helped reduce the deficit ratio by about 1.5 percentage points. Structural reforms are being implemented in public administration and in the health care, pension and education systems, with recent changes mainly focusing on the health care sector. In its December 2006 update of the convergence program, the Hungarian government envisages a deficit reduction to 6.8% of GDP in 2007, but according to the finance ministry's latest projections, the deficit may come in somewhat lower (6.6% of GDP), given higher tax revenues and lower debt servicing costs. In subsequent years, the deficit is to be lowered further to reach 2.7% by 2010. Thus, fiscal adjustment is frontloaded and is to be achieved primarily through a reduction in the expenditure ratio. According to the EU Council's assessment, the program is broadly consistent with the targeted correction of the excessive deficit by 2009, and thus in line with the extended deadline set by the EU Council in October 2006. According to the European Commission, risks to the budgetary outcome are represented by somewhat optimistic macroeconomic projections for 2009, by uncertainty surrounding (1) the enforcement of expenditure freezes in 2007 and 2008, (2) the effectiveness of new fiscal rules and the strengthened institutional framework of public finances and (3) the specification and implementation of structural reform steps in public administration and in the health care, pension and education systems.

Compared with 2005, the deficit of the combined current and capital account fell by 1 percentage point to slightly above 5% of GDP in 2006. At the same time, however, the negative net errors and omissions position rose by almost the same amount (to 3% of GDP in 2006 from 2.1% in 2005), which may imply that imports are still to some extent underregistered. The improvement in the combined current and capital account stemmed from a significant narrowing of the deficit during the second half of the year, reflecting fiscal and monetary tightening and favorable export conditions. The goods and services balance showed a small surplus (for the first time since 1997), despite a further deterioration in the terms of trade. The transfer balance also recorded a small surplus. Thus, the deficit of the combined current and capital account was attributable to the income deficit, which even rose against 2005. Slightly more than one-half of the combined current and capital account deficit was

Government finances on a consolidation path

Deficit on combined current and capital account narrows

²¹ About 1.5% of GDP stemmed from the net costs of the 1998 pension reform which established, inter alia, an obligatory funded pillar.

Main Economic Indicators: Hungary

	2004	2005	2006	Q3 2005	Q4 2005	Q1 2006	Q2 2006	Q3 2006	Q4 2006
Year-on-year change of period total in %									
GDP at constant prices	4.9	4.2	3.9	4.3	4.8	4.9	3.8	3.8	3.2
Private consumption	3.1	3.9	1.6	2.3	5.6	2.7	2.0	1.7	0.0
Public consumption	1.9	1.9	-2.6	1.3	1.8	-1.6	-1.8	-4.2	-3.0
Gross fixed capital formation	7.7	5.6	-1.8	7.2	2.3	10.2	-3.3	-4.1	-4.6
Exports of goods and services	15.7	11.6	18.0	12.4	12.5	18.5	15.9	17.3	20.1
Imports of goods and services	14.1	6.8	12.6	9.1	8.4	15.7	9.7	10.7	14.7
Contribution to GDP growth in percentage points									
Domestic demand	4.5	0.7	-0.6	2.0	1.7	2.8	-1.6	-1.7	-1.5
Net exports of goods and services	0.4	3.6	4.5	2.2	3.0	2.2	5.4	5.5	4.7
Exports of goods and services	11.9	9.7	16.1	10.2	10.4	16.7	14.3	15.3	18.0
Imports of goods and services	11.6	6.1	11.6	8.0	7.4	14.5	8.9	9.7	13.3
Year-on-year change of period average in %									
Labor productivity of industry (real)	9.7	10.1	11.7	12.3	10.6	16.3	8.6	11.3	10.6
Gross average wage of industry (nominal)	10.0	7.2	8.5	6.7	7.0	8.3	7.7	8.5	9.3
ULC of industry (nominal)	0.3	-2.6	-2.9	-5.0	-3.3	-6.9	-0.8	-2.6	-1.2
PPI of industry	3.6	2.9	6.7	2.6	4.0	4.9	6.5	9.7	5.9
CPI (here: HICP)	6.8	3.5	4.0	3.5	3.2	2.4	2.7	4.6	6.4
EUR per 1 SIT, + = SIT appreciation	0.7	1.5	-6.1	1.3	-2.3	-3.8	-6.4	-10.8	-3.2
Period average levels									
Unemployment rate (ILO definition, %, 15-64 years)	6.1	7.2	7.5	7.3	7.3	7.7	7.2	7.5	7.5
Employment rate (15-64 years)	56.8	56.9	57.3	57.3	57.1	56.7	57.3	57.6	57.6
Key interest rate p. a. (%)	11.4	7.1	6.8	6.5	6.0	6.0	6.0	7.0	8.0
SIT per 1 EUR	251.7	248.0	264.3	245.6	251.8	254.6	266.8	275.4	260.3
Nominal year-on-year change of period average stock in %									
Broad money (including foreign currency deposits)	11.8	13.8	16.0	14.0	14.4	16.6	16.4	17.0	14.3
Contributions to year-on-year change of broad money in percentage points									
Net foreign assets of the banking system	-1.9	0.6	-2.3	3.1	-0.7	0.0	-1.5	-4.7	-2.7
Domestic credit of the banking system	17.9	15.3	23.6	12.4	17.3	19.1	22.1	29.4	23.4
of which:									
claims on the private sector	21.6	16.6	21.7	14.9	17.7	19.1	21.3	25.8	20.6
claims on households	9.8	7.3	9.4	7.3	8.1	8.5	9.4	10.4	9.2
claims on enterprises	11.8	9.3	12.3	7.6	9.7	10.6	11.9	15.3	11.3
claims on the public sector (net)	-3.8	-1.3	1.9	-2.5	-0.4	0.0	0.9	3.7	2.8
Other domestic assets (net) of the banking system	-4.2	-2.0	-5.3	-1.5	-2.2	-2.5	-4.3	-7.7	-6.4
% of GDP (ESA 95)									
General government revenues ¹	42.5	42.2	43.7	..	..	..	..	..	..
General government expenditures ¹	48.9	50.0	53.0	..	..	..	..	..	..
General government balance ¹	-6.5	-7.8	-9.2	..	..	..	..	..	..
Primary balance ¹	-2.1	-3.7	-5.3	..	..	..	..	..	..
Gross public debt ¹	59.4	61.7	66.0	..	..	..	..	..	..
Year-on-year change of period total (based on EUR) in %									
Merchandise exports	18.1	11.9	16.6	12.4	11.8	19.3	14.1	14.7	18.1
Merchandise imports	15.8	9.2	14.1	13.0	11.2	20.0	11.7	10.9	14.3
% of GDP (based on EUR), period total									
Trade balance	-3.0	-1.7	-0.5	-3.0	-1.4	-1.4	0.0	-1.3	0.6
Services balance	0.3	0.8	1.1	1.2	0.4	0.2	1.3	1.9	1.1
Income balance (factor services balance)	-6.1	-6.3	-6.8	-5.9	-5.8	-6.9	-8.2	-6.2	-6.3
Current transfers	0.3	0.2	0.3	-0.3	0.8	1.0	-0.1	0.4	0.1
Current account balance	-8.5	-6.9	-5.8	-8.1	-6.0	-7.1	-7.0	-5.2	-4.4
Capital account balance	0.3	0.8	0.8	0.3	1.2	0.6	0.2	0.9	1.4
FDI (net)	3.4	4.8	2.7	3.2	10.3	8.7	0.5	5.1	-2.3
% of GDP (rolling four-quarter GDP, based on EUR), end of period									
Gross external debt	67.8	75.4	92.3	74.3	75.4	82.3	84.2	87.7	92.3
Gross official reserves (excluding gold)	14.4	17.8	18.4	16.7	17.8	20.2	18.9	19.0	18.4
Months of imports of goods and services									
Gross official reserves (excluding gold)	2.5	3.1	2.9	2.9	3.1	3.4	3.1	3.0	2.9
EUR million, period total									
GDP at current prices	81,283	87,869	88,908	22,897	23,314	20,423	21,048	22,200	25,238

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

¹ Including net costs of pension reform.

financed by net FDI inflows, which were relatively large (albeit smaller than in 2006, when they were boosted by a large one-off deal). FDI outflows gathered pace in 2006.²²

Inflation in Hungary has accelerated significantly since mid-2006, with the year-on-year HICP hitting 9% in February and March 2007. Inflation pressures increased despite weak consumption and the loosening of labor market conditions and were mainly attributable to fiscal policy measures (VAT rate hike, regulated price increases, changes in price subsidy systems) and large increases in unprocessed food prices. In addition, the hefty acceleration of nominal wage growth in the private sector and the sharp increase in inflation expectations may well have contributed to inflation as well. Looking forward, Magyar Nemzeti Bank (MNB) expects inflation to gradually decelerate from the second quarter of 2007 to reach 5% by the fourth quarter of 2007 and 3% (i.e. the MNB's inflation target) by the second half of 2008. According to the MNB, the major risk to this projection are exchange rate and oil price developments (two-sided risk), wage effects of increased inflation expectations (predominantly upward risk), increases in the regulated gas price (downward risk) and the disinflationary effect of the slowdown of domestic consumption (two-sided risk). In addition, the magnitude of consumption smoothing by households in reaction to the fiscal tightening measures is also surrounded by uncertainty.

In response to the acceleration of inflation and the changes to the inflation outlook, the MNB hiked its policy rate by a total of 200 basis points over the second half of 2006.²³ The policy rate had been kept unchanged at 8% since October 2006 as the Monetary Council took a wait-and-see approach to assess the inflationary effect of the fiscal consolidation measures (notably the development of inflation expectations, wage developments and the (dis)inflationary effect of the expected slowdown of domestic demand). Against the backdrop of increased confidence of market participants in the government's fiscal policy and structural reforms, the widening of the interest rate differential against the euro (as MNB rates rose more strongly than ECB rates) and the improved climate on the international financial markets after some turbulence in May and June 2006, the Hungarian forint has strongly recovered since mid-2006, appreciating by around 13% until mid-April 2007.

Inflation cycle nearing the top

Policy rate hikes in the summer and fall of 2006 underpin Hungarian forint

6 Poland: Strong Productivity Rise alongside Growing Employment

Real GDP growth in Poland averaged 5.8% in 2006 and accelerated throughout the year. Domestic demand was supported by an expansion of bank lending to the private sector, which came to more than 20% in real terms by end-2006. Private consumption growth in 2006 was much higher than in 2005, but still remained somewhat below total GDP growth, keeping a steady pace throughout the year. Employment and wage growth as well as credit growth underpinned the expansion of private consumption and residential investment. Gross fixed

Growth, in particular investment, boosts employment; consumption growth buoyant but still below GDP growth

²² Net portfolio capital inflows were substantial, while the net inflow of other capital decreased significantly compared with previous years, mainly on account of increased investment by Hungarians abroad.

²³ See also Focus on European Economic Integration 2/06.

capital formation growth was very dynamic and gained momentum in the course of the year (approaching +20% in the second half of 2006). This was ascribable to growing EU transfers, high profitability and credit expansion to corporates as well as robust consumer and external demand. It is worth noting that manufacturing, at 72%, accounted for the lion's share in total investment outlays. In 2006 as a whole, the contribution of private consumption and gross fixed capital formation to GDP was roughly equal (about 3 percentage points each), while in the fourth quarter of 2006, the contribution of the latter was substantially higher owing to intra-year dynamics. As a result of the strong rise in total demand, real import growth was brisk in 2006 and slightly exceeded real export growth (which was also robust), thus implying a marginally negative contribution of net exports to GDP growth.

With the economy in full swing, annual employment growth in the whole economy accelerated strongly in 2006. This was the main reason why the unemployment rate (ILO definition) was by 4.5 percentage points lower in the third quarter than in 2005. About 1 percentage point of this total decline is attributable to emigration and the growing number of students, which reduced the participation rate. In parallel, nominal average wage growth picked up in 2006 and further quickened at the beginning of 2007. As production increased strongly, labor productivity in industry advanced markedly despite high employment growth. The increase in labor productivity more than offset high wage rises so that nominal ULC in industry declined not only in 2006, but also in early 2007. Looking forward, further accelerating wage growth, in particular in combination with currency appreciation, may pose a challenge for the external balance.

Goods and services deficit still remarkably low, but income deficit higher

In 2006, as in previous years, the income balance was the main reason why the combined current and capital account deficit was only moderate. The deficit in the goods and services balance remained small and widened only marginally in the first months of 2007, as import growth declined more sharply than export growth despite the strong pick-up in domestic demand. In these months, like in 2006, net FDI inflows more than compensated the current account deficit. In 2006, no major changes occurred in total gross external debt and gross official reserves, while the gradual reduction of public gross external debt continued.

Thanks to a productivity rise, inflation remains low despite supply-side shocks

Both annual headline HICP and national CPI inflation stood at only 1.3% in the fourth quarter of 2006. Annual inflation quickened in early 2007, coming to 2.4% (HICP) and 2.5% (national CPI), respectively, in March. This acceleration was almost exclusively ascribable to the drought-related rise in agricultural prices and hikes in electricity and gas prices for households. Annual inflation (as measured by the HICP excluding unprocessed food and energy and by national net CPI inflation) increased from 1.0% and 1.5%, respectively, in the fourth quarter of 2006 to 1.2% and 1.7%, respectively, in March 2007. Low inflation dynamics are partly attributable to ULC developments in the tradable sector. So far, only few signs of demand-side inflationary pressures have become discernible.

According to the April 2007 inflation report of Narodowy Bank Polski (NBP), inflation is projected to decline to 2% in the fourth quarter of 2007, to remain below the inflation target of 2.5% (as measured by the national CPI)

Table 9

Main Economic Indicators: Poland

	2004	2005	2006	Q3 2005	Q4 2005	Q1 2006	Q2 2006	Q3 2006	Q4 2006
Year-on-year change of period total in %									
GDP at constant prices	5.3	3.5	5.8	4.1	4.5	5.2	5.5	5.8	6.4
Private consumption (excl. NPISH)	4.3	1.9	5.2	2.2	2.6	5.2	4.9	5.5	5.1
Public consumption (incl. NPISH)	3.1	5.3	2.4	4.6	7.8	4.6	1.5	1.1	2.5
Gross fixed capital formation	6.4	6.5	16.7	6.4	10.1	7.7	14.8	19.8	19.3
Exports of goods and services	14.0	8.0	15.1	6.1	12.1	22.0	12.6	14.8	12.2
Imports of goods and services	15.2	4.7	15.4	1.5	15.0	20.9	10.7	15.3	15.5
Contribution to GDP growth in percentage points									
Domestic demand	6.1	2.4	5.9	2.4	5.6	4.8	4.8	6.1	7.7
Net exports of goods and services	-0.8	1.1	-0.2	1.8	-1.1	0.4	0.6	-0.3	-1.2
Exports of goods and services	4.7	3.0	5.6	2.4	4.4	7.7	4.9	5.6	4.5
Imports of goods and services	5.5	1.9	5.8	0.6	5.5	7.2	4.2	5.9	5.7
Year-on-year change of period average in %									
Labor productivity of industry (real)	13.5	2.9	9.5	3.3	7.2	10.4	10.2	9.9	7.7
Gross average wage of industry (nominal)	4.5	3.2	5.2	3.2	4.4	4.3	4.9	6.0	5.5
ULC of industry (nominal)	-7.9	0.3	-4.0	-0.1	-2.6	-5.5	-4.8	-3.5	-2.0
PPI of industry	7.1	0.7	2.2	-0.2	-0.4	0.6	2.3	3.4	2.6
CPI (here: HICP)	3.6	2.2	1.3	1.8	1.2	0.9	1.4	1.5	1.3
EUR per 1 SIT, + = SIT appreciation	-2.9	12.6	3.2	10.1	8.1	5.0	4.6	1.6	1.8
Period average levels									
Unemployment rate (ILO definition, %, 15-64 years)	19.3	18.0	14.1	17.6	17.0	16.3	14.3	13.2	12.4
Employment rate (15-64 years)	51.7	52.8	54.5	53.7	53.7	52.6	53.9	55.6	55.7
Key interest rate p. a. (%)	5.8	5.3	4.1	4.8	4.5	4.3	4.0	4.0	4.0
SIT per 1 EUR	4.5	4.0	3.9	4.0	3.9	3.8	3.9	4.0	3.8
Nominal year-on-year change of period average stock in %									
Broad money (including foreign currency deposits)	6.9	11.8	11.9	12.2	12.1	10.9	10.2	12.8	13.7
Contributions to year-on-year change of broad money in percentage points									
Net foreign assets of the banking system	4.2	5.0	0.7	6.6	7.4	5.8	1.5	-1.8	-2.4
Domestic credit of the banking system	3.5	5.3	12.4	5.5	5.5	7.5	8.6	15.3	17.8
of which:									
claims on the private sector	4.0	5.6	11.2	7.1	6.7	8.9	8.9	12.1	14.6
claims on households	4.6	5.8	8.9	6.4	6.0	7.6	7.5	9.6	10.6
claims on enterprises	-0.6	-0.1	2.3	0.7	0.7	1.4	1.4	2.5	4.0
claims on the public sector (net)	-0.5	-0.3	1.2	-1.5	-1.2	-1.5	-0.2	3.2	3.2
Other domestic assets (net) of the banking system	-0.8	1.5	-1.2	0.1	-0.8	-2.3	0.0	-0.7	-1.7
% of GDP (ESA 95)									
General government revenues ¹	36.9	39.0	39.4	..	..	..	..	..	..
General government expenditures ¹	42.6	43.4	43.3	..	..	..	..	..	..
General government balance ¹	-5.7	-4.3	-3.9	..	..	..	..	..	..
Primary balance ¹	-2.9	-1.5	-1.5	..	..	..	..	..	..
Gross public debt ¹	45.7	47.1	47.8	..	..	..	..	..	..
Year-on-year change of period total (based on EUR) in %									
Merchandise exports	22	17	21	14	18.3	23.5	20.3	22.1	19.5
Merchandise imports	20	13	23	10	17.2	23.3	19.4	24.2	23.1
% of GDP (based on EUR), period total									
Trade balance	-2.2	-1.0	-1.4	-1.0	-1.1	-0.6	-1.0	-1.8	-2.2
Services balance	0.4	0.6	0.7	0.2	0.7	0.4	0.5	0.7	0.9
Income balance (factor services balance)	-4.5	-3.5	-3.9	-3.3	-3.5	-3.2	-4.5	-3.7	-4.3
Current transfers	2.2	2.3	2.4	2.5	1.6	1.1	3.0	3.4	2.1
Current account balance	-4.1	-1.6	-2.3	-1.5	-2.3	-2.2	-2.0	-1.5	-3.4
Capital account balance	0.4	0.3	0.6	0.2	0.3	0.6	0.3	0.8	0.8
FDI (net)	4.6	2.2	2.9	2.8	1.4	5.4	2.6	2.3	1.6
% of GDP (rolling four-quarter GDP, based on EUR), end of period									
Gross external debt	46	46	47	46	46	46	46	47	47
Gross official reserves (excluding gold)	13	14	13	14	14	14	14	14	13
Months of imports of goods and services									
Gross official reserves (excluding gold)	3.9	4.6	3.8	4.5	4.6	4.4	4.2	4.2	3.8
EUR million, period total									
GDP at current prices	204,878	244,121	269,874	59,963	69,880	62,815	63,760	65,410	77,889

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

¹ Including net costs of pension reform.

until mid-2008 and then to gradually approach 3.5% (the upper tolerance limit for deviations from the inflation target) at the end of the projection horizon. The report mentioned primarily food prices and, in addition, energy prices (crude oil and fuel) and the exchange rate as major sources of uncertainty attached to its projection. Against this inflation outlook, the NBP raised its key interest rate by 25 basis points on April 25, 2007. This interest rate move came after a period of more than one year in which the Monetary Policy Council had maintained the main policy rate at 4%, which implied that the interest rate differential to the euro area decreased over this period. This, in turn, helped reduce currency appreciation in the course of 2006 and early 2007.²⁴ After the most recent interest rate move, short-term real interest rates in ex-post terms²⁵ stood at somewhat above 2%.

Fiscal policy does not envisage expenditure cuts before 2008

The public deficit in 2006 came to 3.9% of GDP,²⁶ which was lower than the original target of 4.6% (January 2006 update of the convergence program). Compared with 2005, the deficit declined somewhat, mainly as a result of growth-related higher revenues. The expenditure-to-GDP ratio was essentially stable owing to a boost in public investment expenditure, which stemmed mainly from the national co-financing requirements of EU-funded projects.

The updated convergence program of November 2006 envisages the public deficit to amount to 3.4% of GDP in 2007. This implies a further decline in the deficit by one-half percentage point compared with the final 2006 outcome. However, the deficit reduction envisaged in the convergence program is exclusively revenue-based, while the expenditure-to-GDP ratio is planned to remain roughly unchanged. Thus, in 2007, the chance to implement an expenditure reform in the context of countercyclical fiscal policy will probably be missed. Only for 2008 and 2009 does the program envisage a substantial decline in the expenditure ratio, combined with a lower revenue ratio and a further decline in the public deficit to about 3% of GDP. In its opinion on this convergence program, the EU Council concludes that it does not take sufficient action to achieve the envisaged correction of the excessive deficit by 2007 and that the planned measures should be strengthened to achieve this objective. For 2008 and 2009, the EU Council considers the envisaged progress to be appropriate, but sees considerable risks to the achievement of the budgetary targets, inter alia owing to a lack of information on the measures supporting the envisaged expenditure restraint. These measures, according to the EU Council, appear to be in an early conceptual phase.

7 Romania: Large Rise of the Current Account Deficit and Loosening of Fiscal Policy

Strong economic growth driven by buoyant domestic demand

At 7.6% in 2006, real GDP growth (year on year) in Romania was considerably stronger than in 2005. Economic activity peaked in the third quarter, with growth rates almost four times higher than in the same period of 2005, when the economy was hit hard by floods. Domestic demand expanded rapidly, thus

²⁴ From mid-2006 to mid-April 2007, the Polish currency strengthened by around 5.6% against the euro.

²⁵ As measured by the CPI-deflated key interest rate per month compounded over the past 12 months.

²⁶ The net costs of the 1999 pension reform establishing an obligatory funded pillar amounted to 2% of GDP in 2006.

being an even stronger driver of GDP growth than in 2005. Private consumption was backed by private credit and wage growth. Real credit to the private sector expanded strongly (by about 47% year on year at end-2006), as did real wages particularly in the public sector. According to the IMF, the public sector wage sum increased by about 27% in 2006 (in real terms).²⁷ Growth of gross fixed capital formation outpaced growth of private consumption. Investment grew particularly strongly in the fields of new construction, equipment and means of transport, profiting from the imminent EU accession that induced gross FDI inflows and from reconstruction work after the floods. Furthermore, stock changes added more than 2 percentage points to GDP growth in 2006. On the external side, the picture was less favorable. Export growth picked up slightly, but import growth rose much faster, supported by strong domestic demand and the continued real appreciation of the currency. The negative contribution of net exports to GDP growth increased further and reached almost double-digit levels in percentage points of GDP in 2006.

In late 2006, nominal ULC in the industry started to rise dynamically, as a sharp increase in nominal wages outpaced productivity developments, even though industrial productivity growth was strong owing to continued industrial restructuring supported by large gross FDI inflows. Public-sector wages are scheduled to rise by 14% to 19% in 2007, and as of January 2007, the minimum wage was hiked by 18%, suggesting that high wage dynamics will persist in 2007.

Strong domestic demand triggered a further widening of the trade balance, leading to a double-digit combined current and capital account deficit in 2006. In the first months of 2007, the trade balance deteriorated further on the back of a significant rise in import growth that was probably ascribable to the abolition of customs duties after EU accession. Most of the current account deficit (around 90%) was covered by net FDI inflows, which reached a record level in 2006. These substantial inflows were partly attributable to the acquisition of the majority stake in Romania's largest commercial bank, BCR, by the Austrian Erste Bank in 2005. The major part of the payment was due in 2006 (EUR 2.2 billion of a total of EUR 3.75 billion) and naturally boosted FDI. Up to now, the lion's share of FDI was channeled into takeover projects, not greenfield investments. Looking forward, it remains to be seen how dynamic gross FDI inflows will be in the coming years, as no further large-scale privatization projects are on the agenda. Interestingly, almost 40% of FDI (based on stock figures at end-2005) went into the manufacturing sector, i.e. toward export-oriented production facilities where firms have taken advantage of low labor costs. Banking and insurance as well as retail and wholesale trade each made up around 15% of the country's FDI stock. Here, the main motive of foreign activity might be to attain access to the Romanian market.

Inflation rates reached a historical low at below 4% in February and March 2007. Price increases declined mainly owing to lower food prices, a slowdown in price increases of administered goods and services, the abolition of customs

**Unit labor costs
on the rise**

**External disequilibria
are widening further**

Inflation hits record low

²⁷ In addition, private consumption was fueled by remittances from Romanians working abroad.

Table 10

Main Economic Indicators: Romania

	2004	2005	2006	Q3 2005	Q4 2005	Q1 2006	Q2 2006	Q3 2006	Q4 2006
Year-on-year change of period total in %									
GDP at constant prices	8.4	4.1	7.6	2.4	4.2	6.7	7.7	8.2	7.6
Private consumption	14.6	9.7	13.9	10.3	6.1	11.9	13.9	15.3	13.8
Public consumption	-4.3	8.5	2.5	8.0	10.4	3.3	0.7	1.3	4.1
Gross fixed capital formation	11.1	12.6	16.1	10.6	21.0	11.2	14.4	17.3	18.0
Exports of goods and services	13.9	8.1	10.6	9.7	10.1	12.9	10.5	10.6	8.6
Imports of goods and services	22.1	16.6	22.9	16.7	16.7	21.9	19.1	24.7	25.5
Contribution to GDP growth in percentage points									
Domestic demand	14.0	10.1	17.5	7.5	8.9	15.4	16.6	18.7	18.4
Net exports of goods and services	-5.6	-6.0	-9.9	-5.1	-4.7	-8.7	-8.9	-10.5	-10.9
Exports of goods and services	5.5	3.4	4.6	3.7	3.4	7.0	5.1	4.3	3.1
Imports of goods and services	11.1	9.4	14.5	8.8	8.1	15.7	14.0	14.8	13.9
Year-on-year change of period average in %									
Labor productivity of industry (real)	7.1	4.4	11.3	2.8	6.5	9.0	13.7	11.8	10.7
Gross average wage of industry (nominal)	23.0	16.8	15.7	17.0	18.1	16.6	14.3	15.0	16.8
ULC of industry (nominal)	14.8	11.9	4.0	13.9	10.9	7.0	0.5	2.9	5.5
PPI of industry	19.1	10.8	11.7	9.0	9.1	11.2	11.9	12.8	11.1
CPI (here: HICP)	11.9	9.1	6.6	9.0	8.5	8.7	7.2	5.9	4.8
EUR per 1 SIT, + = SIT appreciation	-7.3	11.8	2.7	16.3	9.5	4.0	2.9	-0.5	4.6
Period average levels									
Unemployment rate (ILO definition, %, 15-64 years)	8.5	7.5	..	6.5	7.2	8.1	7.4	7.4	..
Employment rate (15-64 years)	57.7	57.6	..	57.8	57.2	57.2	59.6	60.9	..
Key interest rate p. a. (%)	20.4	10.0	8.4	8.0	7.7	7.7	8.5	8.8	8.8
SIT per 1 EUR	4.1	3.6	3.5	3.5	3.6	3.6	3.5	3.5	3.5
Nominal year-on-year change of period average stock in %									
Money plus quasi-money	32.6	48.3	23.3	48.8	38.3	23.5	23.5	18.6	27.7
Contributions to year-on-year change of broad money in percentage points									
Net foreign assets of the banking system	3.5	8.3	-11.3	6.9	-1.9	-17.8	-18.2	-6.2	-4.5
Domestic credit of the banking system	25.0	20.4	28.3	19.4	25.0	24.7	26.7	29.9	31.1
of which:									
claims on the private sector	27.6	22.8	29.5	22.5	26.0	25.5	28.1	30.8	32.9
claims on households	11.3	11.3	15.4	12.0	13.6	12.8	14.4	16.4	17.7
claims on enterprises	16.3	11.6	14.1	10.4	12.4	12.7	13.7	14.5	15.2
claims on the public sector (net)	-2.6	-2.4	-1.3	-3.1	-1.0	-0.9	-1.4	-0.9	-1.8
Other domestic assets (net) of the banking system	4.2	19.6	6.3	22.6	15.2	16.7	15.0	-5.1	1.2
% of GDP (ESA 95)									
General government revenues	31.1	32.4	30.1	..	..	..	..	..	..
General government expenditures	32.6	33.7	32.0	..	..	..	..	..	..
General government balance	-1.5	-1.4	-1.9	..	..	..	..	..	..
Primary balance	-0.1	-0.3	-1.1	..	..	..	..	..	..
Gross public debt	18.8	15.8	12.4	..	..	..	..	..	..
Year-on-year change of period total (based on EUR) in %									
Merchandise exports	21.3	17.5	16.2	19.7	17.2	22.0	18.9	8.9	15.9
Merchandise imports	24.0	23.9	25.1	25.2	24.4	28.6	23.3	22.3	26.6
% of GDP (based on EUR), period total									
Trade balance	-8.7	-9.8	-12.1	-7.8	-11.5	-9.9	-12.6	-11.2	-13.6
Services balance	-0.3	-0.4	0.0	0.1	-0.7	0.1	1.0	0.2	-0.9
Income balance (factor services balance)	-4.2	-2.9	-3.1	-3.5	-1.1	-3.7	-4.0	-2.9	-2.4
Current transfers	4.9	4.5	4.9	4.1	4.4	4.2	4.4	3.8	6.6
Current account balance	-8.4	-8.6	-10.3	-7.0	-8.9	-9.3	-11.2	-10.1	-10.3
Capital account balance	0.8	0.7	0.0	0.5	1.0	0.7	-2.4	0.3	0.9
FDI (net)	8.4	6.6	9.3	7.7	5.8	10.3	6.8	7.0	12.3
% of GDP (rolling four-quarter GDP, based on EUR), end of period									
Gross external debt ¹	29.7	30.7	28.5	30.9	30.7	29.8	29.0	28.6	28.5
Gross official reserves (excluding gold)	17.8	21.1	21.9	22.4	21.1	21.9	20.9	20.6	21.9
Months of imports of goods and services									
Gross official reserves (excluding gold)	4.8	5.8	5.9	6.2	5.8	6.0	5.7	5.6	5.9
EUR million, period total									
GDP at current prices	60,917	79,704	97,297	22,456	25,881	17,113	21,599	26,257	32,329

Source: Bloomberg, European Commission, Eurostat, IMF, national statistical offices, NCBs, wiiv, OeNB.

¹ Only medium- and long-term debt.

duties (related to EU accession), stronger competition in the retail sector and the nominal appreciation of the Romanian leu. However, the downward movement of the core inflation rate (excluding administered prices and goods with volatile prices) came to an end at the beginning of 2007. Last year, the inflation target of 5% (± 1 percentage point) was reached, with year-on-year inflation just below 5% in December. Banca Națională a României (BNR) has set its 2007 year-end inflation target to 4% (± 1 percentage point). In its most recent inflation report, the BNR estimates that the inflation rate will reach 4.6% at end-2007. After two policy rate hikes in 2006, the first quarter of 2007 marked a turning point in interest rate policy: The BNR cut its monetary policy rate in two steps from 8.75% to 7.5%. This rate cut was largely motivated by the continuous appreciation pressure on the currency and further progress with disinflation. According to the BNR, there is a certain danger that inflation could pick up, given the risk of dynamic wage growth and a relaxation of fiscal policy over the coming months. Furthermore, with effect from January 2007, the BNR removed some limits on foreign currency-denominated loans. These limits had been introduced in September 2005, restricting credit institutions' exposure to a maximum of 300% of their own funds when granting foreign currency loans to unhedged borrowers.

Against the background of strong economic growth and rising external imbalances, special attention has been paid to fiscal policy. The 2006 budget deficit reached 1.9% of GDP, which is less than the revised target of 2.5% of GDP, but much higher than the original target of 0.5% of GDP. In fact, until November 2006, the budget balance showed a surplus of more than 1% of GDP, mainly owing to expenditure restraints. In December 2006, however, a marked spending spree took place. This expenditure boom was related to infrastructure projects and the building up of capacities to handle EU funds (where efficiency improvements regarding absorption and management are still needed) as well as extra-wage payments in the public sector. In 2005, Romania launched a fundamental tax reform comprising the implementation of a flat tax on personal income, a broadening of the tax base and improvements in tax collection. Despite lower tax rates, the revenue-to-GDP ratio increased in 2005 but fell back considerably in 2006. For 2007, the Romanian government targets a deficit of 2.8% of GDP (partly owing to additional spending related to EU membership). Until 2009, the deficit is planned to be reduced to 2% of GDP. In its assessment of Romania's convergence program, the EU Council criticized the procyclical nature of fiscal policy and indicated that the progress made to achieve Romania's medium-term budget objective is insufficient and backloaded. The IMF is also critical about Romania's fiscal policy: For 2007, the IMF expects a deficit of 3.7% of GDP, arguing that budget revenue estimations are overly optimistic while expenditures do not fully take account of planned salary hikes in the public sector. Dynamic economic growth alongside a further deterioration of the current account and the risk of increasing inflation certainly calls for a more ambitious and stability-oriented fiscal policy that would dampen domestic demand and help contain external imbalances.

Fiscal loosening in the last month of 2006

8 Slovakia: Strong External Performance despite Appreciating Currency

Accelerating growth driven by exports

The Slovak economy showed a very dynamic growth performance in 2006 at +8.3%. The pick-up of economic activity, which was particularly buoyant in the second half of 2006, has to be attributed to a strong export performance which was achieved alongside an appreciating currency. While import growth in 2006 remained broadly unchanged, exports gained significant momentum. The dynamic performance of net exports made up for a slowdown in investment spending, which still remained at robust levels thanks to strong profits and FDI inflows.²⁸ Private consumption benefited from an improvement of the labor market situation, real wage growth and the rather swift real growth of private sector credit (+20% at end-2006). After a strong expansion before the June 2006 general elections, public consumption returned to significantly lower levels toward the end of the year.

Labor market improvement on the back of strong growth

Even though the unemployment rate in Slovakia is still among the highest in the EU, growth is increasingly feeding through to the labor market. In February 2007, the unemployment rate declined further to 11%. Average employment growth came to 4% in 2006. Despite the sharp decline in unemployment, nominal wage growth (in industry) was on average lower than productivity advances, causing nominal ULC to fall. High and, to a considerable extent, FDI-driven productivity developments in industry also played a role.

Strong industrial performance bolsters the external sector

Over the past few years some large FDI projects have tangibly increased the productive capacity of the Slovak economy. Industrial output increased by almost 10% in 2006. Owing to the favorable competitive position of Slovak companies, industrial sales to foreign markets grew more than three times faster than domestic sales in 2006. This development also helped contain the trade deficit and the evolution of the current account. In 2006, the deficit of the combined current and capital account decreased marginally to 8.4% of GDP. This figure has to be interpreted against the background of strong growth and high investment demand. 80% of the current account deficit was covered by net FDI inflows in 2006. In addition to the trade deficit, the income balance deficit – driven by high profits of foreign-owned firms – contributes significantly to the current account imbalance. This development was also observed in other new EU Member States. In January 2007, the trade balance went into surplus. Two large foreign companies in the motor industry started production in Slovakia in 2006. As a result, exports in the category “vehicles, aircraft, vessels and associated transport equipment” performed strongly throughout 2006 and even doubled in January 2007 against the corresponding month of 2006.

Falling energy prices ease inflationary pressure

Price developments in the second half of 2006 and in early 2007 were favorable. Inflation decreased from levels around 5% in summer 2006 to 2.1% in March 2007, with declining energy prices and nominal appreciation being the main driving forces. Moreover, added restraint on administered price adjustments (in particular in the category “housing, water, electricity, gas and

²⁸ In the first half of 2006, gross fixed capital formation grew strongly in the sectors metal products and machinery as well as transport equipment, whereas in the second half of 2006 the construction sector saw high investment growth.

other fuels”) moderated inflation in the first quarter of 2007. According to the latest forecast of Národná banka Slovenska (NBS), the inflation rate is expected to decrease to 1.5% by end-2007. This would imply that the inflation target of below 2% for December 2007 will be met. Apart from global factors (especially oil prices), the NBS sees various domestic risks to its forecast, in particular with regard to food price developments and the evolution of services prices (possible secondary effects of earlier increases in regulated prices and knock-on effects on higher-than-expected domestic demand).

In the second half of 2006, the Slovak koruna recovered from its temporary weakness following the appointment of a new government in summer, and appreciated strongly on the back of significant capital inflows, growth acceleration and renewed confidence in economic policies. Despite foreign exchange interventions by the NBS to contain appreciation pressures, the currency traded nearly 12% above its ERM II central rate by mid-March. On March 16, 2007, the central parity of the Slovak koruna against the euro in ERM II was revalued by 8.5%, which was justified by improvements in underlying fundamentals. Upon this realignment, the currency initially strengthened further so that the NBS intervened repeatedly. Moreover, the central bank reduced its key interest rate by 25 basis points both on March 27 and April 24, 2007. The rate cuts were motivated by declining inflation and the absence of demand-pull inflation pressures. This move helped stabilize the exchange rate at around 5½% to 6% above its new ERM II parity. Overall, the Slovak koruna appreciated by about 13% vis-à-vis the euro between mid-2006 and mid-April 2007. With a view to the size of the realignment in March 2007, it seems that a sizeable part of this appreciation can be explained by an enhanced economic performance, while some part was ascribable to market sentiment.

Revaluation of the central parity of the Slovak koruna

At 3.4% of GDP²⁹ the 2006 general government deficit was lower than the originally targeted 4.2% of GDP. This can be traced back to strong growth performance, positive labor market developments and lower-than-expected interest expenditure and pension reform costs. The deficit reduction was achieved despite a selective, but overall moderate, relaxation of earlier reform steps, thus implying some additional spending and some revenue reduction. The deficit target is 2.9% of GDP for 2007, and by 2009, the deficit should be below 2% of GDP. This reduction against 2006 is to be reached mainly via expenditure restraints on public-sector wages, social benefit payments (helped by a smaller number of beneficiaries) and capital expenditure. It is worth noting that the budgetary forecast is based on high GDP growth assumptions of the Ministry of Finance (7.1%, but still lower than the NBS's expectations of 8.6%). According to the European Commission, this year's budget is consistent with the planned correction of the excessive deficit by 2007. However, progress toward meeting the medium-term budgetary objective is seen as limited. The European Commission therefore recommends strengthening structural adjustments in the fiscal sphere to speed up progress toward the medium-term objective.

Budget deficit under control thanks to brisk economic activity

²⁹ The net costs of the 2005 pension reform, which established inter alia an obligatory funded pillar, amounted to 1.1% of GDP in 2006 (about one-half percentage point higher than in 2005).

Table 11

Main Economic Indicators: Slovakia

	2004	2005	2006	Q3 2005	Q4 2005	Q1 2006	Q2 2006	Q3 2006	Q4 2006
Year-on-year change of period total in %									
GDP at constant prices	5.4	6.0	8.3	6.3	7.5	6.7	6.7	9.8	9.6
Private consumption	4.2	7.0	6.1	7.5	6.4	6.5	5.7	6.3	6.0
Public consumption	2.0	-0.6	4.1	2.2	-2.2	7.8	6.6	1.2	2.3
Gross fixed capital formation	5.0	17.5	7.3	21.0	24.4	13.8	3.6	6.7	7.0
Exports of goods and services	7.9	13.8	20.7	19.5	16.6	17.7	18.1	23.8	22.6
Imports of goods and services	8.8	16.6	17.8	17.7	21.7	19.6	14.0	22.9	15.3
Contribution to GDP growth in percentage points									
Domestic demand	6.3	8.8	6.5	5.4	13.1	8.6	3.8	9.5	4.4
Net exports of goods and services	-0.9	-2.8	1.7	0.8	-5.7	-1.9	2.9	0.3	5.2
Exports of goods and services	6.4	11.5	18.5	15.3	14.5	15.3	15.9	21.0	21.4
Imports of goods and services	7.3	14.2	16.8	14.5	20.2	17.2	13.0	20.7	16.2
Year-on-year change of period average in %									
Labor productivity of industry (real)	3.9	0.6	11.3	1.6	3.9	10.6	10.9	12.7	11.0
Gross average wage of industry (nominal)	10.1	7.3	6.7	4.9	6.8	2.4	8.2	7.4	8.5
ULC of industry (nominal)	6.0	6.6	-4.1	3.2	2.8	-7.4	-2.4	-4.7	-2.2
PPI of industry	3.4	4.7	8.4	5.6	6.7	9.5	9.6	8.5	6.1
CPI (here: HICP)	7.5	2.8	4.3	2.2	3.7	4.2	4.6	4.8	3.5
EUR per 1 SIT, + = SIT appreciation	3.6	3.7	3.7	3.5	2.5	2.2	3.3	2.2	7.1
Period average levels									
Unemployment rate (ILO definition, %, 15-64 years)	18.3	16.3	13.4	15.7	15.4	15.0	13.6	12.9	12.1
Employment rate (15-64 years)	57.0	57.7	59.4	58.0	58.5	58.3	59.3	59.9	60.2
Key interest rate p. a. (%)	4.9	3.2	4.0	3.0	3.0	3.1	3.8	4.5	4.8
SIT per 1 EUR	40.0	38.6	37.2	38.7	38.5	37.5	37.7	37.8	35.9
Nominal year-on-year change of period average stock in %									
Broad money (including foreign currency deposits)	4.0	5.0	5.5	4.5	4.3	2.2	4.5	6.7	8.6
Contributions to year-on-year change of broad money in percentage points									
Net foreign assets of the banking system	-2.6	-5.8	15.9	-8.5	-7.9	8.1	16.6	20.8	18.2
Domestic credit of the banking system	10.2	12.0	3.9	12.2	13.6	3.9	4.4	4.0	3.5
of which:									
claims on the private sector	4.0	8.0	16.0	9.3	11.4	15.2	16.6	15.8	16.5
claims on households	4.0	5.3	8.7	5.5	6.1	8.0	8.9	9.0	9.0
claims on enterprises	0.0	2.8	7.3	3.8	5.4	7.2	7.8	6.8	7.5
claims on the public sector (net)	6.1	4.0	-12.1	2.9	2.2	-11.3	-12.2	-11.9	-13.0
Other domestic assets (net) of the banking system	-3.6	-1.3	-14.3	0.8	-1.4	-9.7	-16.5	-18.1	-13.0
% of GDP (ESA 95)									
General government revenues ¹	35.3	35.2	33.9	..	..	..	..	..	..
General government expenditures ¹	37.7	38.1	37.3	..	..	..	..	..	..
General government balance ¹	-2.4	-2.8	-3.4	..	..	..	..	..	..
Primary balance ¹	-0.2	-1.3	-2.0	..	..	..	..	..	..
Gross public debt ¹	41.5	34.5	30.7	..	..	..	..	..	..
Year-on-year change of period total (based on EUR) in %									
Merchandise exports	14.9	15.6	29.6	19.6	22.0	27.9	25.3	29.7	34.5
Merchandise imports	17.9	17.9	29.3	14.3	26.1	30.7	25.6	33.7	27.7
% of GDP (based on EUR), period total									
Trade balance	-3.7	-5.2	-5.6	-2.1	-9.4	-6.2	-5.6	-4.7	-6.0
Services balance	0.6	0.7	1.2	1.0	0.3	1.2	0.9	1.3	1.4
Income balance (factor services balance)	-5.2	-4.2	-3.8	-3.4	-6.1	-1.2	-6.0	-5.9	-1.9
Current transfers	0.4	0.0	-0.1	-0.3	0.2	-0.1	1.1	-1.1	-0.3
Current account balance	-7.9	-8.7	-8.3	-4.7	-15.1	-6.3	-9.6	-10.3	-6.9
Capital account balance	0.3	0.0	-0.1	0.0	-0.1	-0.1	0.0	-0.1	-0.1
FDI (net)	7.3	4.1	6.9	2.9	4.5	4.9	10.2	8.0	4.4
% of GDP (rolling four-quarter GDP, based on EUR), end of period									
Gross external debt	51.5	60.2	55.6	59.6	60.2	60.3	61.3	55.2	55.6
Gross official reserves (excluding gold)	31.3	33.0	21.9	34.3	33.0	33.6	30.5	23.5	21.9
Months of imports of goods and services									
Gross official reserves (excluding gold)	4.8	4.9	2.9	5.2	4.9	4.8	4.2	3.2	2.9
EUR million, period total									
GDP at current prices	33,878	38,115	44,000	9,647	10,222	9,847	10,713	11,228	12,212

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

¹ Including net costs of pension reform.

9 Croatia: Moderating Inflation, but Further Rising Foreign Debt

Average annual GDP growth in Croatia accelerated slightly to nearly 5% in 2006, mainly owing to strong gross fixed capital formation.³⁰ Strong private sector credit growth, which came to 20% in real terms by end-2006 (year on year), and rising wages supported domestic demand. Quarterly GDP growth rates in 2006 were characterized by considerable fluctuations, chiefly as a result of substantial instability in all components. While public consumption remained largely flat until the third quarter of 2006 and increased significantly in the last quarter, year-on-year growth in gross fixed capital formation dropped by one-half from the first quarter to the second quarter of 2006 and then picked up again. The contribution of net exports to growth was slightly negative in 2006, though it improved over the year and became positive in the last quarter.

Supported by solid GDP growth, the unemployment rate fell in 2006, but is still at double-digit levels. Labor productivity growth in the industrial sector slowed down in 2006, whereas nominal wage growth picked up. As a result, nominal ULC increased after having declined a year earlier.

The combined current and capital account deficit came to 8.1% of GDP in 2006, a substantial increase from 2004 and 2005. This rise is ascribable to the cumulated effects of a slight deterioration of the trade, services and current transfer accounts. However, unlike in previous years, net foreign direct investment inflows reached 7.8% of GDP in 2006. This was mainly owing to the takeover of the pharmaceutical company Pliva, the recapitalization of individual banks and the ongoing privatization process of the oil company INA. Thus, the large current account deficit was fully financed by FDI inflows. At end-2006, both manufacturing and financial intermediation (excluding insurance and pension funds) each accounted for 31% of the total FDI stock, while the remaining stock mainly related to postal services and telecommunication, wholesale and retail trade as well as hotels and restaurants.

Year-on-year consumer price inflation accelerated to around 4% in the first half of 2006. This development was, however, reversed later in the year and in early 2007, with inflation gradually going back to 1.8% in March 2007. The reasons for this decline are a drop in energy prices and the weakening of seasonal factors which impacted on inflation earlier in 2005 and 2006. Hrvatska narodna banka expects the average inflation rate in 2007 to be at around 2.5%.

The gross foreign debt ratio continued to increase, reaching 84.8% of GDP at end-2006, as the continued decline in gross public foreign debt (19.5% of GDP at end-2006) was not sufficient to offset the rise in the private sector's gross foreign debt. This increase in gross foreign debt is primarily attributable to the nonfinancial corporate sector that recorded an increase in its debt-to-GDP ratio by more than 5 percentage points from the last quarter of 2005 to the last quarter of 2006. The banking sector's debt ratio rose by about 1 percentage point. The net foreign debt ratio rose as well, climbing from 37.4% at end-2005 to 39.3% of GDP at end-2006.

Robust growth driven by strong gross fixed capital formation

Slight improvement on the labor market

Combined current and capital account deficit increases

Inflation coming back to below 3%

Foreign debt remains an evergreen problem

³⁰ A sectoral disaggregation of gross fixed capital formation, which would shed light on the questions of which sectors are the most active investors, was not yet available for 2006 at the cutoff date.

Continued credit growth

In 2006, real credit growth to the private sector accelerated by almost 8 percentage points compared with 2005. Against this background, Hrvatska narodna banka introduced an instrument that penalizes excessive bank lending in addition to the regulations relating to the banking sector's foreign liabilities. As of January 1, 2007, banks are required to purchase so-called kuna-denominated compulsory one-year HNB bills which are remunerated at the rate of the Croatian kuna component of reserve requirements. The basis for the calculation of the amount of bills to be purchased is 50% of the increase in the credit volume in excess of 12% compared with the end of the preceding year. The calculation period runs from January 1 until the end of each month.

Seasonal exchange rate movements and foreign exchange interventions

In 2006, exchange rate movements were again characterized by the usual seasonal pattern reflecting tourism receipts. The exchange rate of the kuna vis-à-vis the euro appreciated until summer and depreciated by some 2.7% between August and October 2006. However, from mid-October, the currency appreciated by 1.3%, triggering two central bank interventions in November and one in December to weaken the Croatian kuna. Subsequently, the exchange rate fluctuated within a narrow range until March 2007 and then depreciated mildly until mid-April.

Gradual consolidation of public finances under way

Croatia is currently in the process of shifting fiscal accounts from government finance statistics (GFS) to ESA 95 methodology. The 2006 budget deficit target, which amounted to 2.2% of GDP in ESA 95 terms, was met. The deficit was thus noticeably smaller in 2006 than in 2005 (2.9% of GDP). This positive outcome largely resulted from higher tax revenues, given robust economic growth and more efficient tax collection, but was also related to efficiency gains on the expenditure side. The 2006 Pre-Accession Economic Programme foresees a deficit of 1.8% of GDP for 2007 and a further reduction to 1.5% of GDP by 2009 on the back of assumed strong economic growth and further fiscal consolidation efforts. However, the European Commission apparently expects a roughly steady fiscal deficit ratio for 2007 and 2008.³¹ Moreover, it sees fiscal risks, in particular as regards added expenditures on pensions, public sector wages and subsidies as well as on extra-budgetary operations.

2006 Article IV consultations by the IMF

After the last agreement with the IMF had expired in November 2006, the Croatian authorities decided not to request a follow-up arrangement. Thus, Article IV consultations are now the primary framework in which IMF surveillance takes place for Croatia. The most recent consultations convey an overall positive assessment of Croatia's economic development. However, the IMF's assessment underlines that gross external debt and current account deficits remain high, notwithstanding efforts in particular related to fiscal adjustment to tame external vulnerability. In addition, the IMF stresses the need for speedier structural reforms and for further improvements of the business climate.

³¹ A precise comparison is not possible, given that the European Commission's projections of Croatia's fiscal balances (published in November 2006) are still based on GFS methodology. The Spring 2007 forecast by the European Commission (released in May) may bring more clarity into this matter.

Table 12

Main Economic Indicators: Croatia

	2004	2005	2006	Q3 2005	Q4 2005	Q1 2006	Q2 2006	Q3 2006	Q4 2006
Year-on-year change of period total in %									
GDP at constant prices	4.3	4.3	4.8	5.2	4.8	6.0	3.6	4.7	4.8
Private consumption	4.8	3.4	3.5	3.8	3.2	4.0	2.1	3.9	4.1
Public consumption	-0.3	0.8	2.2	1.0	1.4	1.0	1.8	1.5	4.4
Gross fixed capital formation	5.0	4.9	10.9	5.8	9.9	18.1	8.4	9.3	9.2
Exports of goods and services	5.7	4.6	6.9	4.9	4.9	14.0	5.2	2.2	11.1
Imports of goods and services	4.6	3.5	7.3	2.3	3.6	16.1	4.2	5.5	5.0
Contribution to GDP growth in percentage points									
Domestic demand	4.4	4.2	5.9	3.3	5.1	10.2	4.0	6.4	3.3
Net exports of goods and services	-0.1	0.1	-1.1	1.9	-0.2	-4.2	-0.4	-1.8	1.6
Exports of goods and services	2.8	2.2	3.4	3.3	2.1	5.2	2.4	1.5	4.8
Imports of goods and services	2.9	2.2	4.5	1.4	2.3	9.4	2.7	3.2	3.2
Year-on-year change of period average in %									
Labor productivity of industry (real)	4.0	6.2	5.7	6.6	6.5	8.0	1.1	6.9	6.7
Gross average wage of industry (nominal)	5.5	5.3	7.5	5.4	5.4	7.2	7.3	6.2	9.4
ULC of industry (nominal)	1.5	-0.8	1.7	-1.2	-1.1	-0.8	6.1	-0.7	2.6
PPI of industry	3.6	3.1	2.9	2.0	2.3	3.5	3.7	2.7	1.7
CPI (here: HICP)	2.1	3.4	3.2	3.5	4.0	3.5	3.8	3.2	2.2
EUR per 1 SIT, + = SIT appreciation	1.0	1.3	1.1	0.3	2.3	2.3	0.9	0.8	0.2
Period average levels									
Unemployment rate (ILO definition, %, 15-64 years)	14.1	13.0	..	..	12.6	..	12.1	..	..
Employment rate (15-64 years)	54.7	55.0	..	..	55.2	..	54.5	..	..
Key interest rate p. a. (%)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
SIT per 1 EUR	7.5	7.4	7.3	7.4	7.4	7.3	7.3	7.3	7.4
Nominal year-on-year change of period average stock in %									
Broad money (including foreign currency deposits)	8.3	9.5	14.0	9.9	10.3	9.9	12.6	15.9	17.3
Contributions to year-on-year change of broad money in percentage points									
Net foreign assets of the banking system	-0.5	-5.0	-3.0	-6.0	-6.0	-6.8	-6.4	-1.8	2.2
Domestic credit of the banking system	9.4	17.3	20.8	18.6	19.6	19.6	21.9	21.6	20.2
of which:									
<i>claims on the private sector</i>	10.1	13.2	20.2	13.6	15.4	17.6	21.3	21.1	20.9
<i>claims on households</i>	7.5	9.0	11.1	9.6	10.0	10.2	11.5	11.3	11.2
<i>claims on enterprises</i>	2.6	4.1	9.2	4.0	5.4	7.4	9.8	9.8	9.7
<i>claims on the public sector (net)</i>	-0.7	4.1	0.6	5.0	4.2	2.0	0.6	0.5	-0.7
Other domestic assets (net) of the banking system	-0.7	-2.7	-3.8	-2.7	-3.3	-3.0	-2.9	-3.9	-5.1
% of GDP (ESA 95)									
General government revenues	..	..	..	..	..	..	..	..	..
General government expenditures	..	..	..	..	..	..	..	..	..
General government balance	-5.0	-3.9	-2.3	..	..	..	..	..	..
Primary balance	..	..	..	..	..	..	..	..	..
Gross public debt	43.7	44.2	42.1	..	..	..	..	..	..
Year-on-year change of period total (based on EUR) in %									
Merchandise exports	18.5	9.3	16.9	6.8	12.0	32.7	5.0	12.9	19.7
Merchandise imports	6.3	10.6	14.0	10.8	13.4	25.0	8.7	14.0	10.7
% of GDP (based on EUR), period total									
Trade balance	-23.4	-24.1	-24.4	-21.6	-25.0	-24.1	-27.6	-22.8	-23.5
Services balance	16.6	17.0	16.7	45.7	2.8	-0.6	15.3	43.8	3.8
Income balance (factor services balance)	-2.2	-3.1	-3.1	-1.3	-0.6	-5.7	-6.3	-1.2	0.1
Current transfers	4.2	3.8	3.2	3.1	3.7	3.8	3.5	2.9	2.9
Current account balance	-4.9	-6.3	-7.7	25.9	-19.1	-26.6	-15.1	22.7	-16.7
Capital account balance	0.1	0.2	-0.4	0.0	0.5	-2.1	0.0	0.1	0.1
FDI (net)	2.5	3.9	7.8	3.7	0.9	6.5	9.2	4.2	11.6
% of GDP (rolling four-quarter GDP, based on EUR), end of period									
Gross external debt	79.4	81.7	84.8	79.0	81.7	82.6	84.1	81.0	84.8
Gross official reserves (excluding gold)	22.4	23.8	25.5	22.9	23.8	25.2	26.7	24.2	25.5
Months of imports of goods and services									
Gross official reserves (excluding gold)	4.8	5.1	5.3	4.9	5.1	5.3	5.6	5.1	5.3
EUR million, period total									
GDP at current prices	28,693	31,272	34,214	8,678	7,886	7,725	8,504	9,451	8,534

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

10 Turkey: Export-Driven Economic Growth

Robust economic performance positive for the overall macroeconomic picture

After posting a strong performance in the years 2004 and 2005, the Turkish economy closed 2006 with slower growth of 6.1% due to a deceleration of domestic demand in the second half of the year. The composition of growth changed somewhat from 2005, with the negative contribution of net exports turning neutral on the back of weakening import growth and the positive contribution that resulted from a moderation of domestic demand. A closer look at the composition of domestic demand in 2006 shows that private consumption growth started to weaken in the second half of the year, partly because of the tighter monetary stance and the contraction of lending in an environment of higher interest rates across the board following the financial turmoil in spring and early summer 2006.³² Growth of real credit to the private sector eased from about 35% at the end of 2005 to about 25% at the end of 2006. In line with this development, gross fixed capital formation declined from high growth rates at the start of the year to a rather moderate growth rate in the last quarter of 2006. Investment went mainly into services, above all into, the financial, transportation and communication sectors. By contrast, public consumption accelerated significantly, fueled by personnel and social security expenditures. The reduction in energy prices in the second half of the year caused import growth to subside to about the same rate as export growth, leaving the contribution of net exports to GDP neutral in the year 2006.

Still no improvement on the labor market

As in the previous two years, labor productivity growth stayed high in manufacturing, and nominal wage as well as ULC growth diminished somewhat in this sector. The still rather high unemployment rate maintained the slow downward trend of the last few years. The employment rate remained stable, with notable increases in the service sector and decreases in the agricultural sector.

Combined current and capital account deficit widens

One of Turkey's persisting macroeconomic vulnerabilities is the large external imbalance that has been building up since 2002. In 2006, the combined current and capital account deficit picked up further and reached around 8% of GDP. This development was partly attributable to the deterioration of the trade balance. On the financial side, net FDI inflows nearly doubled compared to 2005 and covered about three-fifths of the current account gap. FDI was driven by the privatization process, i.a. in the banking sector.

Fiscal discipline turns long-time budget deficit into a surplus

Maintaining a disciplined fiscal policy has remained key to containing the current account deficit, supporting the disinflation process and retaining the confidence of international financial market participants. Under the current Stand-By Arrangement with the IMF, Turkey has agreed to pursue a primary surplus target of at least 6.5% of GNP through 2008. In 2006, the general government balance registered a surplus of 0.4% of GDP for the first time in many years. General government gross debt fell to about 60% of GDP. The main fiscal risks remain related to social security, where a reform law was partly annulled and postponed until 2008, to wage agreements in the public sector and to overall budget quality. As agreed with the IMF during a recent

³² See *Developments in Selected Countries, Focus on European Economic Integration 2/06*, for more details.

Table 13

Main Economic Indicators: Turkey

	2004	2005	2006	Q3 2005	Q4 2005	Q1 2006	Q2 2006	Q3 2006	Q4 2006
Year-on-year change of period total in %									
GDP at constant prices	8.9	7.4	6.1	7.7	9.5	6.7	8.3	4.8	5.2
Private consumption	10.6	9.1	5.0	10.7	18.1	8.0	11.2	1.8	0.1
Public consumption	0.5	2.4	9.6	3.2	0.0	10.1	18.3	14.8	0.7
Gross fixed capital formation	32.4	24.0	14.0	30.6	33.0	32.1	14.0	11.3	4.4
Exports of goods and services	12.5	8.5	8.5	3.9	10.9	6.8	9.1	11.5	6.2
Imports of goods and services	24.7	11.5	7.1	11.2	15.3	10.0	13.7	3.6	1.0
Contribution to GDP growth in percentage points									
Domestic demand	13.9	9.1	5.8	10.3	11.9	9.0	11.9	1.6	2.8
Net exports of goods and services	-4.2	-1.6	0.0	-2.1	-2.2	-2.0	-3.1	2.3	1.8
Exports of goods and services	3.9	2.8	2.8	1.2	3.8	2.4	3.0	3.3	2.2
Imports of goods and services	8.2	4.4	2.8	3.3	6.0	4.4	6.1	1.1	0.4
Year-on-year change of period average in %									
Labor productivity of industry (real)	7.5	6.0	6.7	6.1	8.4	5.1	9.9	6.5	5.2
Gross average wage of industry (nominal)	13.4	12.2	11.5	12.5	11.4	11.3	11.5	11.1	12.1
ULC of industry (nominal)	5.5	5.9	4.5	6.0	2.8	6.0	1.4	4.4	6.5
PPI of industry	14.6	6.0	9.3	4.3	2.3	4.9	8.4	12.6	11.4
CPI (here: HICP)	10.1	8.1	9.3	7.8	7.3	7.6	9.2	10.6	9.7
EUR per 1 SIT, + = SIT appreciation	-4.5	5.9	-7.3	10.4	16.0	8.6	-6.9	-14.4	-14.1
Period average levels									
Unemployment rate (ILO definition, %, 15-64 years)	10.3	10.2	9.7	9.4	10.6	11.9	8.8	9.1	9.1
Employment rate (15-64 years)	43.6	43.5	43.6	44.8	42.9	40.1	44.3	45.0	45.0
Key interest rate p. a. (%)	21.9	14.8	15.6	14.3	13.8	13.5	14.0	17.4	17.5
SIT per 1 EUR	1.8	1.7	1.8	1.6	1.6	1.6	1.8	1.9	1.9
Nominal year-on-year change of period average stock in %									
Broad money (including foreign currency deposits)	24.1	20.4	29.0	20.9	21.4	26.5	30.9	30.7	27.9
Contributions to year-on-year change of broad money in percentage points									
Net foreign assets of the banking system	2.1	6.2	11.5	7.0	7.5	11.1	11.9	10.9	12.1
Domestic credit of the banking system	28.9	20.6	21.4	20.7	18.4	20.4	23.6	21.8	19.7
of which:									
claims on the private sector	19.2	18.9	22.7	18.5	18.9	21.1	24.0	23.9	21.5
claims on households	8.0	8.7	10.5	8.8	9.5	10.3	11.4	11.0	9.3
claims on enterprises	11.2	10.2	12.2	9.8	9.4	10.7	12.6	12.9	12.2
claims on the public sector (net)	9.7	1.7	-1.3	2.2	-0.5	-0.7	-0.4	-2.1	-1.8
Other domestic assets (net) of the banking system	-6.9	-6.4	-3.8	-6.8	-4.5	-4.9	-4.6	-2.0	-3.9
% of GDP (ESA 95)									
General government revenues	..	..	..	..	..	..	..	..	..
General government expenditures	..	..	..	..	..	..	..	..	..
General government balance	-5.8	-0.3	0.4	..	..	..	..	..	..
Primary balance	..	..	..	..	..	..	..	..	..
Gross public debt	76.9	69.6	60.7	..	..	..	..	..	..
Year-on-year change of period total (based on EUR) in %									
Merchandise exports	19.3	15.0	17.5	11.9	19.5	18.8	19.2	18.9	13.9
Merchandise imports	27.2	21.9	17.7	22.5	28.2	27.0	26.3	15.9	4.9
% of GDP (based on EUR), period total									
Trade balance	-8.0	-9.3	-10.1	-8.6	-9.2	-10.8	-13.4	-9.3	-7.6
Services balance	4.3	4.2	3.3	7.3	2.6	1.4	3.1	6.2	1.9
Income balance (factor services balance)	-1.9	-1.6	-1.7	-1.2	-1.4	-1.9	-1.8	-1.4	-1.7
Current transfers	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
Current account balance	-5.1	-6.2	-8.0	-2.1	-7.5	-10.8	-11.7	-4.1	-6.9
Capital account balance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FDI (net)	0.7	2.5	4.8	2.1	5.7	1.7	8.5	3.1	5.9
% of GDP (rolling four-quarter GDP, based on EUR), end of period									
Gross external debt	48.9	49.0	49.6	..	49.0	49.9	48.1	49.2	49.6
Gross official reserves (excluding gold)	11.0	14.7	14.6	12.7	14.7	15.8	14.2	14.7	14.6
Months of imports of goods and services									
Gross official reserves (excluding gold)	3.9	5.2	4.9	4.5	5.2	5.6	4.9	4.9	4.9
EUR million, period total									
GDP at current prices	241,185	292,121	316,247	91,281	82,360	67,246	72,425	93,057	83,519

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

review of the Stand-By Arrangement, the government imposed a freeze on certain budgetary outlays – a factor that is also important in connection with the EU accession process. The European Commission closely monitors developments related to structural reforms that will enhance the quality of medium-term fiscal discipline with regard to both macroeconomic and price stability.

Low private savings and weaker, but still dynamic domestic credit growth are reflected both in the high current account deficit and in the significant increase in Turkey's private net external debt, which amounted to nearly 30% of annual GDP at the end of 2006. By contrast, net public debt has been decreasing steadily since the crisis of 2001. However, a large fraction of public debt is indexed either to the exchange rate or to overnight interest rates and thus remains subject to interest rate or exchange rate risks.

Setback in disinflation process, inflation remains above target

With inflation at almost 10% in 2006, Turkey missed the 2006 end-year inflation target³³ of 5% (± 2 percentage points) by a considerable margin, mainly as a consequence of the passthrough of the depreciation of the Turkish lira during the spring and early summer of 2006. According to the central bank, Türkiye Cumhuriyet Merkez Bankası (TCMB), the cumulative exchange rate passthrough since May 2006 has added around 3.5 percentage points to headline inflation. Although inflation in energy and unprocessed food prices decelerated in the second half of the year, annual inflation rates remained high for these groups of consumer goods. The most recent TCMB inflation poll shows that CPI inflation expectations remain at 7.5% for end-2007, declining to 6.6% 12 months forward and 5.6% 24 months forward. This compares to an official target of 4% (± 2 percentage points) for end-2007 and beyond. Inflation increased again in March 2007, rising to more than 10% year on year, the highest level since mid-2006. The TCMB cites backward-looking price-setting behavior and the sensitivity of service prices to wage hikes as an inflationary risk.

Stable Turkish lira

After the sharp depreciation of the Turkish lira in May and the somewhat smaller depreciation in June 2006 as a consequence of financial market turbulences, the currency recovered some of the earlier losses and traded at around TRY/EUR 1.84 from August 2006. The TCMB uses discretionary interventions when market volatility increases. However, the high current account deficit continues to leave the Turkish lira vulnerable to abrupt changes in global investor sentiment. Financial markets overall have stabilized since early summer 2006, yet interest rates have remained at slightly higher levels, and bond spreads have narrowed less quickly than in many emerging markets.

11 Russia: Continuing Strong Growth and Twin Surpluses

Buoyant domestic demand and accelerating investment contrast with ongoing contraction of net exports

Real GDP in Russia expanded by 6.7% in 2006, which is slightly more than in 2005. Following a weak first quarter, economic activity strengthened in the second quarter of 2006 and remained brisk through year-end. Domestic demand continued to be the driving force of the Russian economy, supported by very rapid credit expansion (real private credit increased by around 36% at

³³ In January 2006, the Turkish central bank switched from explicit to implicit inflation targeting.

the end of 2006). Private consumption growth remained robust, and gross fixed capital formation³⁴ grew particularly strongly. Shrinking net exports increasingly acted as a drag on growth due to very high import growth rates.

Looking at the supply side, economic growth in 2006 was led by construction followed by financial services, wholesale and retail trade. Booming tertiary activities contrasted with slowing industrial production growth and the unimpressive performance of resource extraction.

Buoyed by unusually mild weather in early 2007, economic performance stood out in the first two months of 2007: Investment expanded by over one-fifth year on year, industrial activity increased by 8.6%, and retail trade grew by 13.9%. Unemployment remained largely stable. However, some economic sectors, above all resource extraction and transportation, seem to have reached capacity constraints, and the energy sector continues to struggle with a difficult business climate in which foreign investors appear to be less and less welcome. With overall structural and institutional reforms continuing at a sluggish pace against the backdrop of the upcoming elections of 2007 and 2008, the quality of Russian growth remains somewhat fragile.

Notwithstanding the weakening of oil prices since September 2006, Russia's terms of trade further improved on average in 2006 compared with the previous year. This improvement, rising capital inflows and sustained caution in macroeconomic policies have kept Russia's twin surpluses very high. The combined current and capital account surplus reached almost 10% of GDP in 2006. Even though net FDI inflows crept up to reach 1.1% of GDP, they remained modest. Foreign loans to domestic banks and corporations continued to expand swiftly. The general government budget surplus rose slightly to 8.5% of GDP. Despite this impressive level, IMF calculations suggest that the government's non-oil deficit has risen since 2004, which would point to a certain degree of recent fiscal relaxation.³⁵

The Central Bank of the Russian Federation (CBR) held firm in the face of continuing appreciation pressures, and the Russian ruble lost about 2% against the euro from mid-2006 while gaining 4% against the U.S. dollar in the same period. This, as well as the recent decline in energy prices, flanked by the substantial fiscal sterilization (see below) and the government's decision to defer adjustments of administered prices, helped reduce CPI inflation to 9% in December 2006 and was thus in line with the authorities' revised informal inflation goal (8.5% to 9%). Inflation declined further to 7.8% in February 2007 (year on year), the lowest rate witnessed since mid-1998. The CBR's informal goal for 2007 corresponds to a range of 6.5% to 8% (year-end). According to the CBR, a potential further swelling of capital inflows might strain the authorities' sterilization capacities and is currently seen as the biggest risk to achieving the informal inflation goal for 2007. Furthermore, a possible election-oriented additional relaxation of fiscal policy could also complicate policymaking. Accelerating money supply growth was so far largely matched by increasing money demand, ongoing de-dollarization and further

Booming services contrast with lackluster industrial activity and stagnating resource extraction

Strong growth performance extends into early 2007, though quality remains somewhat fragile

Favorable terms of trade and prudent macropolicies have kept twin surpluses very high

Inflation has dipped recently, but inflationary pressures persist

³⁴ A sectoral disaggregation of gross fixed capital formation, which would shed further light on the most actively investing branches, is not yet available for 2006.

³⁵ IMF estimates of November 2006.

Table 14

Main Economic Indicators: Russia

	2004	2005	2006	Q3 2005	Q4 2005	Q1 2006	Q2 2006	Q3 2006	Q4 2006
Year-on-year change of period total in %									
GDP at constant prices	7.1	6.4	6.7	6.6	8.0	5.0	7.0	6.8	7.7
Private consumption	11.6	12.2	10.9	13.1	13.0	9.2	10.4	11.4	12.4
Public consumption	2.1	2.2	4.2	3.0	3.7	3.2	5.5	4.7	3.4
Gross fixed capital formation	12.6	8.3	13.9	8.9	12.1	5.6	14.7	13.7	17.4
Exports of goods and services	11.8	6.4	7.2	5.1	10.6	8.9	6.4	6.1	7.4
Imports of goods and services	23.3	17.0	21.7	17.8	19.7	22.9	21.7	19.1	23.2
Contribution to GDP growth in percentage points									
Domestic demand	8.8	8.4	9.7	8.8	9.6	6.4	10.0	9.5	12.2
Net exports of goods and services	-1.4	-2.3	-3.9	-3.0	-2.0	-2.9	-3.9	-3.6	-5.0
Exports of goods and services	4.1	2.3	2.6	1.7	4.0	3.4	2.4	2.0	2.9
Imports of goods and services	5.5	4.7	6.5	4.7	6.1	6.3	6.3	5.6	7.9
Year-on-year change of period average in %									
Labor productivity of industry (real) ¹	14.0	7.3	8.3	7.1	7.5	6.9	10.2	8.8	7.4
Gross average wage of industry (nominal) ¹	5.2	21.1	21.4	20.2	22.1	20.1	20.7	22.6	22.0
ULC of industry (nominal) ¹	-7.7	12.8	12.1	12.1	13.6	12.4	9.5	12.7	13.6
PPI of industry	24.0	20.7	12.4	20.6	16.2	14.8	12.7	13.8	8.7
CPI (here: HICP)	11.0	12.5	9.8	12.5	11.2	10.8	9.6	9.6	9.2
EUR per 1 SIT, + = SIT appreciation	-3.1	1.7	3.3	2.5	8.1	7.9	3.6	1.8	0.0
Period average levels									
Unemployment rate (ILO definition, %, 15–64 years)	8.2	7.6	7.2	7.3	7.5	7.8	7.4	6.7	6.8
Employment rate (15–64 years)	..	..	..	..	..	..	..	..	..
Key interest rate p. a. (%)	13.5	13.0	11.6	13.0	12.9	12.0	12.0	11.5	11.1
SIT per 1 EUR	35.8	35.2	34.1	34.8	34.2	33.8	34.2	34.2	34.1
Nominal year-on-year change of period average stock in %									
Broad money (including foreign currency deposits)	35.5	33.9	37.0	35.8	36.8	35.0	36.1	37.4	39.1
Contributions to year-on-year change of broad money in percentage points									
Net foreign assets of the banking system	22.4	34.0	30.8	34.2	32.2	29.2	32.1	31.8	30.2
Domestic credit of the banking system	17.6	0.4	11.7	1.4	5.8	9.3	10.9	11.6	14.4
of which:									
claims on the private sector	30.8	30.0	36.4	29.8	32.6	32.1	34.7	38.3	39.4
claims on households	6.9	8.8	12.0	8.9	10.5	10.8	11.6	12.4	12.8
claims on enterprises	23.9	21.2	24.4	20.9	22.1	21.3	23.0	25.9	26.6
claims on the public sector (net)	-13.2	-29.6	-24.6	-28.4	-26.8	-22.8	-23.7	-26.6	-25.0
Other domestic assets (net) of the banking system	-4.5	-0.2	-5.8	0.1	-1.2	-4.2	-7.6	-6.0	-5.5
% of GDP									
General government revenues	31.9	39.7	40.0	..	..	..	..	..	..
General government expenditures	27.4	31.6	31.5	..	..	..	..	..	..
General government balance	4.5	8.1	8.5	..	..	..	..	..	..
Primary balance	..	..	..	..	..	..	..	..	..
Gross public debt	21.7	14.9	..	..	..	..	..	..	..
Year-on-year change of period total (based on EUR) in %									
Merchandise exports	22.6	33.7	22.9	34.0	38.8	46.4	28.6	18.0	7.1
Merchandise imports	16.6	29.6	28.9	30.2	39.7	31.7	32.1	26.3	27.1
% of GDP (based on EUR), period total									
Trade balance	14.5	15.5	14.1	15.7	14.7	18.1	16.2	13.7	9.8
Services balance	-2.3	-2.0	-1.5	-2.5	-1.9	-1.3	-1.4	-1.8	-1.5
Income balance (factor services balance)	-2.2	-2.5	-2.9	-3.8	-2.4	-1.6	-4.4	-3.0	-2.5
Current transfers	-0.1	-0.1	-0.1	-0.2	-0.3	0.0	0.1	-0.3	-0.3
Current account balance	9.9	10.9	9.6	9.3	10.1	15.2	10.5	8.7	5.6
Capital account balance	-0.3	-1.7	0.0	-5.2	-0.3	0.0	0.0	0.0	0.0
FDI (net)	0.3	0.2	1.1	1.9	-3.8	1.2	3.8	0.8	-0.9
% of GDP (rolling four-quarter GDP, based on EUR), end of period									
Gross external debt	33.5	36.2	29.9	33.1	36.2	34.2	32.5	28.6	29.9
Gross official reserves (excluding gold)	18.6	24.0	31.1	22.6	24.0	24.9	27.7	27.4	31.1
Months of imports of goods and services									
Gross official reserves (excluding gold)	10.1	13.3	17.6	12.7	13.3	14.0	15.6	15.6	17.6
EUR million, period total									
GDP at current prices	475,479	616,014	785,586	168,741	178,511	167,314	185,145	212,106	221,020

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

¹ Due to breaks in the time series data are only indicative.

monetization. The volume of bank credits continued to expand robustly. The lack of full reliability of prudential data may be hiding problems of some banks with loan quality.

Foreign currency reserves (including gold) reached a new record level of EUR 260 billion in early April 2007 (which corresponds to about 19 months of goods and services imports). Russian foreign exchange reserves are the third-largest in the world (following those of China and Japan). In mid-February 2007, the CBR reported reserves to be allocated roughly as follows: 50% in U.S. dollars, 40% in euro, 10% in pounds sterling. The country's Oil Stabilization Fund³⁶ (which makes up part of the reserves) almost doubled to EUR 79 billion within a year. In line with a decision by the Duma in April 2007, the fund will be divided into a Reserve Fund (for macrostabilization purposes) and a Fund for Future Generations. Furthermore, three-year budget planning is to be introduced and separate oil and non-oil budgetary systems are to be established. Respective legal changes were passed by the Duma in mid-April 2007 and are to be successively implemented, starting next year. Russian gross external debt declined further and came to 30% of GDP at the end of 2006, as the public debt situation improved further while private liabilities expanded. For the first time in decades, gross official reserves were higher than gross external debt at the end of 2006, suggesting that the country has become a net creditor to the rest of the world.

In early February 2007, the CBR increased the weight of the euro in the dual currency basket used to steer the Russian ruble's exchange rate. The euro's share was adjusted from 40% to 45%, and the U.S. dollar's share changed accordingly, dropping from 60% to 55%. The rationale for this step was to better reflect the structure of the country's foreign trade. The Russian ruble's real-effective exchange rate had gone up by 3% since mid-2006. The currency's unrelenting real appreciation as well as strongly rising wages (nominal wage growth in industry surpassed 20% in both 2005 and 2006 and quickened further to 26.8% year on year in January 2007) and, consequently, surging ULC seem to be putting the competitiveness of various manufacturing branches under pressure. Ollus and Barisitz (2007)³⁷ shed more light on this issue by comparing sectoral import with sectoral output developments in Russian manufacturing, showing that import competition in manufacturing is strong and rising, which indicates the possibility of incipient Dutch disease.

Cutoff date for data: April 25, 2007.

Foreign exchange reserves and stabilization fund mark new highs again

Real effective exchange rate appreciation and mounting import competition point to Dutch disease threat

³⁶ See *Focus on European Economic Integration* 1/04, p. 42; for a detailed analysis, see Astrov, V. 2007. *The Russian Oil Fund as a Tool of Stabilization and Sterilization*, in this issue of *Focus on European Economic Integration*.

³⁷ Ollus, S. and S. Barisitz. 2007. *The Russian Non-Fuel Sector: Signs of Dutch Disease? Evidence from EU-25 Import Competition*. In: *BOFIT Online 2* and this issue of *Focus on European Economic Integration*.

STUDIES

Determinants of House Price Dynamics in Central and Eastern Europe

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This paper examines the determinants of house price dynamics in Central and Eastern European (CEE) transition economies. While we emphasize the role of conventional fundamental factors, we also highlight the importance of transition-specific factors in house price dynamics in the region. We take a comparative approach by looking at various panels composed of eight CEE transition economies (Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Lithuania, Poland and Slovenia) and 19 industrialized non-CEE OECD countries. The use of these panels provides insights into the common determinants of house prices for the two groups of countries and, at the same time, allows us to identify the reasons for important differences in house price dynamics across countries. Overall, this paper shows that the growth in house prices in Central and Eastern Europe can be explained fairly well by the development of conventional underlying fundamentals and transition-specific factors.

1 Introduction

As an essential good, housing accounts for a large share of household expenditure and assets as well as for a significant part of economic activity. By affecting households' net wealth and their capacity to borrow and spend as well as profitability and employment in construction, real estate services and financial service industries, developments in house prices have major economic implications.

Since the early 1990s, house prices in many industrialized countries have been rising rapidly. According to OECD data, real house prices have increased by an annual average of 11% since 1993 in Ireland, by over 7% per year in Spain, much of Scandinavia and the United Kingdom and by about 4% per annum in the United States. These growth rates are high both by historical standards for housing markets and compared to the long-term growth rates of other asset prices. Against this background, a large number of studies have sought to explain the determinants of changes in house prices in non-CEE OECD countries.

In recent years, housing markets have also revived in many Central and Eastern European countries (CEECs). Although house prices in this region remain, on average, well below the levels observed in Western Europe, they have been catching up rapidly, with sustained real annual increases in the double-digit range not uncommon. Unlike the determinants of changes in house prices in industrialized countries, however, those in Central and Eastern Europe (CEE) have not yet been systematically investigated. This void in the literature provides a rationale for the present paper.

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To our knowledge, this is the first paper that quantitatively analyzes the driving forces behind house price changes in transition economies.⁴ We take a comparative approach and study the determinants of house price changes for various panels composed of transition economies and developed OECD countries. The use of these panels provides insights into the common determinants of house price changes for the two groups of countries and, at the same time, allows us to identify some important differences.

We emphasize the role of conventional fundamental determinants of changes in house prices, such as changes in disposable income, interest rates, credit growth and demographic factors. However, we also highlight the importance of transition-specific factors such as major improvements in the quality of newly constructed housing, the profound transformation of housing market institutions and housing finance, growing external demand for housing in CEE and sustained real wage growth stemming from the catching-up process.

This paper is structured as follows. Section 2 provides an overview of house price dynamics in eight CEECs (Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Lithuania, Poland and Slovenia) and in 19 developed OECD countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Japan, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, the United Kingdom, the United States) since the mid-1990s. Section 3 briefly reviews the empirical literature on house price determinants and illustrates the evolution of conventional fundamentals and transition-specific house price determinants in CEE. Section 4 presents our empirical model and describes the data set and estimation techniques. Section 5 presents the estimation results and section 6 concludes with a discussion of empirical results.

2 House Prices in Transition Economies: Hares and Tortoises

In principle, one would expect house prices to grow faster in CEE than in advanced industrialized countries because the initial level of house prices is lower in CEE (see box 1 in the appendix) and because the transition economies are growing much faster. At first glance, however, house prices in CEE do not seem to have grown systematically faster in the period under observation: They remained more or less flat in Poland over the past five years and increased at about the same pace as in the majority of industrialized countries in Croatia, the Czech Republic, Hungary and Slovenia (table 1).⁵ The main exceptions to this trend were Bulgaria, Estonia and Lithuania, where house prices surged by an average of 22% to 36% per year since 2002, much faster than in any other industrialized country. Only Spain has seen house prices grow by more than 15% per annum on average over the past five years.

The heterogeneous nature of housing imposes severe limitations on the comparison of different measures of house prices. Data obtained from national

⁴ OECD (2002 and 2005) and Palacin and Shelburne (2005) provide detailed descriptions of housing markets and housing finance in CEE.

⁵ Note that in the Czech Republic and Hungary, house prices surged particularly strongly during the late 1990s.

Table 1

Average Growth Rates of House Prices					
Four-quarter percentage changes, in national currency units; period averages					
Industrial countries			Central and Eastern Europe		
	1995–2001	2002–2006		1990s–2001 ¹	2002–2006
Germany	–0.4	0.1	Poland (2000)	5.4	1.6
Japan	–2.0	0.3	Croatia – Zagreb (1998)	0.7	8.2
Portugal	4.7	1.3	Croatia (1997)	2.7	8.7
Austria	–1.1	1.5	Slovenia – Ljubljana (1996)	6.3	8.9
Norway	9.9	6.2	Czech Republic (2000)	15.4	10.9
Finland	6.9	6.5	Czech Republic – Prague (2000)	13.8	13.4
United States	4.2	7.2	Hungary (1998)	2.9	13.4
France	1.5	7.5	Bulgaria (2001)		21.7
Sweden	6.5	7.6	Lithuania (2000)	–4.1	25.1
Denmark	8.5	7.8	Estonia (1995)	12.5	35.7
Greece	8.6	9.2			
Canada	1	9.3			
Belgium	6.4	9.8			
Ireland	13.6	10.4			
Australia	5	11.3			
Netherlands	1.5	12.6			
New Zealand	4.8	13.4			
United Kingdom	7.3	14.6			
Spain	6.4	18.5			

Source: Authors' calculations using data described in the data section.

¹ The year in which country data were first compiled is shown in parentheses.

sources refer to different types of residential property (new versus existing) or to their weighted averages, so it is not unusual that growth rates of house prices differ widely for the same city, region or country. These differences are even greater when data from commercial sources (e.g. real estate companies) are considered, which is often necessary, given the lack or inadequate coverage of official data in CEE.

3 Determinants of House Prices

3.1 Empirical Literature

The empirical literature on the determinants of house prices is vast. A sample of recent studies for the euro area, for various groups of industrialized countries and for small European economies is summarized in table A1 in the appendix.

Estimated elasticities of real house prices with respect to economic fundamentals – disposable income, interest rates, credit growth, demographic factors, housing supply as well as other demand and supply factors – differ widely depending on the sample of countries, the period examined and the methodology used. Nevertheless, two common patterns seem to emerge. First, key elasticities are higher for smaller countries (such as Ireland and the Netherlands) and catching-up economies (e.g. Ireland and Spain) than for the samples that include large industrialized countries. Second, the following factors also play a role in house price dynamics in addition to real income and real interest rates: credit growth, demographics and supply-side factors. These results are also broadly confirmed in empirical studies on housing markets in industrialized countries such as Denmark, Finland and Norway (see Girouard et al., 2006), which are not reported in table A1 in the appendix.

3.2 Fundamentals in Central and Eastern Europe

Just how important the conventional fundamental determinants of house prices are can be seen from their recent evolution in CEE. As shown in chart 1, over the past ten years *real GDP* increased by about 50% on average in Central European countries (the Czech Republic, Hungary, Poland and Slovenia), by about 40% in Southeastern Europe (Bulgaria and Croatia) and by over 100% in Estonia and Lithuania. Most of the acceleration in real growth has taken place since 2000. This development has coincided with the implementation of EU accession-related institutional reforms that were a precondition for the development of housing markets (see below).

Nominal interest rates on long-term bank loans to households in the CEECs declined from over 30% on average in 1995 to about 13% in 2000 and to slightly over 6% in 2005 (chart 2). This means that the cost of borrowing for households declined significantly over the past ten years, making access to housing loans much easier than in the past.

Bank credit to households in CEE expanded by an annual 37% on average between 2000 and 2006, while housing loans went up by 59% per annum – much faster than total private sector credit, which posted a growth rate of 21% on average (see table 2). Housing loans were a factor in the credit dynamics recently observed in CEE, contributing an average of 35% to total private sector credit growth in 2005 and 2006.

In recent years, a large proportion of credit to households (especially housing loans) in CEE – with the exception of the Czech Republic – has been extended in foreign currencies (up to 80% in Croatia and Estonia in 2006, see table 2). Such loans are usually denominated in euro (in the Baltic countries, Bulgaria and Croatia) but increasingly also in Swiss francs (in Hungary, Poland and recently also Croatia). The main motivation for taking on foreign currency loans is lower interest rates: In 2006, the average interest rate differential between long-term household loans in foreign and domestic currencies was

Chart 1

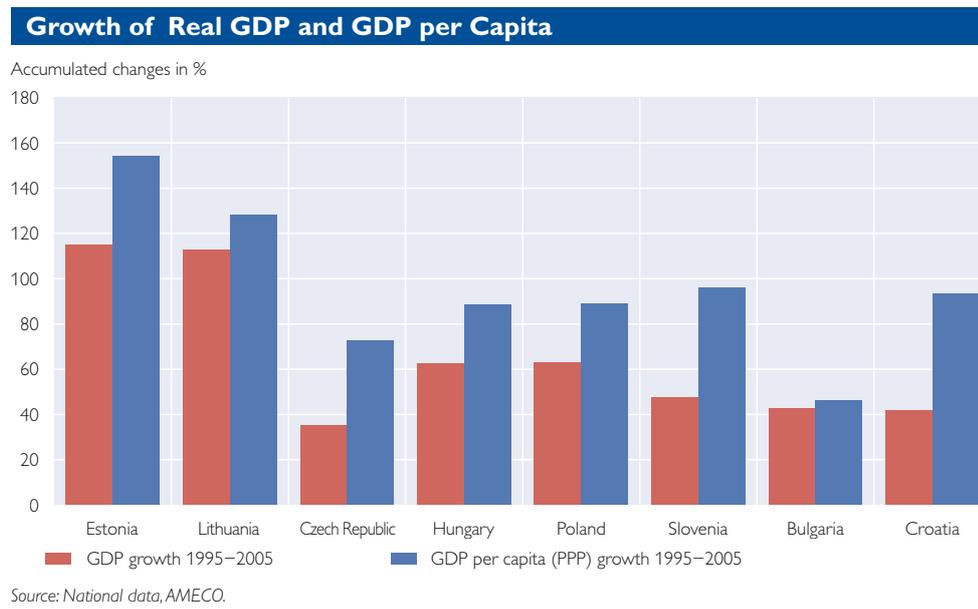
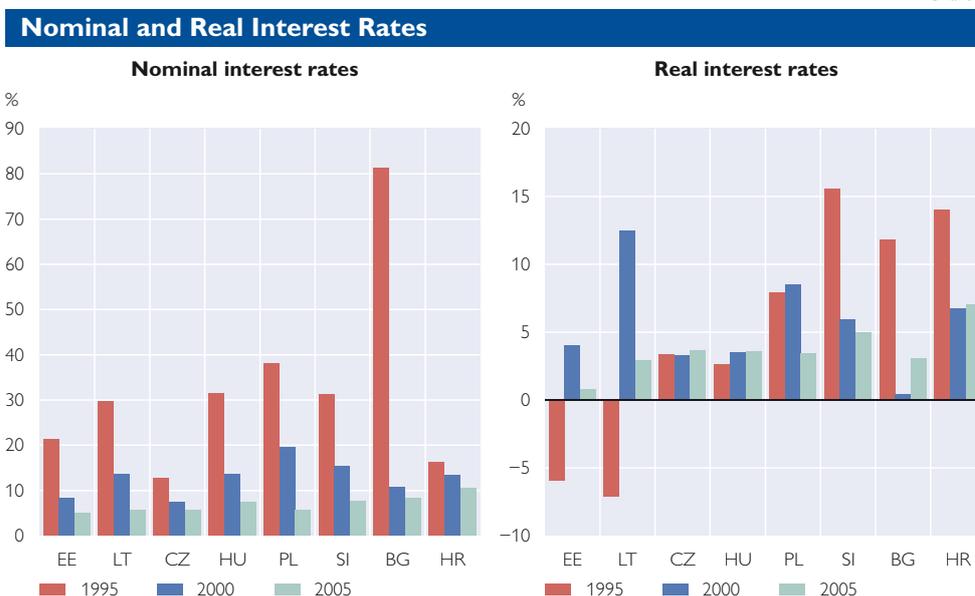


Chart 2



Source: National data, BIS.

Note: Weighted average of long-term interest rates on domestic and foreign currency loans to households; nominal interest rates deflated by average annual CPI.

about 2¾ percentage points, ranging from 0.2 percentage point in Lithuania to 6½ percentage points in Estonia. Moreover, many currencies in the region have been appreciating in nominal terms against the euro owing to strong capital inflows. This suggests that *exchange rate developments* have been another important determinant of house price dynamics in CEE.

Table 2

Commercial Bank Lending to Households, 2000 to 2006¹

Country	Household credit						Total private sector credit growth
	Total % per annum	Housing % per annum	Consumer % per annum	Share of foreign exchange loans ² %	Contribution to credit growth ³ %	Share in private sector credit %	% per annum
Bulgaria	50.4	71.5	39.9	17	50	37	37
Croatia	26.6	24.9	27.9	80	63	56	17.8
Czech Republic	33	69.8	13.9	0	89	38	0.8
Estonia	45.3	45.6	35.9	78	55	50	31.9
Hungary	45.5	68.7	47.1	40	59	34	25.3
Lithuania ⁴	58.7	81.6	83.2	49	41	38	30.7
Poland	24	48.8	15.3	39	49	40	8
Slovenia	14.2	..	..	42	22	28	17.9
Average	37.2	58.7	37.6	43	54	40	21.2

Source: IMF, central banks, authors' estimates.

¹ Average annual growth rates in %, except for shares and contribution of household credit (in % of total). Growth rates of household credit based on monthly data. In most cases, the latest observation for 2006 is for August.

² Share of foreign currency loans in total household loans in 2006 (for Croatia, including foreign currency-linked loans).

³ Contribution of household credit growth to total private sector credit growth in % (average for the period from 2003 to 2005).

⁴ Housing and consumer credit for the period from 2005 to 2006.

In addition to strong income growth, declining interest rates, rapid credit growth and exchange rate developments, *demographic factors* have also played a role in housing demand and house prices. Overall population figures in CEE are stagnating or declining. However, many CEECs experienced small baby booms in the 1970s and early 1980s. As these cohorts are gradually nearing their prime earning age, they are entering the housing market, thus providing a strong boost to demand, especially for higher-quality housing.

3.3 Transition-Specific Fundamentals

In the countries undergoing transformation from a planned to a market economy, house price dynamics are also influenced by several transition-specific factors. These include the poor quality of initial housing stock, a weak institutional infrastructure for the functioning of housing markets, the initial absence and subsequent rapid development of housing finance, and external demand for housing. Except for housing finance innovations and, in cases such as Spain, external demand, these factors no longer have any major impact on the dynamics of house prices in mature market economies.

3.3.1 The Poor Quality of Initial Housing Stock

It is a well-known fact that the quality of housing in socialist countries was low. As recently as 2002, the CEECs scored much lower than most industrialized countries with regard to measures of housing quality such as access to piped water, a fixed bath or a flush toilet (chart 3).⁶ Other indicators of housing quality – the average size of dwellings and floor space per occupant – were also markedly lower in CEE.

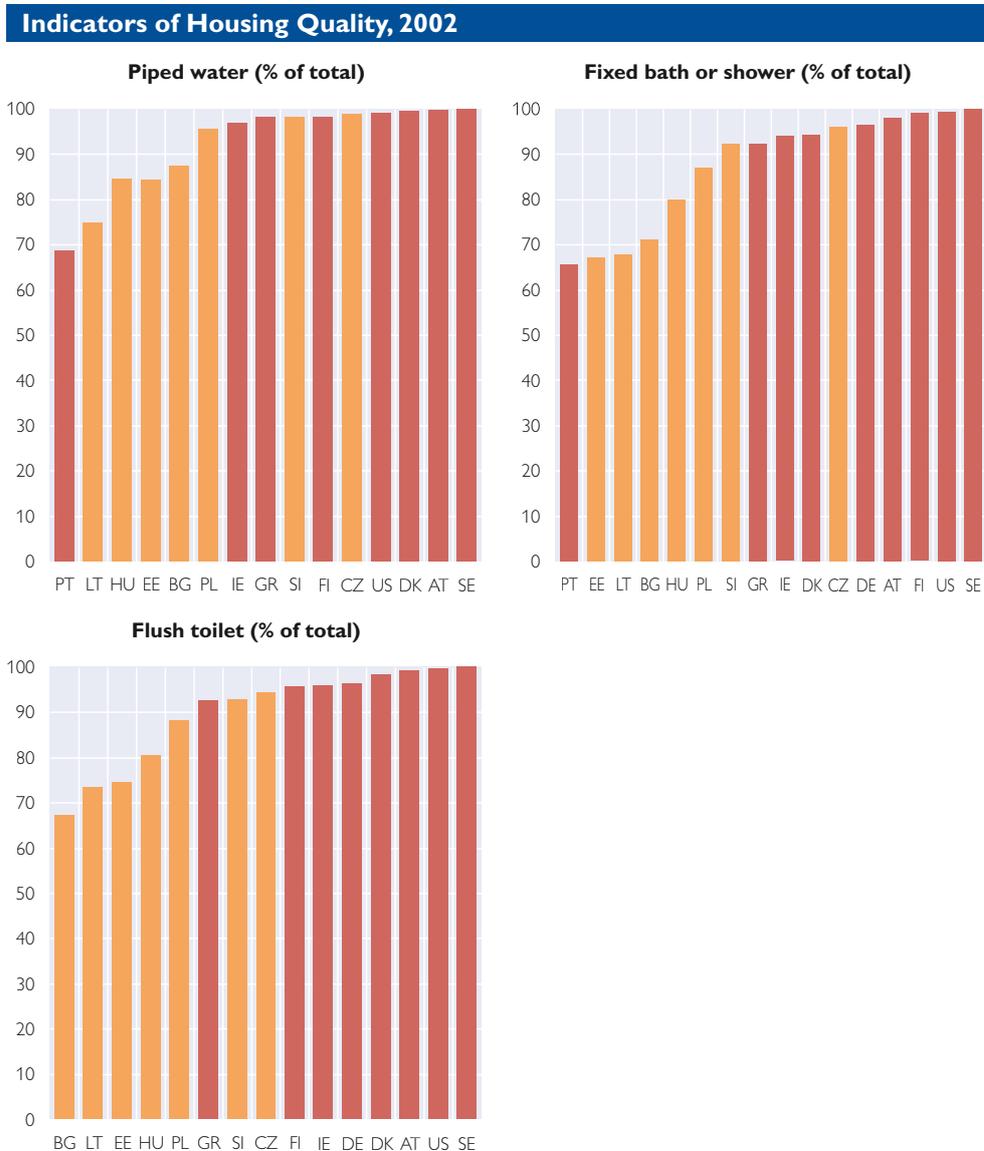
One would therefore expect that, once better-quality housing became available on the market, house prices in CEE would grow faster on average than in countries with a higher quality of the initial housing stock.⁷ The rapid increase in house prices in CEE may thus simply reflect improvements in housing quality. Because quality adjustments are likely to persist for as long as the transition economies keep on catching up with the standard of living in the EU-15 countries, house prices in CEE can be expected to grow faster than in Western Europe in the foreseeable future.

The impact of improved housing quality on house prices can be assessed only indirectly, because statistical offices in CEE (like in many Western European countries) do not compile quality-adjusted house price indicators (although consumer price indices are usually partially adjusted for such quality changes). The real value of residential construction per square meter of newly constructed dwellings can provide a rough indication of changes in housing quality. This indicator is obtained as the value of residential construction per average area of new dwellings (excluding land prices and adjusted for changes in average area) deflated by the construction cost index. While the time span under observation is rather short, chart 4 suggests that housing quality went

⁶ The CEECs performance has certainly improved since, but the wide gap is unlikely to have closed by now.

⁷ This phenomenon is basically a composition effect, where more weight is given to higher-quality and higher-priced housing.

Chart 3



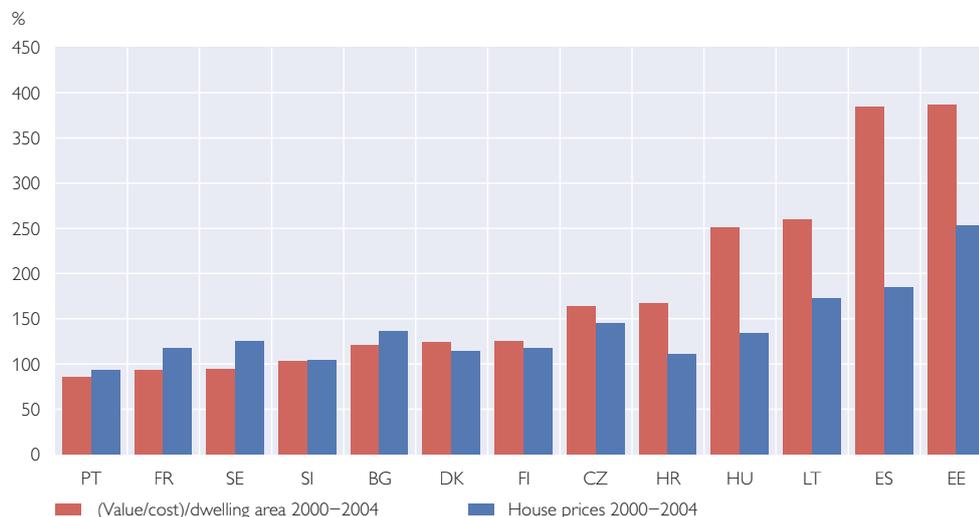
Source: OECD, OEC.

Note: Piped water: data for Hungary from 1997 and for Denmark from 1993. Fixed bath or shower/Flush toilet: data for Hungary from 1997 and for Germany from 1993. Orange bars denote CEECs, red bars EU-15 countries.

up in most, though not all, CEE economies between 2000 and 2004.⁸ As indicated in chart 4, changes in real house prices during the period from 2000 to 2004 were generally closely correlated with the construction cost index. Exceptions were Croatia, Hungary, Estonia, Lithuania and Spain, where real construction costs climbed considerably faster than real house prices, probably because of capacity constraints in the construction industry and, in particular, the labor market.

⁸ We assume that the construction cost index reflects quality changes, while the value of residential construction per average area of new dwellings does not. The measure of changes shown in chart 4 is thus imperfect.

Chart 4

**Increase in House Prices and the Real Value of Newly Constructed Housing,
2000 to 2004**

Source: National statistical offices; authors' calculations.

Note: Increase in value of residential construction per average area (in m²) of new dwellings, deflated by construction cost index (2000=100); increase in average house prices, deflated by the CPI (2000 = 100).

3.3.2 Limited Supply of Housing

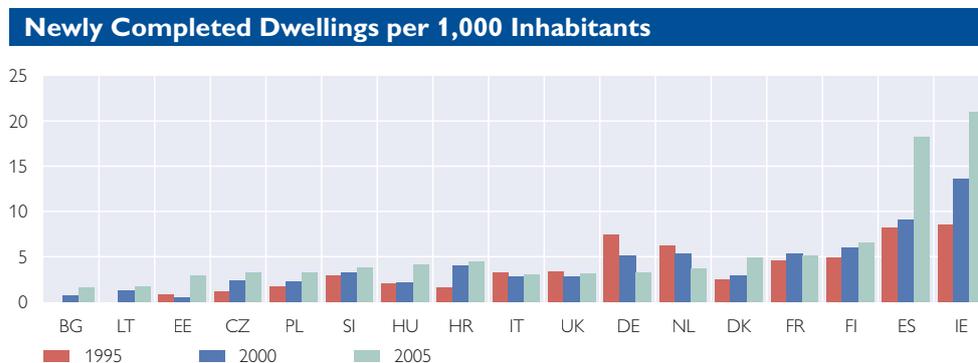
Another transition-specific factor that has affected the dynamics of house prices in CEE is the limited supply of new homes. For many decades, the public sector had been the dominant supplier of new housing in CEE, especially in cities. During the 1990s, however, the public sector largely withdrew from housing construction owing to public expenditure retrenchments. Private construction companies and property developers only gradually began to fill the resulting void. Even where the capacity to build new private homes existed, spatial planning was often inadequate, which means that long construction delays were common. This situation resulted in a shortage of new, better-quality housing, which may explain why house prices went up so fast in some countries.

As shown in chart 5, in 1995 less than 2 new dwellings were completed on average per 1,000 inhabitants in CEE, compared with 3 to 8 dwellings in Western Europe. By 2000, the supply of new homes had increased only marginally (except in Croatia and Slovenia). Even in 2005, the supply of new housing in countries such as Bulgaria, Estonia and Lithuania – which, as noted above, recorded the fastest growth of house prices – was far below the supply in Western European countries with strong housing markets, such as Denmark, Finland and France, not to mention Ireland and Spain. Against this background of constrained supply, the rapid increase in house prices in some CEECs should not come as a surprise.

3.3.3 Institutional Factors and Housing Finance

In an environment of weak housing market institutions and nonexistent housing finance prevailing in most CEECs until the early 2000s, housing markets generally languished and, with few exceptions (see footnote 2), changes in

Chart 5



Source: National statistical offices, UNECE.

house prices were anemic. Improvements in the regulatory and institutional framework, which were necessary for the development of the property market, largely occurred in the past four to five years as a result of the EU accession process. In particular, reforms in legislation and judiciary practices that make it easier for creditors to seize real estate collateral removed a key obstacle to the buying and selling of property.⁹

Together with banking sector restructuring and the acquisition of local banks by strategic foreign investors with strong retail expertise, these reforms have spurred the development of housing markets and housing finance in CEE. Many banks started to provide longer-term housing loans, the loan-to-value ratios increased, and interest rates started to decline (chart 2).¹⁰ Despite the fact that the housing market in CEE is a relatively young market – as reflected, among other things, by high fees – housing finance is highly competitive, with margins beginning to approach Western European levels in some countries. However, relative to the EU-15, mortgage penetration in CEE remains much lower and access to mortgage loans is still limited to higher-income households.

One can expect the development of housing market institutions and the lifting of credit constraints to be positively correlated with the growth of house prices on both theoretical and empirical grounds. Asset prices, including house prices, tend to rise toward equilibrium levels when markets are deregulated. Empirically, this development has been observed in many countries in Western Europe in the late 1980s and early 1990s. The United Kingdom, for instance, experienced a major housing boom in the late 1980s during a period of financial liberalization (see Attanasio and Weber, 1994; Ortalo-Magné and Rady, 1999).

⁹ Housing finance was generally unknown in socialist countries. Most urban housing was provided to workers free of charge by their employers or local authorities. The rare financial transactions that took place between private persons were normally settled in cash (often foreign exchange).

¹⁰ Mortgage lending currently comes in two main forms: standard mortgage loans, which are usually provided by banks, and “building savings” based on the German building society model. For a comprehensive review of housing finance in transition economies, see OECD (2002 and 2005) and Palacin and Shelburne (2005).

3.3.4 Wage Costs

Wages are an important component of construction costs. While changes in wage costs affect house prices everywhere, they play a more pronounced role in the rapidly catching-up economies, where continuous wage increases resulting from advances in real convergence are an important cost push factor for house prices. Rising wages lead to a systematic rise in construction costs, unless counterbalanced by productivity gains in the construction sector.

3.3.5 External Demand for Housing

In recent years, a new factor adding to housing demand in CEE has been – this is somewhat unusual for the property market – increased *external* demand (see Mihaljek, 2005).¹¹ Housing is usually thought of as a nontraded good *par excellence*, but the removal of restrictions to property ownership and labor mobility within the European Union are increasingly giving housing the characteristics of a traded good. The external demand for housing in CEE has three components: the demand for second homes by residents of EU-15 countries, the demand by CEE citizens who temporarily work abroad, and investment demand.

The demand for second homes by residents of EU-15 countries partly reflects demographic factors and partly the low interest rate environment of the past few years. As baby boomers from Northern Europe approach retirement age, they are increasingly looking for second homes in coastal areas in Southern Europe, where they could spend part of the year during retirement. Second homes in countries such as France, Italy and Spain have become fairly expensive in recent years.¹² Many retiring baby boomers have therefore turned their attention to properties in Bulgaria, Croatia, Montenegro and Romania. Even in the Czech Republic, the Baltic countries and Poland, the demand for second homes by nonresidents has gone up.

The demand for housing by CEE citizens working abroad is a consequence of the stronger migration from Eastern to Western Europe following EU enlargement in 2004. Even with restrictions on labor mobility in place in most EU-15 countries (with the exception of Ireland, Sweden and the U.K.), hundreds of thousands of workers from the Baltic countries and Poland, in particular, have started to work in EU-15 countries, sending remittances to their home countries. These remittances are partly used to finance residential construction, pushing up house prices in the process.¹³

Investment demand has so far concentrated on commercial real estate (mainly shopping malls and office space in major cities). But with property investment markets in CEE performing well, investors who three years ago

¹¹ While external demand could potentially affect all economies, we regard it as a transition-specific factor because it is generated by economic integration, which is, in turn, triggered by economic transformation and restructuring.

¹² Moreover, overbuilding and the destruction of the coastal environment have become an important issue in some countries, in particular Spain.

¹³ For instance, remittances have accounted for 3% to 5% of household expenditure in the Baltic states and Poland since 2004 (World Bank). Unlike past economic migrations, the most recent east-west flows of workers by and large represent temporary, cross-border commuting facilitated by cheap transportation. According to opinion surveys, most migrant workers plan to return once they have saved enough to build a house or start a business in their home countries.

would have only considered offices are now reportedly open to the industrial, hotel and residential sectors (CB Richard Ellis, 2005).

Anecdotal evidence indicates that external demand for housing in CEE is still relatively small compared, for instance, with Spain. Nonetheless, external demand plays an important role in house price dynamics because it affects sellers' expectations. If the supply of land for construction is limited owing to the slow adjustment of zoning regulations, external demand will cause land prices to rise. This increase can spill over to house prices for local residents, as landowners are unwilling to sell land at lower prices for local housing projects if they can obtain a higher price from foreign buyers.

3.4 House Price Misalignments

Like prices of other assets, house prices can occasionally be disconnected from underlying fundamentals. In the case of the CEECs, one reason for house price misalignment could be the highly distorted relative prices at the beginning of transition, i.e. *initial undershooting*. The price of housing relative to other consumer durables (or the level of rents relative to the price of other consumer services) had been severely distorted under socialism. This distortion has not yet been corrected because the bulk of housing stock was privatized at nonmarket clearing prices. Typically, local governments sold residential property to long-time "renters" at a fraction of the market price prevailing at the beginning of transition in the 1990s. This has led to a very low turnover in the property market, given the very high proportion of privately-owned and owner-occupied housing.¹⁴ In addition, because of the relative homogeneity of existing housing stock (most of which was built in apartment blocks after the Second World War), there was not much opportunity for moving up the "housing ladder," as is common in Western European countries.

As housing privatization was completed and institutional, regulatory and housing finance reforms were implemented, the initially distorted relative house prices started to move toward equilibrium. One piece of anecdotal evidence of the magnitude of this change – and, hence, the extent of initial undershooting – is provided by the change in the price of an apartment in a typical block of CEE flats built in the 1970s relative to the price of a middle-class passenger car produced in Western Europe, such as a Volkswagen Golf (equivalent to the VW rabbit). In the early 1990s, this relative price was roughly 1:1. By 2006, the same – nonrenovated – apartment was roughly four times more expensive than the VW Golf. In other words, even without any commensurate change in underlying fundamentals, the fourfold increase in the relative price of housing over the past 15 years would have been consistent with the correction of initial undershooting.

House prices might also be disconnected from economic fundamentals because of *overly optimistic expectations* of future growth in the underlying fundamentals. During the upturn of the business cycle, economic agents

¹⁴ In Western Europe, the share of housing owned by private individuals ranges from about 60% in Austria and Sweden to 90% to 95% in Belgium, Greece, Spain and Portugal, while the share of owner-occupied housing ranges from 38% in Germany to 80% in Ireland (OECD, 2002). In CEE, private individuals on average own 80% to 95% of the housing stock, while the ratio of owner-occupied housing in many countries (e.g. Bulgaria, Estonia, Hungary, Slovenia and Romania) exceeds 90% (*ibid.*).

typically become optimistic about the future outlook for the economy in general and the property market in particular. For instance, EU accession and the prospect of euro adoption might have rendered economic agents in CEE excessively optimistic about future prospects – a phenomenon/development which may push up house prices.

House price bubbles could also be triggered by a *credit boom*, which could in turn result from positive shocks to wealth, financial market liberalization and/or financial innovations that lead to low interest rates (Gourinchas, Valdes and Landerretche, 2001). A greater availability of housing loans, for instance, may spur the growth of house prices, especially in areas where housing supply is lagging behind the demand. At the same time, rising house prices may make it necessary for households to take on larger mortgages and may induce some individuals to invest in property for speculative purposes. This may lead to a self-reinforcing cycle of credit expansion and increases in house prices.

Finally, *capital inflows* associated with the external demand for housing (and foreign investment in real estate in CEE in general) can also lead to house price increases that are unrelated to underlying fundamentals. For instance, the demand of foreigners for vacation homes on the Croatian coast has raised local house prices at a rate that is not in line with general housing market trends or with trends in underlying domestic fundamentals. Global real estate companies with deep pockets can easily buy up whole city blocks for redevelopment in CEE and thus significantly affect market sentiment and sellers' expectations.

4 Economic and Econometric Approach

4.1 The Empirical Model

As suggested earlier, our data set does not (fully) allow us to empirically investigate all the economically interesting issues related to house price developments in CEE. In particular, we are not in a position to assess the possible degree of house price misalignments and we have only a small number of rough proxies to analyze transition-specific factors.

Against this background, our model of house price determinants draws on the standard variables used in the empirical literature discussed above and also takes account of some transition-specific factors. In our analysis, we face two major constraints. First, given that we cover a large number of countries in an attempt to compare the determinants of house prices in developed and catching-up economies, it is very difficult to obtain a comprehensive and comparable data set for some of these variables. Second, given the low number of observations for transition economies, our model can include only a limited set of variables in a dynamic panel context.

Our baseline specification tries to explain house prices with GDP per capita (*capita*) and real interest rates (*rir*). In this simple specification, higher GDP per capita and lower real interest rates are associated with higher house prices.

$$p^{house} = f(\overset{+}{capita}, \overset{-}{rir}) \quad (1a)$$

The house price model is estimated using real house prices (nominal prices deflated by the CPI), GDP per capita converted to euro using PPP rates (alternatively, GDP per capita at constant prices and cumulated real GDP

growth), and real ex-post interest rates using annualized inflation rates ($I_t / (P_t - P_{t-4})$). We also use nominal interest rates because Sutton (2002) and Tsatsaronis and Zhou (2004) show that nominal interest rates perform better than real interest rates in explaining house prices, given that banks typically base their decision to grant a housing loan on the ratio of debt servicing costs to income. This ratio depends on the nominal and not the real interest rate. In this formulation, nominal interest rates (nir) might also serve as a proxy for loan availability.¹⁵

$$p^{house} = f(\overset{+}{capita}, \overset{-}{nir}) \quad (1b)$$

We check the robustness of the results for this basic specification in three steps. First, the interest rate in equation (1a) initially includes the lending rate for domestic currency loans. In CEE, however, an important share of domestic lending is denominated in foreign currencies, in particular in euro. Therefore, as the second approximation we use a weighted average of interest rates on domestic and foreign currency (euro) loans (equation (1c)). Finally, as a more precise measure of the cost of housing loans we use interest series charged on housing loans proper (equation (1d)) rather than bank loans to households in general (which also include loans for purposes other than housing):

$$p^{house} = f(\overset{+}{capita}, \overset{-}{r_{FX\&NCU}}) \quad (1c)$$

$$p^{house} = f(\overset{+}{capita}, \overset{-}{r_{FX\&NCU_hsg_loans}}) \quad (1d)$$

To this baseline specification we add, one by one, six complementary control variables: housing credit as a percentage of GDP (c^{house}), and, because of a possible multicollinearity between GDP per capita and housing loans, we also estimate an equation including only housing loans; the stock market index (sm), to capture the influence of equity prices on house prices via wealth effects induced by changes in equity prices, or as an investment alternative to real estate; and three variables relating to the labor market and demographic factors – the unemployment rate (u), the share of working-age population in total population (pop), and the share of the labor force in total population (lf).

$$p^{house} = f(\overset{+}{capita}, \overset{-}{r_{ir}}, \overset{+}{c^{house}}) \quad (2a)$$

$$p^{house} = f(\overset{-}{r_{ir}}, \overset{+}{c^{house}}) \quad (2b)$$

$$p^{house} = f(\overset{+}{capita}, \overset{-}{r_{ir}}, \overset{+}{sm}) \quad (3)$$

$$p^{house} = f(\overset{+}{capita}, \overset{-}{r_{ir}}, \overset{-}{u}) \quad (4)$$

$$p^{house} = f(\overset{+}{capita}, \overset{-}{r_{ir}}, \overset{+}{pop}) \quad (5)$$

$$p^{house} = f(\overset{+}{capita}, \overset{-}{r_{ir}}, \overset{+}{lf}) \quad (6)$$

The defining and collecting of data that would capture the transition-specific factors described in section 3 presents obvious problems. Regarding housing quality data, the main shortcomings are low frequency, the short time

¹⁵ We thank an anonymous referee for drawing our attention to this issue.

span covered and the incomplete geographical coverage of underlying data used to calculate the real value of newly constructed housing shown in chart 4. Instead of this variable we use nominal construction costs (*cc*) as a proxy for changes in housing quality. A major component of these costs – wages in the construction sector – partly reflects the catching-up process resulting from differential productivity growth in tradable and nontradable sectors (the Balassa-Samuelson effect). In this interpretation, rising construction costs are a manifestation of the same catching-up phenomenon in CEE that instigates improvements in housing quality.

$$p^{house} = f(\overset{+}{capita}, \overset{-}{rir}, \overset{+}{cc}) \quad (7)$$

Another variable that might capture the impact of improved quality on house prices is the growth of per capita GDP, given that households normally demand better quality housing as their income rises.

We also include real wages in another specification:

$$p^{house} = f(\overset{+}{capita}, \overset{-}{rir}, \overset{+}{rwage}) \quad (8)$$

The proxy that we use to capture the effects of external demand on changes in house prices in CEE is monetary aggregates (*monag*). Sales of housing to foreign residents are typically settled in cash and should therefore be reflected in an increase in bank deposits. Clearly, this is an imperfect measure because movements in bank deposits contain a lot of “noise” from transactions unrelated to property sales to nonresidents.

$$p^{house} = f(\overset{+}{capita}, \overset{-}{rir}, \overset{+}{monag}) \quad (9)$$

Finally, the European Bank for Reconstruction and Development (EBRD) compiles a number of transition indicators that are potentially relevant for measuring the pace of development of housing markets and housing finance: (1) banking reform, and (2) security markets and nonbank financial institutions:

$$p^{house} = f(\overset{+}{capita}, \overset{-}{rir}, \overset{+}{reform}) \quad (10)$$

In addition, we use different credit growth series to partly capture these institutional effects, given that the evolution of housing loans clearly reflects the restructuring of the housing market and housing finance in CEE.

Despite its obvious importance, this paper will not address the issue of equilibrium or potentially excessive growth of house prices in CEE. First, using model estimates (including estimates for the transition economies in our case) to assess price misalignments would have a number of methodological drawbacks in the presence of initial undershooting (see e.g. Maeso-Fernandez, Osbat and Schnatz, 2005). Second, the out-of-sample panel approach, i.e. using the estimation results obtained for the OECD countries to derive misalignments for the CEECs, is not really feasible. Such an exercise would require a full data set on house price levels throughout the sample period, which is not available for a number of countries considered. For example, Australia, Austria, Belgium, Canada, Denmark, Germany, Greece, the Netherlands, Portugal and Sweden only publish time series for house price indices, but not any data on *levels* of house prices (in euro per square meter) at

a quarterly or monthly frequency. In fact, among small OECD countries, which could be taken as a natural long-term benchmark for CEE, only two countries (Finland and Ireland) publish such data.

Nonetheless, by looking at coefficient estimates on GDP per capita we can shed some light on the adjustment away from initial undershooting and the extent of possible overshooting. Said estimates would be higher if these phenomena were present. If house price developments were completely disconnected from fundamentals as a result of a correction of an initial undershooting or a bubble, it would not be surprising if we established the absence of any statistical relationship between house prices and GDP per capita.

4.2 Data and Country Sample Issues

Our data set comprises quarterly data covering 27 countries and grouped into two main panels: developed OECD countries and CEE transition economies. The (non-CEE) OECD panel is further split into three subpanels: large OECD countries (large OECD),¹⁶ small OECD countries (small OECD)¹⁷ and the four catching-up OECD countries Greece, Ireland, Portugal and Spain (catching-up 4). The CEE panel consists of eight transition economies. We further split this sample into two subgroups: countries with low or moderate increases in house prices (Croatia, the Czech Republic, Hungary and Poland) and countries where the rise in house prices has been more substantial (Bulgaria, Estonia and Lithuania) or sustained over a long period (Slovenia, since 1996).

Data on *house prices* expressed in domestic currency terms for non-CEE OECD countries are mostly obtained from the BIS Data Bank and Datastream; data for the transition economies stem from the respective national central banks and statistical offices.

Data on GDP *per capita* in purchasing power standards, at current euro exchange rates and at constant prices in domestic currency terms, are obtained from the European Commission's yearly database AMECO.

Interest rates relate to nominal lending rates and are obtained from the IMF's International Financial Statistics (IFS). Data on interest rates for the transition economies represent weighted averages of lending rates on domestic and foreign currency loans. Given that complete data series on interest rates on foreign currency loans are not available, these data are proxied by the three-month euro area money market rate (obtained from Eurostat's NewCronos). The weights used represent the respective shares of domestic and foreign currency loans in total housing loans. For most of the countries, lending rates refer to the whole economy. For the transition economies (but not for the EU-15), Eurostat also provides data on lending rates on new housing loans.

Inflation rates for the calculation of real interest rates stem from the IFS. CPI data for calculating real house prices and real interest rates are obtained

¹⁶ France, Germany, Japan, U.K., U.S.A.

¹⁷ Austria, Belgium, Finland, Greece, Ireland, the Netherlands, Portugal and Spain from the euro area plus Denmark, Norway, Sweden, Australia, Canada and New Zealand.

from the wiiw's monthly database for CEE (except Estonia and Lithuania) and from the IMF's IFS for the rest of the sample.

Housing loans in OECD countries are approximated by total private loans as a share of GDP, using IFS data. For Bulgaria, Croatia, the Czech Republic, Estonia, Hungary and Poland we were able to collect data on housing loans from central bank websites. However, the data series only start in 1999 for Croatia and in 2000 for Hungary, respectively. For these two countries, we extended the housing loan series to match the span of the house price series using data on loans to households for Croatia and on private credit for Hungary. For Lithuania and Slovenia, central banks only provide data on lending to households but not on housing loans.

The *stock market indices* are drawn from Datastream. The series of *nominal exchange rates* against the euro for the transition economies are obtained from the wiiw's monthly database.

Labor market data come from the IFS (unemployment rates) and the AMECO database (share of population aged between 16 and 64, and share of labor force in total population; both data series are annual and are interpolated linearly from yearly to quarterly frequencies).

Construction costs are obtained from Eurostat's NewCronos database. The country coverage is not complete (data are missing for six OECD and two CEE countries). As a result, we use this variable only for the OECD and CEE samples, but not for country subgroups.

Real wages are based on nominal wages for the whole economy, obtained from the BIS and the IMF's IFS, deflated by CPI.

Monetary aggregates used are M2 for the CEECs (M3 for Croatia), harmonized M3 for the euro area, and M2 or M3 (depending on availability) for other OECD countries. These data were retrieved from the wiiw's monthly database (for CEE), national sources (for the euro area) and Datastream (for other OECD countries).

EBRD structural indicators were obtained from the EBRD and are interpolated linearly from annual to quarterly frequency. The indicator on banking sector reform does not change for Hungary from 1997 on. The same applies to the indicator related to the development of security markets and nonbank financial institutions for Slovenia after 1997. As there is no variation in the series, we cannot include those countries when using the considered variable.

The data set is unbalanced, as the length of the individual data series largely depends on data availability. The sample begins between 1975 and 1994 for the non-CEE OECD countries, and between 1993 and 1998 for the transition economies; it ends in 2005. All data are transformed into logs with the exception of real interest rates.

4.3 Estimation Techniques

It is important to check whether the series under observation are stationary in levels. For this purpose, we employ four panel unit root tests: the Levin, Lin and Chu (2002) (LLC), the Breitung (2000), the Hadri (2000) and the Im-Pesaran-Shin (2003) (IPS) tests. The first three assume common unit roots across panel members, whereas the IPS test allows for cross-country heterogeneity. The Hadri test considers the null of no unit root against the

alternative hypothesis of a unit root, whereas the remaining tests take the null of a unit root against the alternative hypothesis of no unit root.

The panel unit root tests¹⁸ are carried out for level, first-differenced and second-differenced data. While in general, all panel unit root tests usually come to the conclusion that the series are I(1) processes, some of the tests show that a few series are I(0) or I(2). But given that there is no overwhelming evidence that they are really stationary in levels or in second differences, we assume that the series under study are stationary in first differences.

Against this background, the coefficients of the long-term relationships are obtained using panel-dynamic OLS (ordinary least squares) estimations that allow for cross-country heterogeneity both in the short-run dynamic coefficients and in the long-run coefficients. The mean group panel-dynamic OLS estimator accounts for the endogeneity of the regressors. This is a very useful feature, as some of the explanatory variables such as housing loans may be endogenous (see e.g. Hofmann, 2001). It also corrects for serial correlation in the residuals in the simple OLS setting by incorporating leads and lags of the regressors in first differences. The panel DOLS (dynamic ordinary least squares) can be written for panel member i as follows:

$$Y_{i,t} = \alpha_i + \sum_{h=1}^n \beta_{i,h} X_{i,t} + \sum_{h=1}^n \sum_{j=-k_{i,1}}^{k_{i,2}} \gamma_{i,j} \Delta X_{i,t-j} + \varepsilon_{i,t} \quad (9)$$

where $k_{i,1}$ and $k_{i,2}$ denote leads and lags, respectively, and the cointegrating vector β' contains the long-term coefficients of the explanatory variables (with $h = 1, \dots, n$) for each panel member i . The Schwarz information criterion is used to determine the optimal lag structure.

We use the mean group error correction term obtained from the error-correction specification as a test for cointegration. A negative and statistically significant error correction term is taken as evidence for the presence of cointegration:

$$\Delta Y_{i,t} = \alpha_i + \rho_i (Y_{i,t-1} + \sum_{h=1}^n \beta_{i,h} X_{i,t-1}) + \sum_{h=1}^n \gamma_{i,h} \Delta X_{i,h,t} + \varepsilon_{i,t} \quad (10)$$

where ρ is the error correction term.

5 Estimation Results

Owing to space constraints, table 3 shows only the results for the two large panels. Where relevant, results for the subpanels are discussed in the text. The existence of long-term relationships that connect house prices to a set of fundamentals is checked by using the error correction terms derived from the estimated error correction model. As explained earlier, one can establish a cointegrating vector in the event that the error correction term is statistically significant and has a negative sign. Indeed, all error correction terms reported in table 3 fulfill this double criterion. This suggests that house prices and the selected explanatory variables stand in a long-term relationship.

A striking feature of the results is the large difference in the size of the error correction terms for the non-CEE OECD countries on the one hand and

¹⁸ Not reported here because of space constraints.

CEECs on the other. While the error correction terms range from -0.01 to -0.15 for the non-CEE OECD countries, depending on which subgroup is considered, they amount to between -0.3 and -0.7 for the CEECs. This indicates a much higher speed of adjustment to equilibrium in the case of the transition economies than for the non-CEE OECD countries.

The estimated long-run coefficients of explanatory variables displayed in table 5 point to several interesting conclusions. First, GDP per capita is highly significant and has the expected positive sign. However, there its size differs widely across countries, with estimates for the transition economies generally being higher than those for non-CEE OECD countries.

In particular, transition countries with low or moderate house price increases have coefficient estimates comparable to those for small non-CEE OECD countries. CEECs with high house price inflation record much higher estimates of the GDP coefficient, which are well above unity. The four catching-up countries of the “old” EU-15 (Greece, Portugal, Spain and Ireland) are somewhere between the two groups of transition economies.

Regarding the impact of real interest rates on house prices, the results are fairly robust. The estimated coefficients almost always have the expected negative sign. Coefficients tend to be quantitatively higher in CEE but are not always significant. For CEECs with low house price growth, a negative sign appears only if we use interest rates on housing loans, weighted by the shares of domestic and foreign currency housing loans (rir mix 2). Interestingly, the sign of coefficient on nominal interest rates is either positive or not significant.

Credit to the private sector bears a strong positive relationship to house prices in the non-CEE OECD countries. In transition economies, an increase in private sector credit is associated with higher house prices only in countries experiencing high house price inflation. In countries with low house price inflation the relationship between credit growth and house prices is negative. However, as in the case of real interest rates, when we use a more precise measure of credit, namely housing loans proper, the coefficient on housing loans becomes highly significant, with a positive sign even for the group of countries with low house price inflation.

One should also note that the inclusion of housing loans in the estimated equation significantly reduces the size of the coefficient on GDP per capita or even reverses its sign. Also, if the credit variable is included separately in the equation, the size of the estimated coefficient usually increases. This indicates possible multicollinearity between these two variables. Multicollinearity is also a serious issue when real wages and the EBRD structural indicators are used in the equations. This suggests that one should not include GDP per capita and the considered variables in the same equation.¹⁹

Coefficient estimates for population, labor force and unemployment variables are all significant and have the right sign for the non-CEE OECD countries, confirming the findings of earlier empirical research. In the CEECs,

¹⁹ Note that the inclusion of other control variables does not produce the typical signs of multicollinearity, i.e., one variable becoming insignificant and switching the sign.

Table 3

Estimation Results – Long-Term Relationships

Dependent variable: real house prices

All non-CEE OECD countries

	Eq1a	Eq1a	Eq1a	Eq1c	Eq1d	Eq1b	Eq2a	Eq2b	Eq2a	Eq2b	Eq3
capita (PPP)	0.434**					0.606**	0.360**				0.590**
capita (constant prices)		0.947**									
GDP (real)			0.640**								
rir	-0.003**	0.000**	-0.002**				-0.001**	-0.015**			-0.005**
nir						0.016**					
credit							0.294**	0.617**			
sm											-0.023**
unemployment											
pop											
lf											
cc											
rwage											
monag											
ECT	-0.073**	-0.082**	-0.084**			-0.071**	-0.085**	-0.046**			-0.077**
R2	0,68	0,73	0,68			0,71	0,75	0,69			0,76

All CEE economies

capita (PPP)	0.926**			1.172**	0.976**	1.140**	0.614**		-0.309**		0.673**
capita (constant prices)		1.381**									
GDP (real)			1.181**								
rir	-0.012**	-0.016**	0.002								
rir mix1				-0.009							
rir mix2					-0.013**		-0.023**	-0.012**	-0.008**	-0.015**	-0.013**
nir mix2						0.011**					
credit							-0.352	0.352**			
loan									0.308**	0.243**	
sm											-0.051
unemployment											
pop											
lf											
cc											
rwage											
monag											
banking sector											
financial sector											
ECT	-0.262**	-0.270**	-0.319**	-0.252**	-0.241**	-0.237**	-0.328**	-0.268**	-0.341**	-0.284**	-0.284**
R2	0,75	0,76	0,79	0,75	0,74	0,77	0,80	0,75	0,85	0,77	0,81

Source: Authors' calculations.

Note: * and ** indicate statistical significance at the 10% and 5% significance levels, respectively. Abbreviations: see section 4.1. ECT = error correction term.

Table 3

Estimation Results – Long-Term Relationships (continued)

Dependent variable: real house prices

All non-CEE OECD countries

	Eq4	Eq5	Eq6	Eq7	Eq8	Eq8'	Eq9	10	10	10	10
capita (PPP)	0.467**	0.507**	0.459**	0.486**	0.768**		0.359**				
capita (constant prices)											
GDP (real)											
rir	0,01	-0.005**	-0.003**	0.004**	-0,01	-0.002**	0,01				
nir											
credit											
sm											
unemployment	-0.197**										
pop		4.456**									
lf			1.065**								
cc				0.130**							
rwage					-0.002**	0.009**					
monag							0.010**				
ECT	-0.106**	-0.099**	-0.084**	-0.131**	-0.091**	-0.057**	-0.120**				
R2	0,80	0,80	0,75	0,94	0,84	0,78	0,83				

All CEE economies

capita (PPP)	0.658**	1.104**	1.084**	0.097	8.343**		-1.002**	13.568**		1.876**	
capita (constant prices)											
GDP (real)											
rir											
rir mix1											
rir mix2	-0.017**	-0.001	-0.010**	-0.012**	-0.031**	-0.046**	-0.011**	0.039	-0.037**	-0.028**	-0.041**
nir mix2											
credit											
loan											
sm											
unemployment	-0.186										
pop		12.496**									
lf			-1.211								
cc				1.280**							
rwage					-0.084**	0.015**					
monag							0.000**				
banking sector								-15.910**	1.211**		
financial sector										-2.685**	1.807**
ECT	-0.327**	-0.361**	-0.327**	-0.613**	-0.285**	-0.167**	-0.359**	-0.291**	-0.147**	-0.350**	-0.146**
R2	0,88	0,90	0,88	0,86	0,82	0,72	0,82	0,82	0,70	0,76	0,65

Source: Authors' calculations.

Note: * and ** indicate statistical significance at the 10% and 5% significance levels, respectively. Abbreviations: see section 4.1. ECT = error correction term.

however, it is not possible to establish a clear and robust relationship between these demographic and labor market variables and house prices.

House prices in non-CEE OECD countries are also positively correlated with stock prices. In CEE, house prices are positively correlated with stock prices only in countries with high house price inflation. Elsewhere, the sign of the stock market variable is often negative, which could indicate a substitution effect rather than a wealth effect of equity prices on house prices. However, it is more likely that the lack of relationship between equity prices and house prices reflects the low share of equities in total financial wealth in CEE and the relatively important role of foreign investors in CEE stock markets.

Construction costs are positively correlated with house prices in both OECD and CEE economies. Their impact is quantitatively more important in CEE (coefficient = 0.489) than in the non-CEE OECD countries (coefficient = 0.109).

Regarding the potential impact of external demand on house prices, the long-run relationship between house prices and monetary aggregates used as a proxy for this demand is highly significant. While this could in principle show foreign demand to be at play, the result needs to be interpreted with caution, given that the coefficient estimates tend to be considerably higher in non-CEE OECD countries than in CEE.

6 Concluding Remarks

This paper studies the determinants of house price dynamics in the CEE transition economies and in non-CEE OECD countries. In addition to analyzing the role of traditional fundamentals like GDP per capita, interest rates and demographic factors, we underline the importance of a number of transition-specific factors. In particular, we argue that improvements in the quality of newly constructed housing, the transformation of housing market institutions and housing finance, and growing external demand for housing are key to understanding developments in house prices in the region.

We test these hypotheses on a sample of eight transition economies (Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Lithuania, Poland and Slovenia), drawing on different panels composed of non-CEE OECD and transition economies. We obtain very high coefficient estimates on GDP per capita in those CEECs that have experienced a rapid or more sustained growth of house prices (Bulgaria, Estonia, Lithuania and Slovenia). We argue that this result might reflect a correction of the initial undervaluation of house prices or of subsequent overshooting.

We establish a robust relationship between real interest rates and house prices. This required the use of a precise measure of interest rates (weighted average of interest rates on domestic and foreign currency housing loans). Our results also show that the growth of housing loans plays an important role in house price dynamics, both in transition and OECD economies. Again, this result is obtained when the correct measure of housing loans is used.

Our results indicate that so far, house prices in transition economies have been less influenced by developments in equity prices, demographic factors and labor market developments than in non-CEE OECD economies.

Yet within our data set it was not possible to fully assess the effects of quality improvements, which seem to have played an important role in the growth of house prices in CEE. Quality effects may be captured by the higher coefficients of the GDP-per-capita variable.

The long-run relationship between house prices and monetary aggregates used as a proxy for external demand for housing in CEE is highly significant. However, this result might also reflect a number of factors unrelated to sales of property to nonresidents that are captured by changes in monetary aggregates.

In summary, the analysis presented in this paper suggests that the growth in house prices in Central and Eastern Europe can be explained fairly well by the development of conventional underlying fundamentals and transition-specific factors.

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Appendix

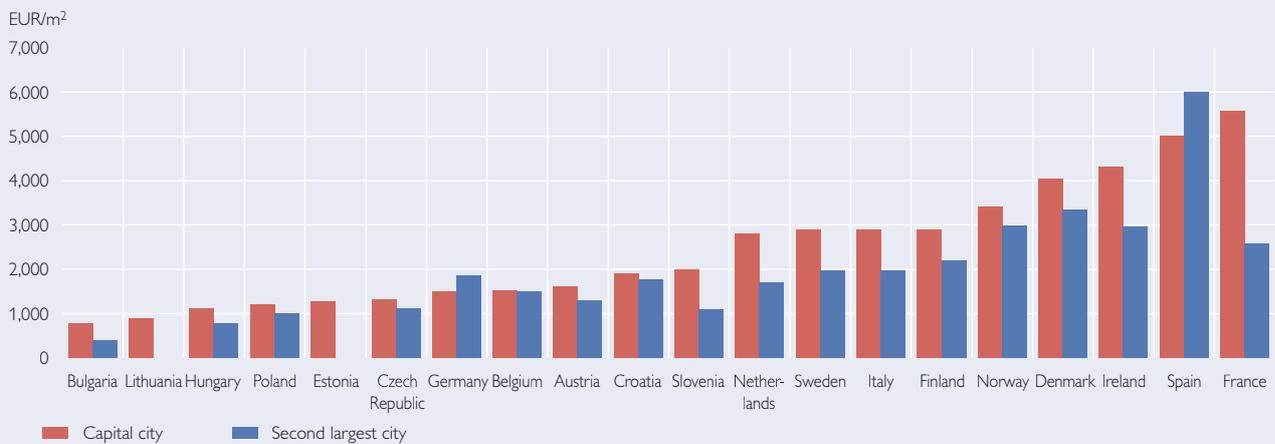
Box 1

House Prices in Transition and Non-CEE OECD Economies

House prices in euro per square meter are considerably lower in Central and Eastern Europe than in Western Europe. In 2005, average house prices in Bulgaria, Estonia and Lithuania were about four times lower than those in Italy, Finland, the Netherlands and Sweden and six to seven times lower than those in Spain and France (Chart A1). These orders of magnitude are broadly in line with the discrepancies in per capita GDP levels (expressed in purchasing power standards) between the “new” and “old” EU Member States, which reflects the lower level of economic development in CEE.

Chart A1

Average House Prices (2005)



Source: National data, national central banks, Datastream, real estate companies.

Nevertheless, when house prices are compared across some of the capital cities under review, these differences narrow significantly and sometimes even disappear. In 2005, one square meter of housing in Budapest, Prague or Warsaw cost just 20% to 30% less than in Berlin, Brussels or Vienna; in Ljubljana and in Zagreb, average house prices were the same or higher than in the latter three Western capitals (chart A1). This phenomenon results from the increasing concentration of economic activity, especially the booming service industries, in urban areas in the CEECs. Urban land prices – and, by extension, urban house prices – thus often increase much faster than house prices in nonurban areas.

Country and authors	Elasticity of real house prices			Methodology, comments
	Real disposable income	Real interest rate	Other factors	
Euro area Annett (2005)	0.1 to 1.4 short-run impact	-0.01 to -0.03 short-run impact	Real credit 0.1 to 0.2 Real money 0.4 to 0.6	Panel regressions for subgroups of countries based on common institutional characteristics, short- to medium-run equations. Institutional factors help explain the relationship between credit and house prices. VaR model, from the 1970s to the first quarter of 2002.
Six industrial countries Sutton (2002)	GNP 1 to 4 after 3 years	-0.5 to -1.5, weaker for longer rates	Equity prices 1 to 5 after 3 years	
17 countries (grouped on mortgage finance structures) Tsatsaronis and Zhou (2004)	Accounts for < 5% of total variation in house prices after 5 years	Accounts for < 11% of total variation in house prices after 5 years	Inflation accounts for 50%; bank credit and term spread each account for >10% of total variation in house prices after 5 years	VaR model, 1970-2003. Mortgage market structures have an impact on the sensitivity of inflation to interest rates and the strength of the bank credit channel.
18 countries Terrones and Otrok (2004)	0.5 to 1.1	-0.5 to -1.0	Housing affordability (t-1) -0.1 House price (t-1) 0.5 Real credit 0.1 Population growth 1.8 Bank crisis -2.4	Dynamic factor model, from 1980 to the first quarter of 2004. Real house prices show high persistence, long-run reversion to fundamentals and dependence on economic fundamentals. Real house prices are strongly procyclical; average correlation with output (consumption) declined since the mid-1990s. House prices in industrial countries tend to move in line and have become more synchronized in the 1990s.
Ireland Rae and van den Noord (2006)	1.8	-1.9	Housing stock supply -2.0 (new) to -0.007 (existing)	ECM, from 1977 to 2004 for new and existing houses. The sharp increase in the price of existing houses relative to that of new houses since the mid-1990s partly reflects supply constraints. Short-run income elasticities are high.
Netherlands OECD (2004)	1.9	-7.1	Housing stock supply -0.5	High growth in real house prices mainly attributable to weak supply response.
Spain Ayuso et al. (2003), Banco de España (2004)	2.8	-4.5 (in nominal terms)	Equity market return -0.3	ECM, 1989-2003. Estimated overvaluation increases over time.

Source: Adapted from Girouard et al. (2006, pp. 11-15).

Are Euro Cash Holdings in Central and Eastern Europe Driven by Experience or Anticipation?

Results from an OeNB Survey

Although euroization is an important phenomenon in emerging markets, still very little is known about who holds how much euro and for what purposes. In this paper, we employ unique survey data to analyze various aspects of foreign currency holdings in five Central and Eastern European countries (CEECs). This allows us to study the impact of expectations and hysteresis on individual behavior. Our results show that a substantial share of the population in the countries under review holds euro cash. We find little evidence that inflation or exchange rate expectations are important determinants of euroization, whereas variables related to a country's economic history seem to be of some significance. Our results also indicate that the demand for euro and its use in domestic payments increases as the date of euro adoption approaches.

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1 Introduction

In emerging market economies, quite many people hold foreign currencies. Typically, they do so for a wide variety of purposes, e.g. for carrying out transactions, either at home or abroad, for storing value or for speculation. Currency substitution is, however, not restricted to cash – a significant share of deposits but also loans is denominated in foreign currencies.

Currency substitution has long been an issue in many CEECs.⁴ In the 1970s and 1980s, for instance, hard currencies (mainly German mark and Austrian schillings) entered the former Yugoslavia owing to tourism and remittances. Other countries were affected by this development more recently, with hyperinflation, currency devaluations or bank failures during and right after the initial transition process giving rise to distrust in the respective national currencies.⁵

Notwithstanding the importance of foreign currencies in some countries, estimates about the degree of cash substitution are rare. This is due to the very nature of cash, given that banknote shipment data do not allow making reasonable estimates about the degree of cash substitution. To overcome this problem, several different indirect measurement methods have been proposed.⁶ Another option is to rely on surveys. Although survey results typically yield a significant underestimation of foreign currency amounts, they have the advantage of delivering data on various behavioral aspects in relation to

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³ The authors thank anonymous referees as well as Peter Backé, Stefan Barisitz, Evan Kraft, Peter Mooslechner, Zoltan Walko and Anton Schautzer for helpful comments and suggestions.

⁴ Feige (2003) offers a comprehensive overview of currency and asset substitution. He finds very high rates of de facto dollarization for several countries of the Commonwealth of Independent States, whereas the rates are more moderate in CEECs. Rates in excess of 50% were only identified for Croatia, Macedonia and Romania. The lowest de facto dollarization (below 20%) is found for the Czech Republic, Hungary, Poland and Slovakia.

⁵ For a general discussion of currency substitution, see e.g. Calvo and Végh (2002).

⁶ For examples of methods proposed in the literature, see Fischer, Köhler and Seitz (2004), Porter and Judson (1996) and Šošić (2007).

foreign currency holdings. These data are especially interesting in the CEECs for two reasons: First, the CEECs' macroeconomic situation has more or less constantly improved over the past few years, and second, they were confronted with a major change in the monetary regime in their direct neighborhood – European Monetary Union. As a consequence, the number of foreign currencies available as a substitute for the domestic currency diminished, creating several special changeover effects. Monetary union has, however, also had a significant influence on the CEECs' national monetary policy strategies and perspectives.

The Oesterreichische Nationalbank (OeNB) has a special research focus on the CEECs, and it has been heavily affected by the logistical aspects of cash substitution. This is why the OeNB has, since 1997, commissioned several surveys on foreign currency holdings in five CEECs.⁷ Some of their results concerning currency substitution are presented in this paper. In a nutshell, we aim at shedding some light on the question who holds how much euro and for what purposes.⁸

This paper is organized as follows: Section 2 gives an overview of the reasons for cash substitution in CEECs, while section 3 discusses empirical evidence on the extent of cash substitution in the region. Given that the OeNB surveys have been conducted for ten years, we can analyze trends that were observed during the transition process in the respective countries and during the creation of the euro area in their direct neighborhood. In section 4, we present evidence on certain reasons for holding euro cash, focusing, in particular, on the following question: Is it experience that determines the extent of cash substitution at the individual level (i.e. country-specific past events, e.g. currency crises or periods of high inflation) or anticipation (i.e. expectations about the timing of euro introduction, expected inflation or exchange rate movements). Section 5 concludes.

The five countries covered by the OeNB survey – Croatia, the Czech Republic, Hungary, Slovakia and Slovenia – display similarities but also differences. The similarities include their strong economic linkages to the EU-15 and their small and medium size. Differences exist with respect to the progress of European integration: Slovenia, having fulfilled the convergence criteria, introduced the euro on January 1, 2007, whereas Croatia is not even an EU Member State yet. The Czech Republic and Hungary have recently postponed euro introduction to 2010 or even beyond; both countries still use the exchange rate instrument. Slovakia, by contrast, has been an ERM II

⁷ Survey results are published in Stix (2001, 2002 and 2003). An overview can be found in ECB (2005).

⁸ It should be noted that we focus on unofficial euroization. Unofficial (or *de facto*) euroization is broadly used to indicate that the euro is used alongside the national currency but is not legal tender. In contrast, official (or *de jure*) euroization occurs when the monetary authority of a country decides to grant the euro the usually exclusive legal tender status. Prominent (albeit small) examples are Kosovo and Montenegro in the Western Balkans, where the U.N. interim administrations introduced first the German mark and then the euro mainly because of the lack of established monetary authorities. And although some economists argue in favor of a unilateral euroization for pre-ins, i.e. EU member countries that have not yet adopted the single currency, (Portes, 2001; Belke et al, 2002) and Southeastern European (SEE) countries (Levy Yeyati, 2005), it is not very likely that the number of such cases will increase, as it contradicts the three-stage concept on which introduction of the euro is built within the EU framework.

member since November 2005, but due to relatively high exchange rate volatility, the timing of euro adoption is still an open question.

2 Currency Substitution in the CEECs – an Overview of Explanations

2.1 Low Confidence in the Domestic Banking System

De facto euroization is often a response to a history of banking crises or of political influence on banks, which sometimes even led to the confiscation of bank deposits. For instance, in the former Yugoslavia, households were allowed to hold a foreign currency deposit to store remittances or earnings from tourism. When the central state needed the reserves (first for funding prestigious projects and later for financing the war), the deposits were converted to domestic currency. Even though the interest rate was high at the time, the real value of the deposits was eroded quickly by the high inflation rate (Barisitz, 2003).

In many transformation countries, two waves of crisis occurred in the banking sectors. The first one was in 1992/1993, when the transformation process started and the existing one-tier systems were abolished.⁹ In fact, the state-owned central banks, which were also active in the banking business segment, were split up into “pure” central banks and state-owned commercial credit institutions. In parallel, market-oriented commercial banks were established from scratch.

In many cases the newly created two-tier systems were not sustainable, and another wave of crisis followed in the late 1990s. Examples are the Czech Republic, Bulgaria, Romania and Slovakia (from 1996 to 2001). The consolidation of the state-owned banking sector was brought about by the closing down of unprofitable institutions (see e.g. Croatia), but also by enhanced privatization efforts. Several foreign banks, mainly from Austria, Italy and the Netherlands, entered the CEE banking markets. They mostly acquired already existing domestic banks, but also started a few greenfield investments. Overall, the share of foreign banks is significant in most countries, reaching almost 100% in a few of them. This development has counteracted the above-mentioned skepticism and has convinced many people to refrain from holding cash, in particular when their opportunity costs in the form of lost interest income would have become too high otherwise.

Especially when the German mark and the Austrian schilling were replaced by euro banknotes and coins in January 2002, cash reserves in the CEECs were switched mainly into euro.¹⁰ As people’s trust in the newly established national banking systems had increased, many took the opportunity to open a bank account. In some countries, they were even obliged to do so, as the conversion to euro of assets denominated in the euro’s constituent currencies was only allowed via a bank account. This led to a marked increase in the number of foreign currency deposits.

⁹ Yugoslavia had a two-tier system already in the 1970s under the Tito regime.

¹⁰ The OeNB survey revealed that on average, about 71% of the respondents exchanged their German mark holdings for euro, 21% for local currencies, 4% for U.S. dollar, 1% for Swiss franc and 2% for other currencies.

2.2 Tourism, Remittances and Banknote Migration

In several republics of the former Yugoslavia, tourism played an important role already in the 1970s and 1980s. Given the special structure of the low-price segment (mainly private dwellings were offered for rent) and the restriction for the local population to buy foreign currencies, the volumes of privately held foreign currency reserves (mainly DEM, but also ATS and SFR) were substantial. Households used the hard currencies for importing goods that were not available domestically or as a store of value.

Emigration, mainly to Germany and Austria, but also to other industrialized European countries, provided another source of foreign currency. The associated remittances from abroad were often not converted in domestic currency, given the lack of confidence in the domestic financial sector. With the fall of the iron curtain, the opening up of the borders and EU membership, many people started to migrate daily, and thus constituted another group of people who stored value in euro.

The CEECs belong to those countries in which remittances play a significant role, regardless of the measure chosen to assess the remittances volume (OECD, 2006). Among the top 30 emerging market economies in terms of remittances received as a percentage of GDP (in 2002), we find Bosnia and Herzegovina (18.4%), Albania (15.6%) and Latvia (7.5%). The following CEECs are among the top 30 emerging market economies in terms of total remittances received (in U.S. dollar million; 2002 data): Poland (3,824), Ukraine (1,670), Romania (1,646), Croatia (1,400) and the Czech Republic (1,343). Owing to their quite advanced economic stage, the remittances sent to the CEECs are relatively high per capita (roughly 165% above the average of all emerging market economies).¹¹

Banknote migration data also confirm the key role of foreign currencies in the CEECs. Schautzer (2006) shows a strong net inflow of euro banknotes to Austria from its neighboring countries, mainly the Czech Republic, Hungary and Slovakia.¹² This inflow to Austria (which is nearly eight times as big as the outflow) is mainly attributable to geographical circumstances: Commercial banks from the CEECs are looking for the cheapest, and therefore shortest, way to dispose of their euro cash. Contrary to expectations, tourists from euro area countries account only for a minor share of cash inflow to Austria.

The findings of Schautzer (2006) are in line with an ECB report on the issuance of euro banknotes. The report shows that since 2003, the OeNB has issued fewer banknotes than it has received. While the vast majority of euro banknotes delivered to non-euro area countries were provided by the Deutsche Bundesbank, the bulk of returning banknotes were delivered to the OeNB. In fact, the number of returning banknotes was much higher than the capital key

¹¹ Country-by-country data by the OECD (2006) show that the following CEECs are among the top 30 emerging market economies in terms of the highest remittances per capita: Croatia (USD 320), Slovenia (USD 288), Latvia (USD 270), Bosnia and Herzegovina (USD 234), and the Czech Republic (USD 132).

¹² The 2004 data presented in Schautzer (2006) show that the inflow from the Czech Republic to Austria came to EUR 470 million, whereas the outflow from Austria was only EUR 53 million. The respective figures for Hungary are EUR 424 million (inflow) and EUR 89 million (outflow), and for Slovakia EUR 146 million (inflow) and EUR 17 million (outflow).

suggests. This implies that the OeNB has faced a substantial increase in its banknote sorting and redistribution activities.

2.3 Exchange Rate Regimes, Exchange Rate Developments and Inflation Expectations

Temporary or chronic macroeconomic instability, undermining the domestic currency's function as a store of value, can be another reason for currency substitution. Given that people are strongly affected by periods of hyperinflation, we can assume that such events will stay in their memories for a long period of time. As interest rates hardly offset inflation, cash holdings in foreign currency are a widely chosen alternative. Especially in the first half of the 1990s, the catching-up process in the CEECs went hand in hand with extraordinarily high inflation rates. Inflation was measured month to month, with some countries (e.g. Poland) even suffering from four-digit annual inflation rates. In the mid-1990s, inflation rates came to 30% to 40% in Hungary. At the end of the 1990s, the successor states to the former Yugoslavia, e.g. Croatia, still posted spells of high inflation.

The exchange rate is another macroeconomic indicator that determines the domestic currency's storage-of-value function. Exchange rate expectations are driven by several factors, one of them being the exchange rate regime in place. Most of the CEECs have fixed pegs, currency boards or managed floats. The only exception is Poland, which runs a pure float. As a result, nominal exchange rates have been extraordinarily stable, although surprises in either direction cannot be excluded, as the most recent history has shown in Slovakia or Latvia. In this vein, cash holdings in foreign currencies are often used as a safety net against exchange rate risks.

Moreover, euroization is a hysteretic phenomenon, reflecting the fact that yesterday's good news are forgotten quickly, whereas bad news have a tendency to stick in the mind. Therefore, it does not come as a surprise that the demand for hard currencies remains high in countries affected by euroization even after macroeconomic stabilization has been achieved (see e.g. Feige et al., 2003; Feige and Dean, 2004; Mourmouras and Russell, 2000). Given that strong currency movements occurred in the past in several CEECs, people will probably still keep an eye on exchange rate movements.¹³

3 Empirical Evidence

3.1 OeNB and Eurobarometer Surveys

Since 1997, the OeNB has commissioned representative surveys in Croatia, the Czech Republic, Hungary, Slovakia and Slovenia. For each survey about 1,000 persons above the age of 14 were interviewed per country in April/May and in October/November. The main focus of the surveys is to collect data on foreign currency cash holdings in the respective countries. In particular, the respondents are asked about their cash holdings in euro and U.S. dollar as well as about their motives for holding foreign currencies. Furthermore, the surveys

¹³ In fact, many countries were affected by sharp exchange rate movements (depreciations, but also appreciations). For instance, the currency crises in the Czech Republic (1997) and Slovakia (1998) were followed by sharp appreciations.

contain questions about exchange rate and inflation expectations, deposits safety, travel habits, the respondents' expectations regarding the timing of euro adoption, etc.¹⁴

The European Commission (EC) also commissioned several surveys in all new EU Member States, which were undertaken annually between 2004 and 2007. These so-called Eurobarometers on the introduction of the euro in the new Member States do not convey much information on foreign currency holdings. Still, they provide a first-hand view of the population's experience with, and perception of, the euro, of their expectations and fears concerning the adoption of the euro, etc.¹⁵ As in the OeNB survey, about 1,000 persons were questioned in each country. The first wave relied on face-to-face interviews, whereas the second and third waves were predominantly based on telephone interviews.

As the focus of the Eurobarometer surveys is different from that of the OeNB surveys, the results from both combined provide a rather comprehensive set of information on the role of the euro in some CEECs. For those few questions that cover similar aspects we will compare the results. The latest surveys used in this paper are from October/November 2006 (OeNB survey) and from March/April 2006 (EC survey).

It is a well-known fact that survey results in general must be interpreted with caution. They are influenced by sampling and interviewing techniques, the exact wording of the questions, etc. Also, random fluctuations can be sizeable if the number of observations is low. In particular, caution is required for those questions that are related to personal wealth (e.g. the amount of foreign money kept at home), as respondents will not always reveal the truth. Furthermore, the surveys do not cover commercial cash holdings (e.g. tourism revenues), and they certainly cannot cover criminal money. As a result, the estimated figures on foreign cash holdings are likely to understate the true amounts significantly.¹⁶ Therefore, the absolute figures indicated here should not be taken literally. Instead, we focus on changes over time and on relative differences across countries.¹⁷

3.2 General Results

3.2.1 Foreign Currency Cash Holdings

Chart 1 summarizes the evolution of foreign currency holdings as a percentage of respondents since 1997. It shows that in each of the countries under review, a substantial share of the population has held foreign currencies. Before the introduction of euro banknotes and coins, the German mark was the most frequently held foreign currency in the region. The Austrian schilling usually ranked second and was almost as popular as the German mark in some countries (notably Slovakia and Hungary), while the U.S. dollar ranked third.

¹⁴ The complete questionnaire is available upon request from the authors.

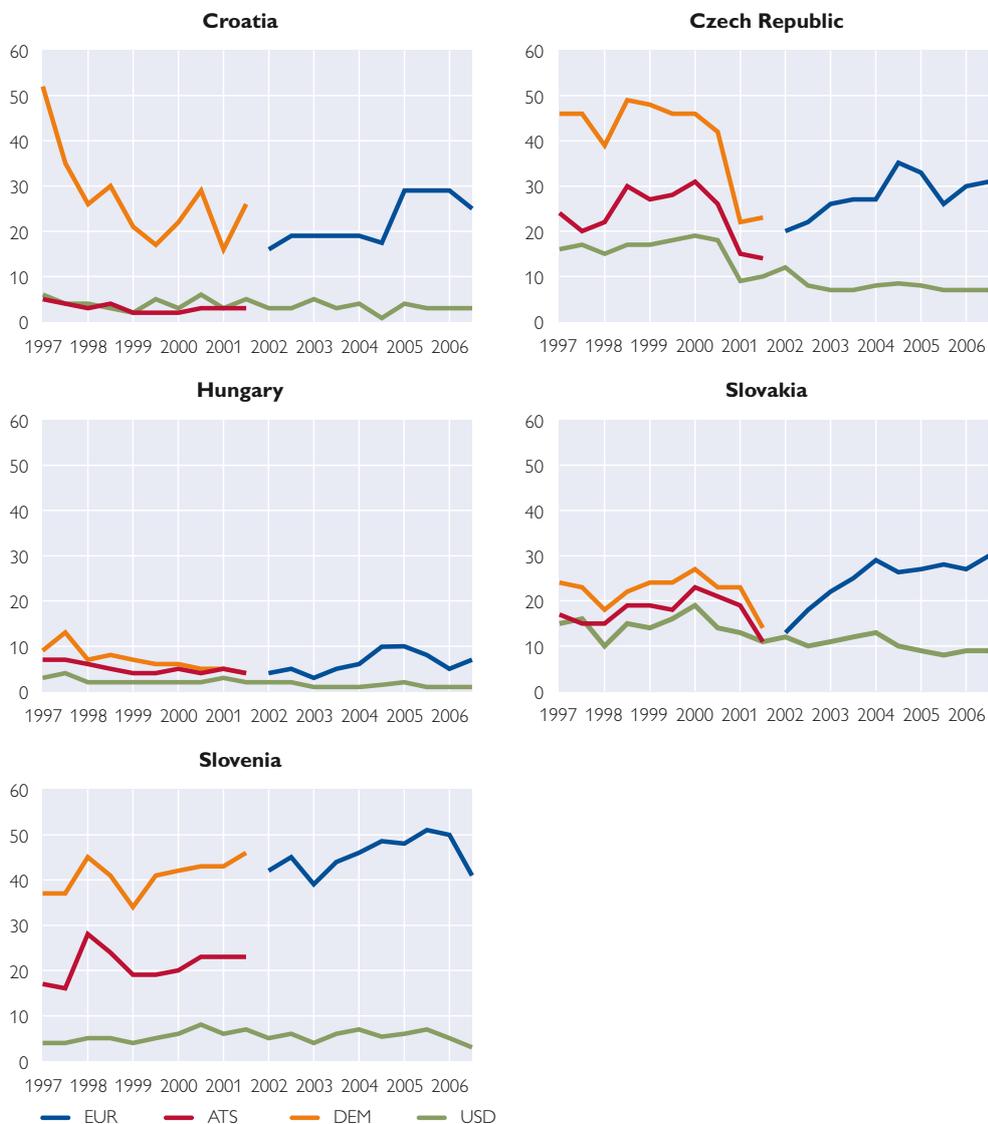
¹⁵ See the Appendix for more detailed information about the surveys used in this contribution.

¹⁶ Šošić (2007) provides relatively precise estimates of the amount of foreign currency in circulation in Croatia, using data from currency in- and outflows around the time of the euro cash changeover. The results of the OeNB survey for Croatia are lower than Šošić's estimates by a factor of five.

¹⁷ Provided that the surveys are conducted repeatedly and the respondents' underreporting behavior remains constant, temporal trends derived from the surveys should be relatively reliable.

Chart 1

Percentage of Respondents Holding Foreign Currency



Source: OeNB.

Croatia was an exception in this respect, with the U.S. dollar being the second-most important foreign currency. When the euro cash changeover approached, the share of respondents holding German mark declined (except in Slovenia).

The 2002 surveys revealed that in the course of the cash changeover, a substantial fraction of the stock of German mark, Austrian schilling and other euro area currencies that were in circulation in these five countries were exchanged into euro.¹⁸ A sizeable percentage of respondents exchanged their foreign currency holdings for local currencies, whereas only a low percentage converted their cash holdings to U.S. dollar (Stix, 2004).

¹⁸ For a more detailed discussion of the conversion in the five CEECs, see Stix (2002, 2004). In short, the exchange of German mark into euro was particularly strong in Croatia and Slovenia.

Before and around the euro cash changeover, the share of respondents holding foreign currency declined. After that, however, we observe an upward trend again more or less in all five countries under review (see chart 1). In Croatia, the share remained largely constant until the end of 2004 and increased thereafter.¹⁹ In the Czech Republic and Hungary, the share increased and declined again after 2005. In Slovakia, the share increased steadily and has remained relatively constant since 2004. In Slovenia, the share trended upward and declined only in the second wave of the survey in 2006. This drop might be related to the fact that Slovenia was about to introduce the euro in 2007. In absolute terms, some 41% of Slovenians, 31% of Czechs, 30% of Slovaks, 25% of Croats and 7% of Hungarians held euro in October/November 2006. In Slovakia and Slovenia, the percentage of the spring 2006 survey was higher than it had been for the German mark in any year since 1997 (when the surveys were started). In Croatia, it again reached the German mark levels of the late 1990s.

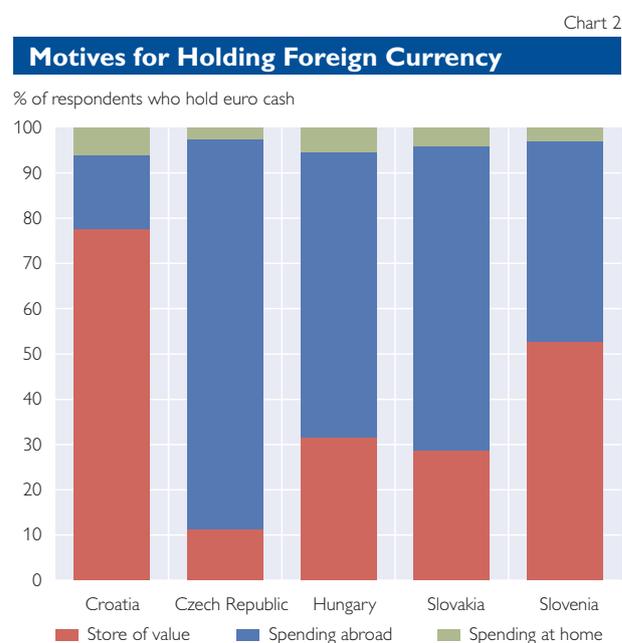
Chart 1 also shows the share of respondents holding U.S. dollar. In all countries, this share is substantially lower than the corresponding euro share. In addition, there is no clear trend discernible.

3.2.2 What Are the Motives behind Euro Holdings?

The OeNB surveys also collect information on the motives underlying the decision to hold euro (see chart 2). In particular, respondents were asked to choose their main motive for holding euro cash out of the following three answers:

as a store of value, for shopping abroad or for shopping at home.

The store-of-value motive is most important in Croatia and Slovenia, where it was decisive for 78% and 53% of euro holders, respectively. In the other countries, this motive was significantly less relevant (Hungary 31%, Slovakia 29%, Czech Republic 11%). The motive of making transactions abroad was chosen by 86% of euro holders in the Czech Republic, by between 60% and 70% in Hungary and Slovakia, and by 44% in Slovenia. The corres-



Quelle: OeNB.

Note: The question was "For which reason do you keep euro cash? Do you keep euro cash mainly ...?" The data are from 2006. Only valid replies are considered.

¹⁹ We cannot offer a good explanation for this increase nor are we aware of any institutional changes that would explain it.

ponding value in Croatia is only 16%. Finally, the results indicate that the motive of making domestic transactions was hardly ever chosen as a reason for holding foreign currency – only the results from Croatia and Hungary suggest that this motive is of some importance.

A comparison of the 2006 results with those from 2002 reveals some changes over time: In Croatia, the share of respondents who indicated that they hold foreign currency for domestic purchases declined from around 15% to 7%, while the store-of-value motive became more important. In all other countries, the store-of-value motive has lost importance. At the same time, the number of respondents who indicated that they hold euro for transactions abroad increased. Overall, this development can be seen as a reflection of increased confidence in the banking system and the domestic currency, of economic stabilization (disinflation policies), higher purchasing power and, consequently, the increased role of tourism.

3.2.3 Euro Amounts

The share of the population which has foreign currency holdings is certainly an important indicator. However, it is the amount of foreign currency circulating in these countries that is relevant from a monetary policy perspective. To obtain such estimates, respondents were asked to indicate the amount of foreign currency they hold.²⁰ Chart 3 shows the temporal evolution of the median euro amounts derived from the respondents' answers to this question.²¹ As the number of observations is quite low for some countries, the resulting figures can be subject to considerable random fluctuations (e.g. 5% of Hungarians said they hold euro so that the medians are calculated on a basis of only 50 observations per wave. For other countries like Slovenia, the results are based on 500 observations per wave).²² Therefore, we will not interpret individual figures but rather focus on the cross-country and the temporal dimensions.

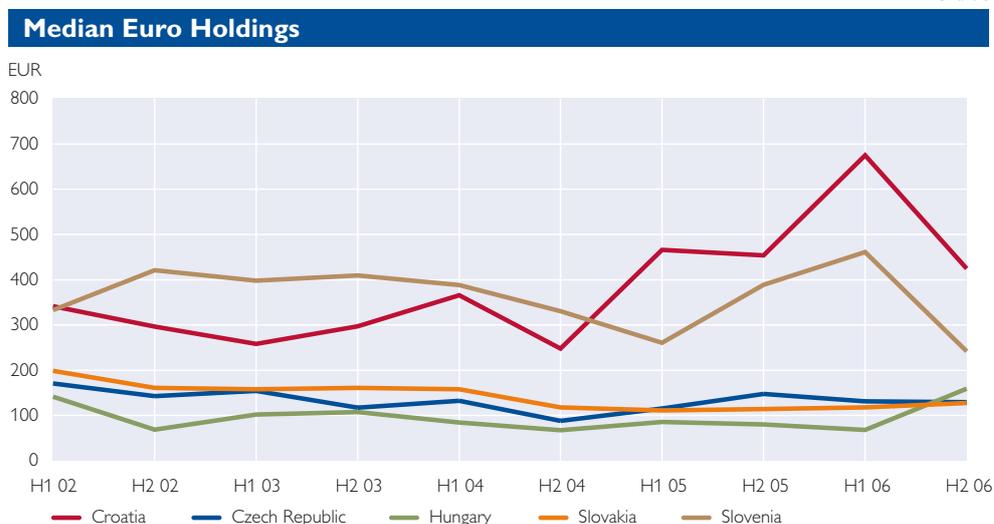
The highest median amounts were held in Slovenia and Croatia, countries in which the store-of-value motive is most important. The median amounts held by respondents from the Czech Republic, Slovakia and Hungary were roughly equal. Regarding the temporal dimension, we observe an increase in euro holdings in Croatia during 2005 and the first half of 2006 as well as a more moderate increase in Slovenia for the same period. In the second half of 2006, however, median amounts fall sharply in Croatia and Slovenia. No clear trend is discernible for the other countries.

²⁰ The survey does not ask about precise amounts but rather about categories (<EUR 20, EUR 20 to EUR 50, EUR 50 to EUR100, EUR 100 to EUR 250, etc.).

²¹ As the median can be calculated in various ways, we abstain from interpreting absolute figures. We have calculated the median amounts by linearly interpolating between class boundaries.

²² Notice that the median can be calculated in various ways. Therefore, we abstain from interpreting absolute figures. We have calculated the median amounts by linearly interpolating between class boundaries.

Chart 3



Source OeNB.

Note: Values are based on categorized answers. The median is calculated by linearly interpolating between category boundaries.

Table 1

Median Euro Amounts by Motive

	Store of value or domestic purchases in EUR	Spending abroad in EUR
Croatia	592	238
Czech Republic	270	120
Hungary	90	88
Slovakia	142	109
Slovenia	552	210

Source: OeNB survey.

Note: Median values are calculated by linearly interpolating between category boundaries. Aggregated data are from the first wave in 2005 to the second wave in 2006. The motives "as a store of value" and "for shopping at home" are aggregated into one category.

It can be expected that the amount held is determined by the motive for holding foreign currency. For instance, this amount should be lower if cash is held for the purpose of making purchases abroad (it may even include unspent cash from the latest visit to the euro area) rather than for hoarding. Table 1 shows median holdings broken down by the three motives. For Croatia, Slovenia and the Czech Republic, the results clearly show that those who hold euro as a store of value or for making purchases within their home countries typically keep higher amounts than those who hold euro for making purchases abroad. Only for Hungary and Slovakia, the median amounts are more or less equal in size.²³ Furthermore, an analysis of the mode, i.e. the amount held by a relative majority of respondents, reveals clear differences across countries: In Croatia and Slovenia, the mode is in the range of EUR 2,000 or more (for those holding euro for reserve purposes), whereas for the other countries it lies in a range of EUR 100 to EUR 249.

This result confirms that the degree of de facto euroization depends on the underlying motives. If people mainly hold foreign currencies for the purpose of spending the money abroad, the amounts will be small, as was the case in the Czech Republic, Hungary and Slovakia. If people tend to use euro cash as

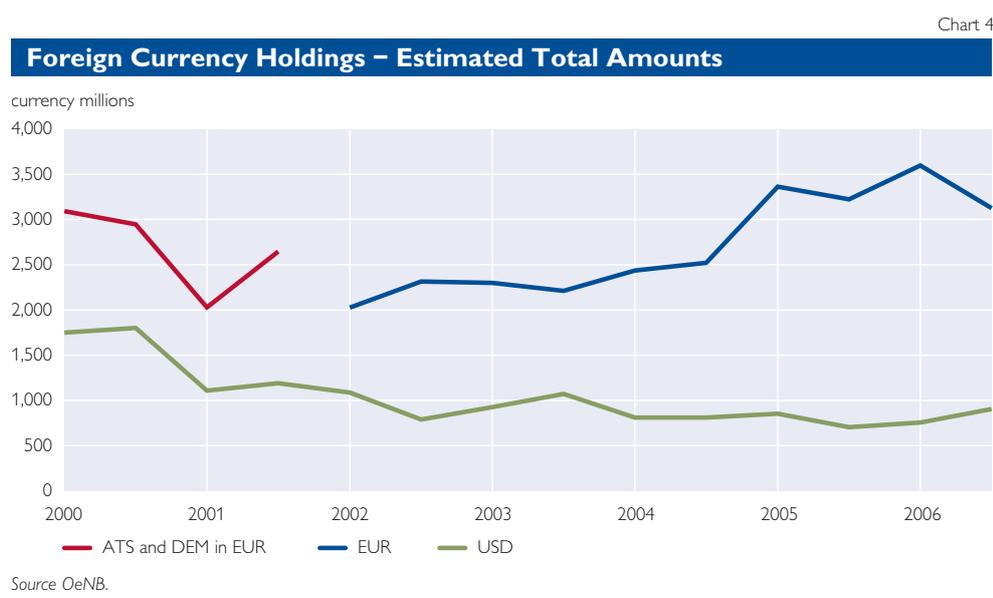
²³ This could possibly be explained by the fact that respondents had to choose one motive. If they hold euro both as a store of value and for shopping abroad, and both motives are of about equal importance, it is likely that the fact that respondents have to decide for only one motive washes out the difference between motives in table 1.

a store of value or for domestic expenditures, the amounts are higher, which was the case in Croatia and Slovenia.

The actual amounts in circulation can be calculated from the survey responses by weighting the class means of the categorized amounts with the percentage share of respondents who answered that the amount of their foreign currency holdings lies in the respective range. Then, by multiplying the resulting average per-capita holdings by the total population figures (for residents above the age of 14), we obtain an estimate of the amount of foreign currency held in the respective country. It should be emphasized that the resulting figures represent only crude estimates that incorporate neither illegal nor other undisclosed cash holdings. Therefore, these estimates are very likely to understate the true amounts by a sizeable factor. Notwithstanding these limitations, we still consider these estimates to be useful, as trend changes over time might be indicative of changes in the overall demand for foreign cash.

Chart 4, which shows the cumulated results for all five countries, indicates that the combined holdings of German mark and Austrian schilling decreased by about one-third between 2000 and early 2002. This is in line with the evidence presented in chart 1. For the period after the cash changeover, our calculations suggest that the demand for euro cash in the five countries increased again slowly until end-2004. Thereafter, the amount increased further, surpassing even the 2000 level. This overall increase is mainly due to a substantial rise in Croatia and, to a lesser extent, in Slovenia.²⁴

For the U.S. dollar, the projections reveal a downward trend for the period from 2000 to 2004, with the 2004 value coming to about one-half of the 2000 value.



²⁴ These estimates imply per capita cash holdings of EUR 380 in Slovenia, EUR 313 in Croatia, about EUR 100 in the Czech Republic and Slovakia and only EUR 14 in Hungary on average in 2006.

Table 2

To what Extent Is Euro Cash Used for Domestic Payments?

	A			B		C		
	Perceived possibility to pay in euro			Who pays in euro?		Did you make payments in euro?		
	Yes			Only tourists make payments in euro		Yes		
	H1 05	H1 06	H2 06	H1 06	H2 06	H1 05	H1 06	H2 06
Croatia	30	34	32	21	26	8	11	9
Czech Republic	53	59	55	54	53	3	4	6
Hungary	40	38	41	30	33	3	2	3
Slovakia	37	43	49	55	54	1	5	6
Slovenia	58	64	63	26	34	7	15	16

Source: OeNB survey.

Note: The values refer only to respondents who gave a valid reply. The exact wording of the questions was “When you think about the past 6 months: Have you noticed that it is possible to pay in euro in your country (e.g. when shopping, in restaurants, when making purchases, etc.)?” (A), “Who is making payments in euro in your country?” (B), and “Have you made any payments in euro during the last six months (in your country)?” (C).

3.2.4 To What Extent Are Euro Used for Domestic Payments?

The survey results reveal that only a small fraction of respondents holds euro for domestic purchases. However, these percentages may be seen as lower bounds, as respondents must choose one single motive. It is possible that people who select store-of-value considerations as their main motive also use euro in domestic transactions. To take account of this fact, the OeNB surveys contain several additional questions on the use of euro cash in the respondents’ home countries.

The first question addresses cash payments in euro in the respondents’ home countries over the past six months (see table 2, column A). Among the respondents who gave a valid answer, 63% of Slovenians, 55% of Czechs and 49% of Slovaks were aware of the possibility to make payments in euro.²⁵ In Hungary and Croatia this percentage is considerably lower at 32% and 41%, respectively. In a temporal dimension, the data show an upward trend in Slovakia and Slovenia.

Respondents who noticed that it was possible to make payments in euro were then asked who made these payments – tourists, inhabitants or both. Here, 54% of Slovaks and 53% of Czechs replied that it was only tourists (table 2, column B). The values were lower for Slovenia and Hungary at 26% and 34%, respectively. In Croatia, three out of four respondents who noticed payments in euro replied that it was not only tourists who made them.²⁶

So far, the questions focused on the respondents’ opinion about other people’s euro payments. As a check, the OeNB survey also addresses the respondents’ personal behavior, asking people directly whether they themselves had made payments in euro in their countries during the last six months. The results are summarized in table 2, column C. Slovenia and Croatia posted the

²⁵ E.g. 58% of Slovenians answered “yes” while 34% did not notice any payment transactions in euro and 8% provided no answer. We focus only on these respondents who gave a valid answer to allow for a cross-country comparison as the share of invalid responses varies across the CEECs.

²⁶ Respondents were also asked whether they thought that payments in euro were made more often than half a year ago. In general, the majority of respondents from all five countries answered “yes.” In Slovenia, 72% of those who noticed euro payments thought the frequency had increased.

highest share of respondents who replied that they had made payments in euro. Over time, there is a clear increase in this share in Slovenia, and, albeit from a low level, in the Czech Republic and Slovakia.²⁷

Overall, the results concerning euro payments can be summarized as follows:

- Between one-third and two-thirds of the population in the five countries under review have noticed that it was possible to make payments in euro in their countries. This share is particularly high in Slovenia and the Czech Republic and relatively high in Slovakia.
- However, the majority of respondents from the Czech Republic and Slovakia thinks that these payments are most likely attributable to tourists only. In Croatia, Hungary and Slovenia, the majority thinks that euro payments are attributable to both inhabitants and tourists.
- Judging from the respondents' replies regarding their own behavior, euro payments by inhabitants seem to be important in Slovenia (where this share more than doubled between 2005 and 2006) and Croatia.

The European Commission's Eurobarometer surveys also collect data on the motives for holding foreign currency, albeit with a rather different focus, concentrating more on where people have used euro cash. Although the specific questions are barely comparable, some aspects of the survey results are in line with the findings from the OeNB surveys.²⁸

One important finding of the EC surveys is that the vast majority of respondents who have already used euro banknotes have used them abroad. When it comes to using euro cash in the respective home countries, the results of the spring 2006 wave show that this share is highest in Slovenia, which is in line with the OeNB survey's findings. Also, both surveys find that the frequency of using euro cash for payments at home is about three times as high in Slovenia as in the Czech Republic and Slovakia. However, according to the Eurobarometer results, the share of those who have used euro cash at home in Hungary is only about one-half as high as in Slovenia; this is not confirmed by the results of the OeNB survey.²⁹

4 Evidence on Economic Reasons for Holding Euro Cash

In this section, we present evidence about the economic aspects of using and owning foreign currencies. A typical approach of macroeconomic (time series) studies would be to regress a measure of euroization on explanatory variables

²⁷ The number of observations is rather small for all countries, which somewhat limits the statistical reliability of the results.

²⁸ The questions in the EC survey are "Have you used euro banknotes (coins)?" and "You said you already used euro banknotes (coins). Was it ...?" Answers are "in your country," "in your country and abroad" and "abroad." In the following, we will focus on banknotes only and disregard the results for euro coins. Another important difference between the surveys is that the questions of the EC survey do not address the time aspect, whereas the OeNB survey specifically asks about the last six months. This implies that the absolute values are not comparable.

²⁹ Concerning Hungary, the evidence is somewhat ambiguous even within the OeNB survey. In particular, judging from the replies to the general question on the respondents' motive to hold euro cash, the role of domestic purchases in euro seems to be more important than the evidence from the direct question about respondents' own behavior suggests. The difference between the latter finding and that of the EC survey might be rationalized if Hungarians do not often make payments in euro (the EC survey does not focus on the last six months) or are more hesitant than others to reveal their behavior in the direct question.

such as an aggregate measure of inflation and exchange rate expectations, a ratchet variable, etc. The use of survey data, in contrast, allows us to present evidence about various variables that affect individual behavior. In particular, we first analyze those factors that are associated with a backward-looking perspective (“experience”). They include people’s confidence in the banking system and the role of remittances and tourism. Then we analyze the factors related to a forward-looking perspective (“anticipation”), focusing on exchange rate and inflation expectations as well as the expected timing of euro introduction.

The use of microdata has some shortcomings. In particular, some aspects can be dealt with only indirectly, and it is not always possible to identify the direction of causality. Furthermore, as our analysis focuses on descriptive results based on univariate analyses, we cannot simultaneously control for more than one potentially important explanatory variable.

4.1 Deposit Safety

As already mentioned, the literature argues that the degree of confidence in the domestic banking system is likely to affect the extent of currency substitution (e.g. Feige et al., 2003). Hence, one would expect currency substitution to be particularly strong in countries that have not yet established a solid and stable banking system or in countries that experienced banking crises recently.³⁰

Until the end of 2005, the OeNB surveys included a question on the perceived safety of bank deposits in the respective countries. In particular the question was “From your point of view – how safe are deposits at banks in your country? (in the sense of loosing the savings due to bankruptcy of banks, fraud, etc.)” Possible answers ranged from “very safe,” “rather safe,” “rather unsafe” to “very unsafe.”³¹ The results in brief: In Croatia, the share of respondents who believe that deposits are very or rather safe increased from less than 50% in April/May 2002 to 60% in October/November 2006.³² In the Czech Republic, this share increased from 43% to 64% and in Hungary from 62% to 76%, while remaining constant in Slovakia at around 69%. In Slovenia, the share was 78% in 2002 and remained rather constant around this high level, declining to 64% only in October/November 2006.³³ Overall, the results suggest that since 2002, the level of confidence in deposit safety has remained high in those countries where it had initially been high and has increased in countries where it had been low.

We try to establish whether there is a correlation between a person’s perception of deposit safety and the likelihood of this person holding foreign cash. A first approximation would be to analyze if there is any difference in the perception of deposit safety between those who do not hold foreign cash and

³⁰ For evidence on the role of deposits and loans, see Backé et al. (2007).

³¹ It should be noted that we are mainly interested in individual behavior and not in the interpretation of aggregate statistics. Given the fact that the figures are barely comparable across countries, we will refrain from interpreting the absolute levels.

³² The percentages are calculated for the aggregate population including those without an opinion. Therefore, the sample also includes respondents who do not have any idea about deposit safety or who do not have a deposit.

³³ In November 2005 there was a spectacular bank robbery in Ljubljana. The decline in perceived deposit safety may be associated with it.

Table 3

Does Perceived Deposit Safety Affect the Level of Cash Substitution?

	Percentage of respondents with only a local currency savings account and foreign cash balances for reserve purposes	Percentage of respondents with a foreign currency account and no foreign cash balances
Croatia	77	78
Czech Republic	72	80
Hungary	87	89
Slovakia	75	82
Slovenia	76	88

Source: OeNB.

Note: The figures denote the percentage of respondents who believe their savings deposits are very safe or safe. The data refer to two subsets of respondents: The first group (left column) has savings accounts in local currency only and keeps foreign cash at home, while the other group (right column) has savings accounts in foreign currency but does not keep foreign cash at home. For instance, in Croatia, 77% of the first group believe that their savings are very or rather safe. Aggregated data are from the first wave in 2004 to the last wave in 2005.

those who do. However, such a comparison may yield distorted results, given that sample selectivity is likely to be an issue. For instance, people who hold foreign cash have higher incomes, a higher likelihood of being employed, etc. Typically, such variables also affect the respondents' views on sentiment variables, e.g. deposit safety.

Thus, we aim at defining two groups with rather similar sociodemographic characteristics that differ only in terms of their foreign cash holdings. In light of these considerations, we selected the following two groups: respondents who have a savings account in local currency only and keep foreign cash as a store of value and respondents who have a foreign currency account, but no foreign cash. This means that the members of the first group have euro at the bank, while the others keep euro cash at home. The results are summarized in table 3.

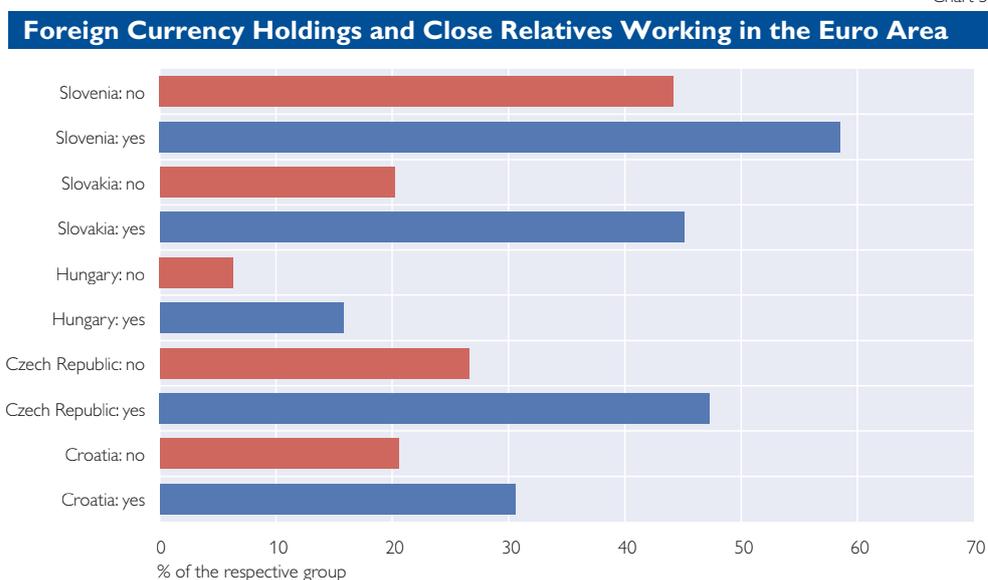
Our expectation is that those who hold euro cash are more pessimistic about deposit safety than the others. The results from Croatia and Hungary clearly do not confirm our assumption, while the expected result is obtained for the Czech Republic and Slovakia (the difference might be different from zero also statistically). For Slovenia, the difference is quite large. Hence, the results of our univariate analysis suggest that at least in some countries, perceived deposit safety seems to be correlated with the decision to hold foreign cash instead of putting it in a bank account.

4.2 Remittances and Tourism

The role of remittances from a macroeconomic perspective has already been highlighted. In addition, we want to analyze their role from a microeconomic perspective. To this end, the OeNB survey contains the following question: "Do you have any close relatives who are working in the euro area?" This information allows us to analyze whether the share of respondents holding euro is higher for those who have such a close relative than for those who don't.³⁴

³⁴ However, this variable can only serve as a proxy measure, as the mere fact that people have a close relative who works in the euro area does not necessarily imply that they receive remittances.

Chart 5



Source: OeNB.

Note: The bars represent the percentages of respondents who hold euro cash for two groups: those who have (yes) and those who don't have (no) close relatives working in the euro area. In Croatia, for instance, 31% of respondents who have close relatives working in the euro area hold euro cash, compared with only 21% of those who don't have any close relatives working in the euro area. Data are from the first half of 2004 to the first half of 2006 based on 5,000 observations for each country.

Chart 5 shows the share of respondents who hold euro broken down into the two groups – those with and those without close relatives working in the euro area. As is visible, there is a clear difference between the two groups that ranges from about 10 percentage points (pp) for Hungary and Croatia to 14pp in Slovenia and 20pp to 25pp in the Czech Republic and Slovakia.³⁵ Thus, the results suggest that euro holdings are more widespread among people who have close relatives working in the euro area.

The role of tourism (or the number of visits to the euro area) is another issue that may have an impact on the degree of cash substitution. The OeNB survey results show that since 2002, the share of respondents who traveled to the euro area in the year prior to the respective survey has increased from 23% to 29% in Croatia, from 7% to 17% in Hungary and from 44% to 59% in Slovenia. Only in the Czech Republic and Slovakia did this share remain constant, albeit at high levels of 43% and 35%, respectively. Does this increase in the number of visits to the euro area induce an increase in the amount of euro cash in circulation in these countries?

³⁵ It could be argued that these differences have nothing to do with remittances, as people may hold euro to visit their relatives. To account for this argument, we repeated the analysis, excluding those respondents who hold euro for the purpose of making purchases abroad. The previous result was confirmed: We again find differences between these two groups ranging from 4pp (which is most likely not different from zero statistically) to 9pp.

Table 4

Euro Cash Holdings and Frequency of Visits to the Euro Area

Number of trips to the euro area over the last 12 months	Croatia	Czech Republic	Hungary	Slovakia	Slovenia
No trip	18	8	3	10	31
1 to 5 trips	42	55	28	53	57
More than 5 trips	58	83	33	71	69

Source: OeNB.

Note: The figures denote the share of respondents who hold euro cash. The values represent averages over the surveys from 2004 to 2006 and are based on 5,000 observations per country.

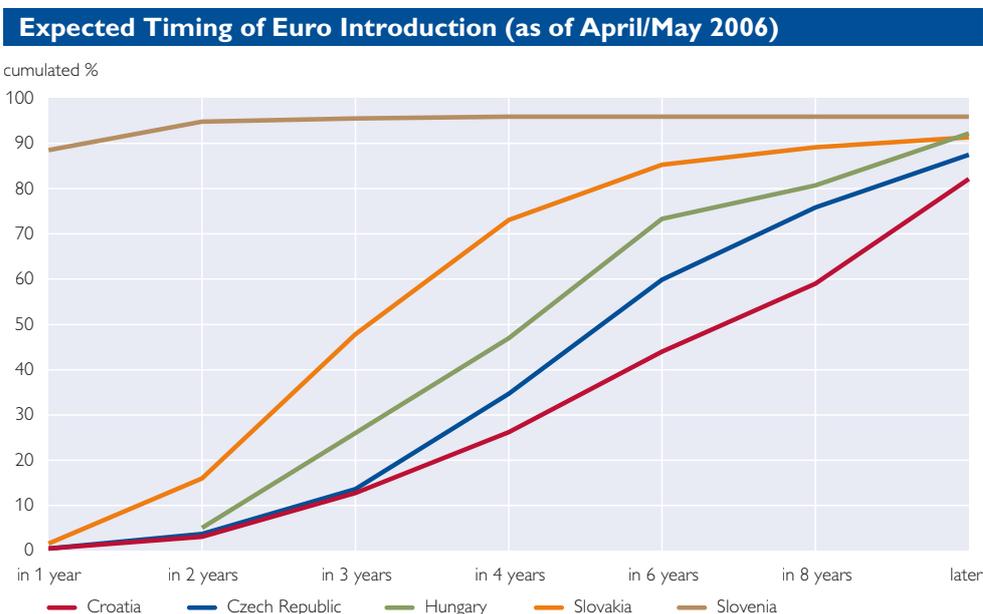
Table 4 shows a cross tabulation of euro ownership and the number of visits to the euro area. Among those who did not visit the euro area in the year prior to the respective study, the share of respondents who held euro cash was 31% in Slovenia, 18% in Croatia, 10% in Slovakia, 8% in the Czech Republic and 3% in Hungary. It is noticeable that the ratios are sizeable only in Croatia and Slovenia, where the store-of-value motive plays a substantial role. In the other countries, where the majority of euro holders uses these balances for trips to the euro area, the shares are much lower. However, ownership rates increase sharply with the number of visits to the euro area. For example, 69% of those Slovenians who took more than five trips to the euro area held euro cash, which is more than double the share of Slovenians who did not travel to the euro area at all. In other countries, the ratio is 3 to 11 times higher relative to those who did not take a trip to the euro area. In sum, the results clearly illustrate that increased tourism flows have an impact on euro cash holdings in the five CEECs.

4.3 Expected Timing of Euro Introduction

Another interesting question is whether the prospective introduction of the euro affects the behavior of individuals, inducing them to hold more euro cash.

Both the OeNB surveys and the EC surveys contain information on the expected date of euro adoption and arrive at rather similar results: First, the overwhelming majority of respondents from the CEECs expects that the euro will be introduced at some point in time. According to the OeNB survey, for example, the share of respondents from the Czech Republic, Hungary, Slovakia and Slovenia who believed that the euro will never be introduced lies between only 1% and 3% on average. Even in Croatia, which is not an EU member country yet, this share was just 9%. Second, more cross-country variation can be found concerning the expected timing of euro adoption. Chart 6 depicts the responses (cumulated for each country) regarding the expected date of euro introduction. The figures are from the OeNB's May 2006 survey.³⁶ Not surprisingly, the earliest date of adoption was expected in Slovenia, followed by Slovakia, where 50% of respondents thought that the euro would be

³⁶ We chose survey data of May 2006 to facilitate a comparison with the EC survey and also because Slovenia adopted the euro in 2007 – in fall 2006, almost all Slovenians expected the euro to be introduced in January 2007.



Source OeNB.

Note: The chart shows cumulative responses to the following question: "When do you personally think that your country will introduce the euro?" For Hungary, the categories "within the next 12 months" and "in one to two years" are merged. The missing values to 100% represent those who replied "never" or "don't know."

introduced within the next three years and 73% within the next four years. In Hungary, 47% expected the euro to be introduced within the next four years, while it was around one-third in the Czech Republic and roughly one-fourth in Croatia.³⁷

The EC surveys additionally ask about the most desired time frame for adoption of the euro. Respondents could choose among the following answers: "as soon as possible," "after a certain time" and "as late as possible." In all new EU Member States, there is a preference for earlier adoption, as the share of respondents favoring "as late as possible" decreased relative to earlier surveys.³⁸ This could reflect an increase in familiarity with, and acceptance of, the euro among respondents.

On the basis of the answers concerning the expected date of euro adoption, we can analyze whether there is a systematic difference in terms of the respondents' euro cash holdings between those who expect the euro to be introduced earlier and those who think it will take longer or never happen at all. The results are summarized in table 5, which shows the share of respondents from Croatia and Slovenia who hold euro cash as a store of value broken down into groups according to their expectations regarding the timing of euro

³⁷ The EC survey arrives at the same ranking for these three countries: Euro adoption is expected first in Slovakia, then in Hungary and last in the Czech Republic. However, it seems that the respondents of the EC survey are more optimistic in all countries, expecting earlier introduction dates than the respondents of the OeNB survey. For example, the EC survey shows that 70% of respondents from the Czech Republic expect the euro to be introduced by 2010, whereas it is only 35% in the OeNB survey. This difference may be attributable to a different wording of the questions. While the answers in the OeNB survey refer to the number of years relative to the date of the survey (in 1 to 2 years, in 2 to 3 years, etc), those in the EC survey refer to absolute years.

³⁸ With the exception of Cyprus.

Table 5

Euro Cash as a Store of Value and Expected Timing of Euro Introduction

	Croatia	Slovenia
Within the next 2 years	29.1	28.3
In 2 to 4 years	27.4	24.3
In more than 4 years	24.2	22.8
Never	19.0	–
Don't know	15.3	17.1
Average	23.1	27.2

Source: OeNB survey.

Note: The table shows the percentage of respondents who hold euro cash as a store of value (basis: whole population). For example, in Croatia, 29.1% of those who expect the euro to be introduced within the next two years hold euro cash as a general reserve (implying that 70.9% of this group do not hold euro cash as a reserve). Aggregated data are from 2005 and the first wave in 2006. – means that the number of observations is too low.

adoption. We concentrated on these two countries, as they alone have a sufficient number of respondents who hold euro as a store of value.

The results reveal that the share of respondents who believe the euro will be introduced earlier is larger than the share of those who think it will be later.³⁹ Also, for Croatia, we find that euro holdings are lowest among those who expect that the euro will never be introduced or who do not have an opinion. However, the effect does not seem to be very strong. The direction of causality is also a subtle issue. Yet, if we interpret causality to go in this direction, the figures in table 5 provide additional indirect evidence of a link between the anticipated date of euro adoption and euro cash holdings.

4.4 Exchange Rate and Inflation Expectations

The OeNB survey contains questions on inflation⁴⁰ and exchange rate expectations⁴¹. The answers to these questions can be used to evaluate whether inflation or exchange rate expectations are correlated with currency substitution. After all, high inflation rates and exchange rate depreciations reduce the rate of return on assets in local currency relative to euro. Consequently, when people think inflation and/or depreciation of the local currency will be high, we may expect them to shift the currency composition of their assets toward a stronger currency. On the basis of the survey data, we can analyze whether the share of respondents who expect inflation to increase (or the currency to depreciate) is higher among the group which holds foreign cash than among those who don't.

However, any evidence obtained in this way can only be indicative at most. This caution is justified mainly for three reasons, the first of which is related to sample selectivity: It does not make much sense to compare the results for those who hold foreign currencies with those who don't, because people who do not hold foreign currencies are in general seemingly more pessimistic about

³⁹ This result could partly be due to sample selectivity, as richer people (who have larger euro holdings) are generally found to have a stronger pro-EU attitude.

⁴⁰ "Compared with the last 12 months, how do you think will prices develop in your country over the coming 12 months?" Possible replies: Prices will "rise more sharply than in the past," "rise at roughly the same pace as before" or "drop compared with the past 12 months."

⁴¹ "How do you think will the exchange rate of your country's currency develop over the next 2 years?" Possible replies: The currency will "lose value against the euro," "stay the same" or "gain value against the euro."

inflation and exchange rate developments. Therefore, we have to define two groups which differ only in terms of their foreign currency holdings. Second, the direction of causality is again an issue, and third, an appropriate assessment of how inflation and exchange rate expectations affect agents' behavior would require comparing returns on investment in local and foreign currencies. We do not have this information, however.

With these potential pitfalls in mind, we chose to restrict the sample to those respondents who only hold saving deposits in local currency. Of this group, we compare the following two subsets: those who keep foreign cash at home as a store of value and those who don't.⁴² Table 6 shows the results for inflation expectations and table 7 for exchange rate expectations. The figures in table 6 represent the share of respondents who expect the inflation rate to increase. One would expect this share to be higher among those who hold foreign cash (right column) than among those who hold only assets denominated in local currency (left column). This is, however, only the case in the Czech Republic and Hungary, and even in these two countries the difference is not sizeable. In all other countries, the difference is either negligible or has the opposite sign. This result suggests that, on average, no correlation seems to exist between expected inflation and the decision to hold foreign currencies.

A rather similar picture emerges for the impact of exchange rate expectations. The figures in table 7 represent the share of respondents who believe that the exchange rate will depreciate against the euro. One would again expect a higher share among those who hold foreign cash (right column) than among those who hold only assets denominated in local currency (left column). This holds true only for the Czech Republic and Hungary, but the difference is again negligible. In all other cases, the sign of the difference is opposite to our expectations: The share of respondents who believe the exchange rate will depreciate is higher among those who only have assets in local currency than among those who also have foreign currency assets.

Table 6

Inflation Expectations and Currency Substitution

	Percentage of respondents who don't hold foreign cash as a store of value	Percentage of respondents who hold foreign cash as a store of value
Croatia	43	31
Czech Republic	26	31
Hungary	30	32
Slovakia	31	30
Slovenia	45	43

Source: OeNB survey.

Note: The figures refer to the percentage of respondents who expect inflation rates to increase. The data refer to a subset of respondents who only have savings accounts in local currency, broken down into two groups – those who don't keep foreign cash at home and those who do. In Croatia, for instance, 43% of the group that does not keep foreign cash expect inflation rates will rise, while 57% expect inflation to remain stable or decrease. Aggregated data are from the second wave in 2004 to the last wave in 2005.

⁴² We repeated the tests with several other subsets, but the results remained the same qualitatively.

Table 7

Exchange Rate Expectations and Currency Substitution

	Percentage of respondents who don't hold foreign cash as a store of value	Percentage of respondents who hold foreign cash as a store of value
Croatia	47	48
Czech Republic	21	32
Hungary	61	55
Slovakia	25	17
Slovenia	58	54

Source: OeNB survey.

Note: The figures refer to the percentage of respondents who expect the exchange rate to depreciate. The data refer to a subset of respondents who only have savings accounts in local currency, broken down into two groups – those who don't keep foreign cash at home (left column) and those who do (right column). In Croatia, for instance, 47% of the group without foreign cash balances expect the local currency to depreciate relative to the euro, while the remaining 53% of this group expect the exchange rate to remain stable or appreciate. Aggregated data are from the second wave in 2004 to the last wave in 2005.

These results are somewhat surprising but may be explained by the caveats mentioned above. A more sophisticated regression-based analysis would possibly help to shed more light on this issue. Still, our findings indicate that in times of moderate inflation and exchange rate movements, the two variables do not influence the degree of currency substitution significantly. Therefore, the continued use of foreign currencies is more likely attributable to past developments (e.g. surging inflation, banking crises) than to expected inflation and exchange rate developments.

5 Conclusions

Although euroization is an important phenomenon in CEECs, still very little is known about who holds how much euro and for what purposes. To some extent, this is explainable by the fact that economic analyses mostly have to rely on macroeconomic data which, given the high level of aggregation, conceal important aspects. In this paper, we choose a different approach. In particular, we employ unique survey data on various aspects of foreign currency holdings in five CEECs. This allows us to study the various motives behind (cash) euroization as well as the connection between expectations about certain key economic variables and the degree of euroization. The analysis relies predominantly on surveys commissioned by the OeNB that were conducted in Croatia, the Czech Republic, Hungary, Slovakia and Slovenia.

Our results show that a substantial share of the population in the respective countries holds euro cash. In the second half of 2006, this applied to about every second (adult) Slovenian, every fourth to every third Croat, Czech and Slovak, and, markedly lower, to every fourteenth Hungarian. A closer look reveals that significant amounts of euro cash are held in only two countries, namely Slovenia and Croatia. Both are former Yugoslav republics in which currency substitution (mostly by German mark) had been a widespread phenomenon in the wake of economic turbulence and political turmoil. In the other three countries covered by the OeNB survey – Hungary, the Czech Republic and Slovakia – foreign cash holdings are relatively small in value, as they are mainly motivated by regular shopping tours to or vacations in the euro area.

Will the degree of euroization increase as the date of euro adoption approaches and economic ties become closer (e.g. increased trade and tourism)? Or will it decrease in line with the countries' continued economic stabilization? We find some evidence that the degree of cash euroization is in fact associated with distrust in the banking system: People who perceive deposits as unsafe are more likely to hold euro than people who don't. In contrast, we found no clear influence of inflation and exchange rate expectations on euro cash holdings. This could possibly reflect the fact that, compared with the 1990s, both exchange rate and inflation movements have been rather moderate over the last few years. The impact of moderate developments on people's behavior is much weaker than that of large changes. Therefore, it seems that past events ("experience") play a bigger role in explaining why people continue to hold substantial balances in foreign cash than inflation or exchange rate expectations.

In addition, we find that the rise in tourism has increased the transaction demand for euro cash (although most of these balances are low in value). More importantly, our evidence also suggests that the expected timing of euro introduction affects cash holdings: Those who expect the euro will be adopted earlier are more likely to hold euro cash as a store of value than those who think it will be introduced at a later point in time or never at all.

Given this evidence, we can now turn to the question posed in the title of this paper: Are euro cash holdings driven by experience or anticipation? All in all, our results support the notion that euroization is driven both by experience and anticipation. Furthermore, the development observed over the last years – increases in the demand for euro since its introduction in 2002 – suggests that the increase in demand due to anticipation is stronger than the decrease in demand due to economic stabilization.

Finally, our results also allow for an assessment of how euro circulation has evolved in the run-up to the euro. In Slovenia, which introduced the euro in 2007, the share of the population holding euro cash went up from 42% in spring 2002 to about 50% at end-2004. After that, it remained broadly stable before dropping to 41% in October/November 2006. We observed that also the amounts of euro cash held by Slovenians declined in the second half of 2006. At the same time, the share of those respondents who made domestic payments in euro increased substantially. Thus, the case of Slovenia suggests that both euro amounts in circulation and the euro's use in domestic payments increase in the years before the introduction. Euro cash balances were reduced again only shortly before the actual introduction.

As the empirical analysis in this paper is based on descriptive statistics, it would be interesting to test whether a multivariate analysis confirms our conclusions and findings. As this issue affects both the effectiveness of monetary policy and cash logistics, we consider this a worthwhile undertaking.

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Appendix

Table A1. Description of surveys

EC surveys	Country coverage: 10 new Member States. Sample size: approximately 1,000 per country. Each national sample is representative of the population aged 15+.		
	Flash Eurobarometer 183 http://ec.europa.eu/public_opinion/flash/fl183_en.pdf	March/April 2006	“Telephone interviews were conducted in each country with the exception of the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland and Slovakia where both telephone and face-to-face interviews were conducted.”
	Flash Eurobarometer 175b http://ec.europa.eu/public_opinion/flash/fl_175b_en.pdf	September 2005	“Telephone interviews were conducted in each country with the exception of the Czech Republic, Latvia, Lithuania, Poland and Slovakia where face-to-face interviews were conducted due to low telephone penetration rates. In Estonia, both telephone and face-to-face interviews were conducted.”
	Flash Eurobarometer 165b http://ec.europa.eu/public_opinion/flash/flash165b_en.pdf	September 2004	face-to-face interviews
OeNB surveys	Country coverage: Croatia, Czech Republic, Hungary, Slovakia, Slovenia. Sample size: approximately 1,000 per country. Each national sample is representative of the population aged 15+.		
	Biannual waves starting from 2004	April/May October/November	face-to-face interviews

Central Bank Independence in Southeastern Europe with a View to EU Integration – Revisited

Sandra Dvorsky¹

This contribution updates an analysis of central bank legislation in eight Southeastern European (SEE) countries published in 2004. It uses the ECB classification and examines functional, institutional, personal and financial independence. The relevant Treaty² requirements serve as a benchmark for assessing the degree of legal central bank independence (CBI) already achieved in the respective areas. The author finds that since 2004 some SEE countries have achieved further progress in aligning central bank legislation with Treaty requirements. As in 2004, the degree of CBI continues to correspond largely to the respective country's level of integration with the EU. The main remaining weakness can be found in the area of personal independence, in particular in the provisions on the dismissal of central bank top officials. Further crucial areas are the prohibition of monetary financing and provisions on loss coverage. The paper concludes that legal arrangements to protect the status of the central bank are a necessary, though not sufficient, prerequisite for CBI. In fact, the importance of practical implementation cannot be overestimated.

1 Introduction

The degree of central bank independence (CBI) has substantially increased in Central, Eastern and Southeastern Europe over the past decade. Undoubtedly, a main driving force for this development was (and still is) the ambition of these countries to join the European Union.

The main purpose of this paper is to provide an updated³ overview and analysis of central bank legislation in eight Southeastern European (SEE) countries. The countries examined comprise the new EU Member States Bulgaria and Romania, the EU candidate countries Croatia and the former Yugoslav Republic of Macedonia⁴ as well as the potential EU candidate countries Albania, Bosnia and Herzegovina, Montenegro, and Serbia. The requirements laid down in the Treaty are used as the benchmark for assessing the degree of legal CBI already achieved.⁵ This contribution focuses primarily on developments that have taken place since 2004. These are, among others, amendments to central bank laws in Bosnia and Herzegovina (February 2005), in Bulgaria (April 2005), in Croatia⁶ and in the Republic of Macedonia (both in

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² Treaty establishing the European Communities (1957), as amended by the Treaty of Maastricht (1992) and the Treaty of Amsterdam (1997), referred to as the Treaty hereinafter.

³ In particular, the paper provides an update of the study *Central Bank Independence in Southeastern Europe with a View to Future EU Accession*, which dealt with seven SEE countries at the time (see Dvorsky, 2004). Given Montenegro's independence as of June 2006, the country is now included in the analysis.

⁴ The former Yugoslav Republic of Macedonia (FYROM) will be referred to as the Republic of Macedonia hereinafter.

⁵ In this context, the following caveat has to be made: While harmonizing national central bank legislation with Treaty requirements in most cases leads to an increased level of CBI, this does not necessarily hold in all cases. However, taking into account that all countries analyzed strive to harmonize their central bank legislation with Treaty requirements, the choice of this benchmark seems appropriate.

⁶ In order to fully align central bank legislation with the *acquis communautaire*, Croatia and the Republic of Macedonia intend to adopt another amendment to the Law on the Croatian National Bank in 2007.

December 2006). Furthermore, the paper will touch upon some new developments in the area of “institutionalized assessment” of CBI.⁷

2 Required Scope and Timing of Legal Adjustments

According to Article 109⁸ of the Treaty, “each Member State shall ensure, at the latest at the date of the establishment of the ESCB,⁹ that its national legislation including the statutes of its national central bank (NCB) is compatible with this Treaty and the Statute¹⁰ of the ESCB.” This implies that countries joining the EU after the establishment of the ESCB in June 1998 have to adjust their national legislation in the area of CBI by the date of EU accession (European Central Bank – ECB, 2006b, p. 31, and European Commission 2004d, p. 9). Inter alia, Article 109 refers to the definition of the central bank’s objectives (Article 105 (1) of the Treaty) and to the issue of NCB independence, comprising the freedom from instruction (Article 108 of the Treaty), provisions protecting the legal status of the central bank’s top officials (Article 14 (2) of the Statute) and the financial independence of the central bank (European Monetary Institute – EMI, 1996, pp. 102–103). Article 109 also refers to the prohibition of monetary financing and of privileged access to financial institutions (Articles 101 and 102 of the Treaty, respectively; European Commission, 2004d, pp. 9–12) which the Member States had to implement even before the date of establishment of the ESCB, namely at the beginning of Stage Two of Economic and Monetary Union in January 1994 (Article 116 of the Treaty). These three areas of legislation (definition of the central bank’s objectives, NCB independence and prohibition of monetary financing and of privileged access to financial institutions) are clearly defined as *acquis communautaire* and consequently have to become effective at the latest upon EU accession (“preaccession requirements”).

In addition, Article 109 requires adaptations which relate to the full legal integration of an NCB into the Eurosystem, for instance regulating the adjustment of monetary policy instruments.¹¹ These adaptations (referred to as “integration requirements” in the following) need only enter into force at the date on which the Member State adopts the single currency.¹² On the required timing of enactment of the integration requirements, the European Commission had argued in the past that “new member states are expected to adjust their national legislation as soon as possible after their accession to the EU” and

⁷ This covers regular monitoring activities carried out by the European Commission and the ECB, such as the Opinions on a particular country, the Progress Reports or the Convergence Reports (see Dvorsky, 2005, pp. 72–73).

⁸ In the following, references to particular Articles of the Treaty are made in accordance with the new numbering introduced by the Treaty of Amsterdam in 1997.

⁹ European System of Central Banks (ESCB).

¹⁰ Protocol on the Statute of the European System of Central Banks and of the European Central Bank (1992), referred to as the Statute hereinafter.

¹¹ Article 43.1 of the Statute – in analogy to Article 122 (3) of the Treaty – lists Articles which do not apply to Member States with a derogation. These Articles comprise the adjustment of monetary policy instruments, the mandatory transfer of foreign reserve assets to the ECB, the ECB’s exclusive right to issue banknotes etc. (European Commission, 2004d, pp. 12–13).

¹² It is interesting to note that the Convergence Reports of the European Commission and the ECB not only review the integration requirements, but also the preaccession requirements. The European Commission argues that the convergence assessment covers these areas of legislation, because national legislation could have been amended in the meantime (European Commission, 2004d, p. 9).

“... to ensure compliance in time for the next Convergence Report” (European Commission, 2004d, p. 14). It is noteworthy that the European Commission’s 2006 Progress Reports on the three candidate countries for the first time include the examination of the legal integration requirements, which implicitly qualifies them as preaccession requirements (see European Commission, 2006b, p. 42, 2006c, p. 38, and 2006d, p. 51, respectively).¹³

For comparing and analyzing current central bank legislation in the SEE countries, the ECB’s four-tier classification will be applied, which also provides the analytical framework for examining CBI in the ECB Convergence Reports. Thus, the author will distinguish between the following four aspects of CBI: functional, institutional, personal and financial independence (for detailed definitions, see Dvorsky, 2004, p. 54).

2.1 Statutory Objectives – Functional Independence

The ECB’s concept of functional independence is based on Article 105 (1) of the Treaty and Article 2 of the Statute, according to which the “primary objective of the ESCB shall be to maintain price stability.” As regards the required timing¹⁴ for enactment of these provisions, the ECB takes the view in its Convergence Reports that the obligation of NCBs to have price stability as their primary objective is a preaccession requirement (see ECB, 2006b, p. 31).

Furthermore, Article 105 (1) of the Treaty and Article 2 of the Statute provide for a secondary objective: “Without prejudice to the objective of price stability, it shall support the general economic policies in the Community.” Provisions on the secondary objective are clearly defined as integration requirements. This means, inter alia, that statutory objectives with a “national flavor”¹⁵ have to be adapted upon EU accession, but need to enter into force only upon euro adoption (see ECB, 2006b, p. 32).

Looking at the legislated objectives of central banks in SEE, the situation as described in the 2004 study has remained broadly unchanged: Most central bank laws contain a clearly defined policy objective for the central bank, with six out of eight laws explicitly referring to “price stability” as the primary objective (see table 1). Bosnia and Herzegovina’s law will have to be adapted in this area, as it still makes reference to the “stability of the domestic currency” (see Dvorsky, 2004, p. 55). Montenegro’s central bank law is silent on statutory objectives because it stipulates the euro as the country’s legal tender. Six of the eight SEE central bank laws under consideration also provide for a secondary policy objective. Bulgaria’s amended central bank law contains a stipulation on the secondary objective, which entered into force upon Bulgaria’s EU accession. It refers to the support of general economic policies in the EU, so that the law

¹³ The ECB had traditionally taken a somewhat stricter approach, maintaining that the integration requirements have to be enacted by the date of establishment of the ESCB in Sweden and by May 1, 2004, in the Member States which joined the EU on that date, thus qualifying them as preaccession requirements (see ECB, 2004, p. 30, and ECB, 2006b, p. 43).

¹⁴ The ECB Convergence Report 2004 mentions that the Treaty is unclear as regards the timing of the compliance with the objective of price stability and identifies an inconsistency in the Treaty: While Article 105 (1) of the Treaty does not apply to Member States with a derogation according to Article 122 (3) of the Treaty, Article 2 of the Statute does apply to such Member States.

¹⁵ For example, where national statutory provisions require the NCB to conduct monetary policy within the framework of the country’s general economic policy.

Table 1

Statutory Objectives, Formulation and Implementation of Monetary Policy		
Central Bank	Statutory Objectives – Functional Independence	Formulation and Implementation of Monetary Policy – Institutional Independence
Bank of Albania	<ul style="list-style-type: none"> * "... to achieve and maintain price stability." (Article 3.1) * other objectives, subordinated to price stability (Articles 3.2 and 3.3) 	<ul style="list-style-type: none"> * "... formulate, adopt and execute the monetary policy ..." (Article 3.4a) * "... formulate, adopt and execute ... the exchange rate policy" (Article 3.4b) * freedom from instruction (Article 1.3)
Central Bank of Bosnia and Herzegovina	<ul style="list-style-type: none"> * "... to achieve and maintain stability of the domestic currency ..." by applying a currency board arrangement (Article 2.1) 	<ul style="list-style-type: none"> * "... to formulate, adopt and control monetary policy by issuing domestic currency at the exchange rate determined in Article 32 ..." (Article 2.3a) * freedom from instruction (Article 3)
Bulgarian National Bank	<ul style="list-style-type: none"> * "... to maintain price stability ..." (Article 2.1) * without prejudice to the primary objective, the Bank shall support general economic policies in the EU, upon Bulgaria's EU accession (Article 2.2) * without prejudice to Articles 2.1 and 2.2, the BNB "shall support the policy of sustainable and noninflationary growth" (Article 2.3) 	<ul style="list-style-type: none"> * detailed definition of currency board regime (Article 28) * fixed exchange rate (Article 29) * freedom from instruction (Articles 44, 1.2, 50 and 51)
Croatian National Bank	<ul style="list-style-type: none"> * "... to achieve and to maintain price stability" (Article 3.1) * "... without prejudice to its primary objective, the Bank shall support economic policies ..." (Article 3.2) 	<ul style="list-style-type: none"> * "establish and implement the monetary and foreign exchange policies" (Article 8.1) * freedom from instruction (Article 2.10, amended in December 2006)
National Bank of the Republic of Macedonia	<ul style="list-style-type: none"> * "... to maintain price stability" (Article 3) * the Bank shall support economic policy and financial stability without jeopardizing its main objective (Article 3) 	<ul style="list-style-type: none"> * the bank shall "establish and conduct the monetary policy" (Article 10) * the bank shall "establish and conduct the exchange rate policy" (Article 20) * in case of lack of consent by the National Bank Council, the final decision is taken by parliament (Article 67) * the decision on monetary policy objectives has to be submitted to parliament (Article 54) * freedom from instruction (Article 4)
Central Bank of Montenegro	no provision	<ul style="list-style-type: none"> * the bank is responsible for monetary policy, a sound banking system and an efficient payment system; monetary policy is based on the euro as a monetary unit, payment instrument as well as a reserve currency (Article 1) * the central bank may not issue money (Article 3)
National Bank of Romania	<ul style="list-style-type: none"> * "... to ensure and maintain price stability" (Article 2.1) * "Without prejudice to its primary objective, the NBR shall support general economic policy" (Article 2.3) 	<ul style="list-style-type: none"> * "... to define and implement the monetary policy and exchange rate policy" (Article 2.2a) * "define and implement exchange rate policy" (Article 9.1) * freedom from instruction (Article 3.1)
National Bank of Serbia	<ul style="list-style-type: none"> * "... achieving and maintaining price stability" (Article 3) * "... in addition, ... striving for financial stability" (Article 3) * "Without prejudice to its primary objective, the Bank shall support economic policy" (Article 3) 	<ul style="list-style-type: none"> * "... determine and implement monetary policy" (Article 4.1) * "... determine exchange rate regime with the consent of the government" (Article 4.2) * ex ante submission of the monetary policy program to parliament for information (Article 71) * freedom from instruction (Article 2)

Sources:

- Law 8269 on the Bank of Albania. 1997. December 23.
 Law 312 on the Statute of the National Bank of Romania. 2004. June 28.
 Law on the Bulgarian National Bank. 1997. June 10.
 Law on the Central Bank of Bosnia and Herzegovina. 1997. June 28.
 Law on the Central Bank of Montenegro. 2000. November.
 Law on the Central Bank of the Republic of Turkey. No. 1211. 1970. January 14.
 Law on the Croatian National Bank. 2001. April 5.
 Law on the National Bank of the Republic of Macedonia. 2002.
 Law on the National Bank of Serbia. 2003. July 19.
 Data compiled by the author.

Note: The central banks are referred to by their English designation.

is now in full compliance with integration requirements as well. The wording of the Serbian central bank law still carries a potential of conflicting goals for monetary policy, stipulating that the central bank shall strive for financial stability without giving clear precedence to the objective of price stability (also see Dvorsky, 2004, p. 55). To sum it up, regarding primary statutory objectives, the laws in most SEE countries are largely in line with the Treaty, whereas for secondary objectives, in most SEE countries will still need adaptations.¹⁶

2.2 Formulation and Implementation of Monetary Policy – Institutional Independence

The ECB's definition of institutional independence is based on Article 108 of the Treaty and Article 7 of the Statute (ECB, 2006b, p. 31). These provisions prohibit the ECB, the NCBs and the members of their decision-making bodies to take or seek instructions from Community institutions or bodies, from any government of a Member State or from any other body. This paper takes a broader approach and examines – in addition to the issue of freedom from instruction – whether the central bank laws under consideration endow their central banks with the necessary competences to formulate and implement monetary policy in order to achieve the primary objective independently.

As to institutional independence according to the ECB's definition, the freedom from instruction is explicitly stipulated by six of the eight SEE central bank laws (see table 1). Compared with the situation in 2004, the only change in this area was a rewording of the Croatian central bank law in order to fully comply with Treaty requirements (see Article 2.10 of the amended Croatian law). In some other SEE countries, the main weaknesses identified in 2004 have remained unchanged. In particular, the legislation of the Republic of Macedonia and of Serbia oblige the central banks to submit their monetary policy program *ex ante* to the parliament, which potentially implies political influence on monetary policy decisions taken by the central bank. Furthermore, the parliament of the Republic of Macedonia has a final say if the National Bank Council cannot achieve the necessary majority for decision-making. However, the prohibition of external influence on the central bank as understood by the ECB covers all possible sources of influence, both at the national level (government, parliament) and at the EU level (Community institutions or bodies) as well as different forms of influence (the right to give instructions, to approve, suspend, annul, defer or censor decisions).¹⁷ According to this very strict interpretation of institutional independence, the wording of several SEE laws will have to be further adapted.

Pursuant to Article 105 (2) of the Treaty and Article 3.1 of the Statute, one of the ESCB's basic tasks is to define and implement the monetary policy of the Community. Most SEE central bank laws contain provisions that vest the

¹⁶ In this context, it is worth mentioning that also some EU Member States were criticized in the latest Convergence Reports of the ECB and the European Commission as regards secondary objectives (see ECB, 2006b, p. 223 on Hungary and p. 229 on Poland as well as European Commission, 2006a, p. 64 on Hungary, p. 91 on Poland, p. 104 on Slovakia and p. 118 on Sweden).

¹⁷ As a case in point, the European Commission's Convergence Report 2004 identified a number of weaknesses and imperfections in the respective sections on institutional independence in some Member States' central bank laws (see e.g. European Commission, 2004d, p. 118 on Sweden). In a similar vein, the ECB's Convergence Report 2006 examined institutional independence in a rather strict sense (ECB, 2006b, p. 227 or p. 232).

respective NCBs with the formal responsibility to design and implement monetary policy in their countries (see table 1). Bulgaria as well as Bosnia and Herzegovina operate currency board arrangements which leave no room for the central banks to independently design monetary policy (apart from changes in mandatory reserve requirements). In Montenegro, which does not pursue national monetary policies, the central bank's functions are even more limited.

To sum it up, Bulgaria and Croatia have achieved some progress in the area of institutional independence, while in particular the legislation of the Republic of Macedonia and of Serbia still need to be adjusted substantially.

2.3 Personal Independence

The definition of personal independence is largely undisputed and relates to arrangements on the role, status and composition of the central banks' highest decision-making bodies. This includes appointment procedures, the length of the term of office and the possibility of renewing a mandate, rules for dismissal, requirements regarding professional competence and incompatibility clauses.

While the Treaty and the Statute contain appointment procedures for the members of the Executive Board of the ECB, these provisions do not relate to the appointment of NCB top officials. Therefore, institutionalized assessments remain silent on national appointment procedures. Like in 2004, the most common procedure to appoint central bank governors in SEE is election by parliament. The legal provisions for the appointment procedures for other members of the highest decision-making bodies differ considerably in the SEE countries, both between countries and between different positions. Bosnia and Herzegovina is a special case, as the appointment procedures for the central bank's highest decision-making body are based on the Dayton Peace Agreement. The recent amendment of Croatia's national bank legislation entailed a change in the composition of the Council of the Croatian National Bank, requiring all Council members to be full-time employees of the central bank.¹⁸

According to Article 14.2 of the Statute, the minimum term of office required for NCB governors is five years. These rules for the security of tenure of office should equally apply to the other members of the NCBs' decision-making bodies (see e.g. ECB, 2006b, p. 26). With respect to the legal requirements regarding the length of tenure for top officials, the situation in SEE has remained unchanged since 2004, with all analyzed central bank laws being in line with Treaty requirements (see table 2).

A related question is the issue of renewal of the mandate: The possibility of reappointment of top officials is generally seen as decreasing the level of CBI. The Statute specifies that members of the Executive Board of the ECB may not be reappointed, whereas it does not contain any rule on the reappointment of NCB governors. Reappointment of central bank governors and, in some cases,

¹⁸ Currently, the Council of the Croatian National Bank comprises the Governor, the Deputy Governor, four Vice Governors and eight external members. The transitional provisions of the amendment stipulate that the external members' term of office will end upon Croatia's EU accession. The Deputy Governor will become a Vice Governor and the remaining three Vice Governors will have to be appointed by parliament within 30 days of EU accession.

Table 2

Personal Independence of Central Banks in SEE – Part 1

	Governor		Highest Decision-Making Body		Dismissal	Incompatibility Clauses
	Term of Office	Appointment	Composition and Term of Office	Appointment		
Bank of Albania	* 7 years * reappointment possible (Article 44.4)	* appointed by parliament, on proposal of state president (Article 44.2c)	* Supervisory Council (SC): 1 governor, 2 deputy governors, 6 other members (Article 44.1) * term of office: 7 years, reappointment possible (Article 44.4)	* appointed by parliament, 5 members proposed by parliament, 3 by council of ministers, 1 by SC (Article 44.2)	* criminal act, bankruptcy, personal misconduct, political activities (Article 47.1) * absence from 2 SC meetings, inability to perform, serious misconduct (Article 47.2)	SC membership incompatible with (Article 46): employment by or holding significant shares of a commercial bank or other institution licensed by the Bank of Albania
Central Bank of Bosnia and Herzegovina	* 6 years * reappointment possible (Article 8.4)	* governor appointed by members of Governing Board (Article 8.2b)	* Governing Board: 5 members (Article 8.2a) * term of office: 6 years, reappointment possible (Article 8.4)	Governing Board members appointed by the presidency (Article 8.2a)	* violation of currency board arrangement rule, criminal act, bankruptcy, personal misconduct (Article 11.1a–e) * inability to perform, absence from more than half of Governing Board meetings in previous year (Article 11.2)	Governing Board membership incompatible with appointment/election (Article 10): * presidency * parliament * constitutional court * government
Bulgarian National Bank	* 6 years (Article 12.4)	* elected by parliament (Article 12.1)	* Governing Council: 1 governor, 3 deputy governors, 3 other members (Article 11.1) * term of office: 6 years (Article 12.4)	* 3 deputy governors elected by parliament, on governor's proposal (Article 12.2) * other 3 members appointed by president of state (Article 12.3)	* inability to perform functions for more than 6 months * serious misconduct * conditions required under Article 11.4 no longer fulfilled (Article 14.1)	* governor and deputy governors shall not perform any other remunerated activity (Article 12.5) * other 3 members: no other activity at the BNB or other financial institutions, no activity in the executive branch (Article 12.6) * all members: imprisonment, bankruptcy, member of managing or supervisory body of company 2 years before insolvency of company (Article 11.4)
Croatian National Bank	* 6 years (Article 40.5)	* appointed by parliament, on proposal of parliamentary committees (Article 40.1)	* Council: 1 governor plus 8 vice-governors (Articles 38.1 and 40.2) * term: 6 years (Article 40.5)	* vice governors appointed by parliament on proposal of parliamentary committees (Article 40.3)	* incompatibility according to Article 41 * criminal act * serious misconduct or lack of moral or professional integrity according to Council * inability to perform * false statements related to Article 41 (Article 42.1a–f)	* Council members "... shall be full-time employees ..." (Article 41.1) Council membership incompatible with position in: * parliament, government, local government, trade union, political party (Article 41.2) * ownership or management position in commercial banks (Articles 41.2, 41.3)

Table 2

Personal Independence of Central Banks in SEE – Part 2						
	Governor		Highest Decision-Making Body		Dismissal	Incompatibility Clauses
	Term of Office	Appointment	Composition and Term of Office	Appointment		
National Bank of the Republic of Macedonia	* 7 years, one reappointment possible (Article 70)	* appointed by parliament, on proposal of state president (Article 70)	* National Bank Council: 1 governor, 2 vice governors, 6 external members (Article 57) * term of office: 7 years (Articles 60 and 72)	* vice governors appointed by parliament on proposal of governor; one reappointment possible (Article 72) * external members appointed by parliament on proposal of state president, no reappointment (Article 60)	* criminal act * ban of practicing profession * illness * inability * performing functions dishonestly, unprofessionally, etc. * decision on dismissal plus explanatory note shall be published (Articles 60 and 70)	NBC membership incompatible with, inter alia (Article 58): * position in commercial banks * trade union membership * net debtor of a bank status * criminal sentence (waiting time) * party membership
Central Bank of Montenegro	* 6 years, 1 reappointment possible (Article 16)	* appointed by parliament, on proposal of parliamentary committee (Article 14)	* Council: 1 president, 1 general manager, 2 deputy general managers, 3 members (Article 14) * term of office: 6 years, 1 reappointment possible (Article 16)	* members of the Council appointed by parliament; * 1 president, 1 general manager, 2 deputy general managers on proposal of parliamentary committee; * 3 other members proposed by government (Article 14)	* nonfulfillment of professional qualifications * bankruptcy procedure * conviction of crime * performing functions unprofessionally and unconscientiously * loss of ability to perform functions (Article 23)	Council membership incompatible with: * employment by a bank or ownership of more than 5% of a bank in Montenegro * conviction for criminal offenses (Article 15) * occupation of any other office or employment (Article 64a)
National Bank of Romania	* 5 years, reappointment possible (Article 33.4)	* appointed by parliament, on proposal of parliamentary committees (Article 33.3)	* Board: 1 governor, 1 senior deputy governor, 2 deputy governors, 5 external members (Article 33.2) * term of office: 5 years, reappointment possible (Article 33.4)	* appointed by parliament, on recommendation of parliamentary committees (Article 33.3)	* inability * serious misconduct (Article 33.6)	Board members have to work on full-time basis (Article 34.4) Board membership incompatible with appointment/election inter alia (Article 34): * parliament * political affiliation * public administration
National Bank of Serbia	* 5 years, reappointment possible (Article 16)	* appointed by parliament, on proposal of parliamentary committee (Article 16)	* Monetary Board: 1 governor, 3 to 5 vice governors (Article 13, Article 19)	* vice governors appointed by the NBS Council, on proposal of governor; reappointment possible (Article 19)	* criminal act * incompetence, mistakes * inability to perform functions with regard to Article 28 (Article 30)	Monetary Board and Council membership incompatible with appointment/election inter alia (Article 28): * parliament * government * local government * trade union membership * bank management or ownership

Source: See table 1.

of other top officials, is possible in most SEE countries, while no explicit reference can be found in the central bank laws of Bulgaria and Croatia.¹⁹

The most disputed area in the field of personal independence concerns the rules for removal from office of central bank top officials. According to Article 14.2 of the Statute, NCB governors may only be dismissed for the following reasons: if they no longer fulfill the conditions required for the performance of their duties or if they have been guilty of serious misconduct. The ECB argues that these rules should also pertain to the other members of the NCBs' decision-making bodies (see ECB, 2006b, pp. 33–34). Since 2004, provisions on the dismissal of the highest decision-making bodies' members have been amended in Bulgaria, Croatia and the Republic of Macedonia. Yet none of these amendments has been judged by the European Commission to be sufficient to ensure full compliance with Treaty requirements, so that currently only Romania's central bank law is fully in line with the Treaty in this area (European Commission, 2005d, p. 51). In Bulgaria, the amended central bank law limits the reasons for dismissal to the two reasons stipulated by Article 14.2 of the Statute. However, Article 14.1 of the amended Bulgarian law still makes reference to Article 11.4 of the same law, which defines persons who may not become members of the Governing Council, thus indirectly introducing three additional reasons for dismissal. While the Bulgarian National Bank (BNB) defended this amendment, stating that it reduces the reasons for dismissal to a maximum extent (see Grozev, 2006, p. 123), the European Commission gave a critical assessment on this amended provision in its Comprehensive Monitoring Report 2005, requiring some "minor adjustments ... concerning the dismissal of members of the Governing Council ..." (European Commission, 2005b, p. 47).²⁰ In this context, it is interesting to note that legal provisions on reasons for dismissal are also not undisputed in some other EU Member States.²¹ In the most recent amendment of the Croatian central bank law, one provision on possible reasons for dismissal was deleted while several others were retained after the European Commission had criticized them in its Progress Report 2005 on Croatia (see European Commission, 2005c, p. 74). The provision is still not in line with Treaty requirements and will have to be further adapted. In a similar vein, the recent amendment of the central bank law of the Republic of Macedonia seems to be a reaction to the criticism expressed by the opinion on the Republic of Macedonia in this area (European Commission, 2005a, p. 91). Articles 60 and 70 of the amended law provide for the publication of an explanatory note in the case of a dismissal decision. While this provision can be seen as increasing the transparency of such decisions, it seems doubtful whether it will be assessed as complying with Treaty requirements. For the other SEE central bank laws,

¹⁹ In particular, Article 11.4 of the Bulgarian central bank law defines persons who may not become members of the Governing Council as persons "sentenced to imprisonment ...," "adjudicated in bankruptcy ..." and "previous members of a managing or supervisory body of a company ..." before its insolvency."

²⁰ As a case in point, the ECB's Convergence Report 2006 gives a critical assessment on legislation in the Czech Republic, Latvia, Poland, Slovakia and Hungary (see ECB, 2006b, p. 210, p. 219, p. 228, p. 230 and p. 222, respectively).

²¹ The absence of a provision on reappointment, however, implies that reappointment of top officials is possible. As a case in point, Zelko Rohatinski was reappointed as central bank governor of the Croatian National Bank in June 2006.

the need for adjustments is considerable. Currently legislated reasons for dismissal in Albania, Bosnia and Herzegovina, Montenegro, and Serbia are likely to be criticized by the European Commission in the future.

2.4 Financial Independence

As in 2004, the author uses a broad definition of the term “financial independence.” It covers two aspects: first, budgetary independence (comprising rules on the management of the central bank’s budget, ownership issues, allocation of central bank profits and coverage of potential losses) and second, the issue of prohibition of monetary financing, given its importance for CBI. Interestingly, this issue has not always been included in the Convergence Reports. In fact, the European Commission included the examination of the prohibition of monetary financing for the first time in its 2004 Convergence Report (see European Commission, 2004, p. 9), the ECB followed in 2006 (see ECB, 2006a, pp. 67–68 and ECB, 2006b, pp. 28–30, respectively).²² As will be shown below, the issues of budgetary and financial independence are closely interrelated.

While the Treaty and the Statute do not contain explicit provisions on the NCBs’ budgetary independence, the ECB argues that a fully independent NCB should be able to avail itself autonomously of the appropriate economic means to fulfill its mandate and – after EU accession – to perform its ESCB-related tasks (see ECB, 2006b, p. 36). In particular, ex ante influence on an NCB’s financial means by external bodies is regarded as jeopardizing the NCB’s independence, while ex post reviews of its financial account may be seen as a reflection of accountability (ECB, 2006b, p. 37).

As in 2004, all SEE central bank laws stipulate that the central bank’s budget is managed by the bank’s highest decision-making body independently from any government institution (see table 3). Amendments pertaining to the allocation of profits have been enacted by Bosnia and Herzegovina and by the Republic of Macedonia. The amended central bank law of Bosnia and Herzegovina abolished the special reserves and – after the allocations to the general reserves – provides for a 40% share of remaining profits to be allocated to the bank’s reserves instead.²³ The amended legislation of the Republic of Macedonia brought about an increase in the share of profits to be allocated to the central bank’s general reserves.²⁴

While provisions on profit allocation are largely unproblematic in terms of CBI, the European Commission argues that provisions on the coverage of potential central bank losses may in some cases involve a form of monetary financing. In particular, if the central bank’s losses may be covered by a transfer of government securities from the budget to the central bank’s balance sheet and these securities have to be redeemed from the central bank’s profit in the

²² The logic of this approach was that – according to Article 116 of the Treaty – the prohibition of monetary financing and privileged access is a Stage Two requirement. It is worth noting that the issue is dealt with separately from NCB independence issues by the Convergence Reports.

²³ Prior to the amendment, profits had to be allocated to general reserves up to a specified maximum amount. The remaining part could be used for building up special reserves with no specified upper limit. Only the remaining part of profits had to be transferred to the fiscal authorities (see Dvorsky, 2004, p. 61).

²⁴ While formerly only 20% of the central bank’s net income had been allocated to the bank’s general reserves, this share was increased to 70%.

Table 3

Financial Independence of Central Banks in SEE

	Limits to Government Lending		Budgetary Independence		
	Direct Credit	Indirect Credit	Ownership and Management of Budget	Allocation of Profit	Coverage of Potential Losses
Bank of Albania	* loans with a maturity of up to 6 months permitted (Article 30.2) * maximum: 5% of average budgetary revenues of past 3 years (Article 30.4), waiver: 8% of revenues (Article 30.5)	purchases of government securities in the secondary market permitted (Article 32)	* capital owned by the state (Article 6.3) * budget determined by Supervisory Council (Article 43.n)	* 25% of profits allocated to general reserve fund up to 500% of paid-up capital (Article 9) * repayment of previous loss coverage (Article 10.1) * residual profits paid to state budget (Article 10.2)	net losses covered by Ministry of Finance (Article 7)
Central Bank of Bosnia and Herzegovina	prohibited (Article 67.1)	prohibited (Article 67.1)	* budget determined by Governing Board (Article 7.j)	* profits allocated to general reserve so that initial capital plus general reserve equal 5% of monetary liabilities (Article 27a) * remaining profit: 40% allocated to increase of general reserve, 60% to fiscal authorities (Article 27b)	* net losses covered by general reserve (Article 28b) * residual covered by the Ministry for Budget (Article 29b)
Bulgarian National Bank	prohibited (Article 45.1)	prohibited (Article 45.1)	* approval of annual budget by Governing Council (Article 16.13) * the BNB addresses the approved annual budget to parliament (Article 50)	* 25% of profits allocated to reserve fund (Article 8.2) * necessary amounts to be allocated to special funds (Article 8.3) * residual to state budget (Article 8.4)	* losses covered by reserve fund and special reserve account of BNB (Articles 8 and 9) * residual covered by Ministry of Finance (Article 9.1)
Croatian National Bank	prohibited (Article 36.1)	purchases of government securities in the secondary market permitted (Article 36.3)	* capital held exclusively by state (Articles 2.9 and 50.2) * Council adopts financial plan (Article 38.3b)	* profits allocated to general reserves within defined limits (Article 53.2) * residual to state budget (Article 53.3)	* losses covered by general reserves (Article 53.4)
National Bank of the Republic of Macedonia	prohibited (Article 51)	no provision	* sole state ownership (Article 5) * National Bank Council adopts financial plan (Article 64.4)	* unrealized income from price and exchange rate fluctuations allocated to revaluation reserves * 70% of residual amount allocated to general reserves until level of core capital is reached and up to 15% after core capital was reached * residual to state budget (Article 89)	* losses covered by general reserves * residual covered by state budget (Article 89a)
Central Bank of Montenegro	prohibited "except under certain conditions" (Article 3)	purchases of government securities in the secondary market permitted (Article 33a)	* annual financial plan adopted by the Council and furnished to government for information only (Article 56)	* general reserves, up to 5% of total amount of credit balances (Article 54) * residual to state budget (Article 54)	* losses covered by general reserves or by founding capital, in that order (Article 54)
National Bank of Romania	prohibited (Article 6.1 and Article 29.1)	purchases of government securities in the secondary market permitted (Article 6.3)	* capital owned by state (Article 38.1) * annual budget approved by the Board (Article 41)	* 80% of profit allocated to state budget (Article 43.1) * residual to statutory reserves, own financing sources and employee profit-sharing scheme (Article 43.5)	* losses covered by special revaluation account and statutory reserves (Article 44)
National Bank of Serbia	* permitted to cover "temporary illiquidity of the budget" (Article 39.1) * maximum 5% of average budget revenue of past 3 years (Article 39.2)	no provision	* Council adopts financial plan on proposal of governor (Article 24.1) * Governor decides on use of special reserves (Article 78) * ex ante submission of financial plan for following year to the parliament (Article 80)	* maximum of 30% of surplus allocated to special reserves * residual to state budget (Article 77)	* losses covered by special reserves * residual covered by state budget (Article 77)

Source: See table 1.

following years, this may potentially involve a form of monetary financing “to the extent that the central bank is obliged to acquire them” (see e.g. European Commission, 2004, p. 82, on Croatia or 2005a, p. 91, on the Republic of Macedonia). In order to comply with the Commission’s requirements in this area, the amendment to the Croatian central bank law deleted these potentially problematic provisions. The Bulgarian central bank law – which had been criticized in the 2004 Progress Report for containing a similar provision (European Commission, 2004b, p. 79) – was also amended and is now in full compliance with Treaty requirements in this field. The central bank laws of Albania and Serbia contain similar provisions on the coverage of losses, which by analogy are not compatible with Treaty requirements either.

As to the prohibition of monetary financing, the legal basis can be found in Article 101 (1) of the Treaty, as restated in Article 21.1 of the Statute, which stipulates that overdrafts or any other type of credit facility with the ECB or with the NCBs in favor of Community institutions or bodies, central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of Member States are prohibited, as is the purchase directly from them by the ECB or NCBs of debt instruments.²⁵ The Treaty does not contain a prohibition of indirect central bank credit. As compared with 2004, the situation has remained broadly unchanged in this area: Five of the eight SEE central bank laws analyzed explicitly prohibit direct central bank lending (see table 3). Major adjustments will be necessary in Albanian and Serbian legislation in the area of direct central bank credit (for details, see Dvorsky 2004, p. 63), while clarification may be needed on the provisions of Montenegro.²⁶ Furthermore, a number of smaller adjustments will be necessary in the other SEE laws to achieve full compliance with Treaty requirements (see e.g. Dvorsky, 2005, p. 84, on the Republic of Macedonia).

3 Conclusions

Since 2004, some SEE countries have achieved further progress in aligning central bank legislation with Treaty requirements. As in 2004, the degree of CBI continues to correspond largely to the respective country’s level of integration with the EU.²⁷

Looking at the legal aspects of CBI in more detail, the results can be summarized as follows: First, a main weakness can be still found in the area of personal independence, in particular as regards the provisions on the dismissal of central bank top officials, notwithstanding recent amendments in this area. Second, the prohibition of monetary financing is a highly crucial issue: While direct central bank credit is prohibited in five of the eight countries examined, major adjustments are necessary in Albania and Serbia and smaller ones in

²⁵ *Complementary to the prohibition of direct central bank lending to the government, Article 102 (1) of the Treaty prohibits privileged access of public authorities to financial institutions.*

²⁶ *In particular, the phrase “except under certain conditions” in Article 3 is likely to be questioned and will have to be removed in order to comply with Treaty requirements.*

²⁷ *This is very similar to the overall state of structural reforms in SEE countries: As a case in point, the European Bank for Reconstruction and Development (EBRD) Transition Report finds that in 2006 the biggest progress was achieved by Bulgaria, Croatia and Romania, where the European Commission’s pressure to fulfill accession requirements seems to have played a crucial role. Of the remaining five SEE countries, the Republic of Macedonia was found to be the leading reformer (see EBRD, 2006, pp. 2–12).*

several other countries. Third, the provisions on loss coverage still have to be adapted in a number of countries. Fourth, regarding institutional independence, most central banks in SEE are vested with the formal responsibility of designing and implementing monetary policy in their countries. Special cases are the currency board arrangements in Bulgaria as well as Bosnia and Herzegovina, and the unilateral euroization of Montenegro. Fifth, in the field of functional independence, the legal provisions in most SEE countries regarding primary objectives are largely in line with Treaty requirements.

While a central bank's legal status provides an important benchmark for assessing CBI in the respective country, it has to be emphasized that the actual implementation of central bank legislation plays an equally important role.²⁸ Legal arrangements to protect the status of the central bank are a necessary, though not sufficient, prerequisite for CBI. In fact, the importance of practical implementation cannot be overestimated.

Cutoff date for data: January 31, 2007.

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²⁸ A case in point is the history of appointments and withdrawals of central bank governors in SEE countries. The analysis clearly shows that in practice, the central banks were not free from political interference (see Dvorsky, 2004, pp. 69–71, and Dvorsky, 2007). Furthermore, the political readiness of national parliaments to change the central bank law in the sense of decreasing the level of CBI turns out to be a crucial issue.

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Are the Exchange Rates of EMU Candidate Countries Anchored by their Expected Euro Locking Rates?

This paper examines whether the exchange rates of the Czech koruna, the Hungarian forint and the Polish złoty were anchored by the market expectations for their euro locking rates in the period from December 15, 2004, to August 3, 2006. First, I derive the process of the exchange rate as a function of the processes of the following three factors: latent exchange rate, market expectations for the euro locking rate and locking date. Then the expected final conversion rates are filtered. The time-varying volatilities of the state variables are estimated from cross-sectional data on option prices.

Anna Naszódi¹

1 Introduction

This paper investigates the stabilizing feature of market expectations for the euro locking rate. The analysis is applied to three Economic and Monetary Union (EMU) candidate countries: the Czech Republic, Hungary and Poland. First, an economic model is constructed where the exchange rate is a function of three factors, namely the latent exchange rate², the market expectations for the final conversion rates and the locking dates. Then, in the empirical part of the paper, the historical exchange rate changes are decomposed into changes of each of the factors. In order to filter the factors, some parameters need to be estimated or calibrated. To estimate the time-varying volatilities of the filtered factors, a theoretical option pricing model is derived in the paper and cross-sectional data on option prices with different maturities are used. The identification of the time-varying volatilities is based on the following: Options with longer maturities depend more on the volatility of one of the filtered factors than options with shorter maturities. By investigating the filtered market expectation of the euro locking rate, I make inferences about the exchange rate-stabilizing effect of locking.

Rather than filtering market expectations for the locking rate, it would have been possible to derive the market expectations from an alternative source (Reuters polls) or with an alternative method (estimating equilibrium exchange rates). However, for the reasons outlined below, filtering has some advantages over its alternatives.

Reuters regularly surveys the expectations of analysts regarding the entry dates to EMU and the exchange rate mechanism II (ERM II) and regarding the central parities in ERM II. The central parity expected by respondents may be considered as the market expectations for the final conversion rate. Yet extracting market expectations for the final conversion rate from daily historical exchange rate data may yield more accurate and more up-to-date information than the monthly or quarterly Reuters polls. Moreover, the higher

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² The latent exchange rate is defined as the exchange rate that would prevail if the currencies were not going to be locked against the euro.

frequency of the filtered expectations enables us to investigate the stabilizing effect the prospect of locking has on the exchange rate.

As EMU candidate countries aim at having their final irrevocable conversion rates set equal to their equilibrium exchange rates, reliable estimates on the latter also reflect market expectations for the final conversion rate. Yet in the context of our research this concept poses at least three kinds of problems.³ First, economists use a number of concepts to define, and a number of methods⁴ to estimate, the equilibrium real exchange rate. Second, these estimates refer to the real rather than the nominal exchange rate. Third, market expectations might deviate from the estimated nominal equilibrium exchange rate, especially if the choice of the final conversion rate is based not only on economic, but also on political considerations.

The novelty of this paper is that it filters the subjective market expectations for the final conversion rate, which not only mirrors economic but also possible political considerations. By comparing the time series of the filtered subjective market expectations with the time series of the historical exchange rate we can make inferences about the stabilizing effect of locking on the exchange rate.

With regard to market expectations for the time of locking, the Reuters polls appear to yield reliable results, which are therefore also used in this paper. Csajbok and Rezessy (2005), for instance, estimate the expected euro area entry date of Hungary from the forint and euro yield curves and find the estimates to be relatively close to analysts' expectations provided by the Reuters polls.

The paper is structured as follows: Section 2 presents the exchange rate model. Section 3 derives an option pricing formula used to estimate parameters in the empirical part of the paper. In section 4 I start by defining the filtering problem, then I show how the parameters are set and finally I present the results of the Kalman filtering. Section 5 concludes.

2 Exchange Rate Model

The exchange rate model is similar to Krugman's target-zone model (1991). First, in Krugman (1991) the target-zone exchange rate is derived from the fundamental. Similar to Krugman's approach our starting point is that the exchange rate subject to future locking is a function of the fundamental v . Second, in Krugman's model the logarithm of the target-zone exchange rate is equal to the fundamental plus a term proportionate to the conditional expected change of the logarithm of the exchange rate. Moreover, the exchange rate would be equal to the fundamental if there were no target zone. In our model the log exchange rate subject to future locking is equal to the fundamental plus a term proportionate to the conditional expected instantaneous change of the log exchange rate. In the absence of future locking, the term proportionate to

³ *Égert, Halpern and MacDonald (2006) survey a number of issues related to the equilibrium exchange rates of transition economies. They conclude that "...deriving a precise figure for the equilibrium real exchange rates in general and also for the transition economies is close to mission impossible as there is a great deal of model uncertainty related to the theoretical background and to the set of fundamentals chosen."*

⁴ *Williamson (1994) gives an overview of the widely used methods: Fundamental Equilibrium Exchange Rate (FEER), Behavioral Equilibrium Exchange Rate (BEER), NATural Real Exchange (NATREX).*

the conditional expected instantaneous change of the exchange rate would be zero, so that the exchange rate would be equal to the fundamental. Given this relationship, the fundamental v is referred to as the log latent exchange rate, i.e. the exchange rate that would prevail if the currency was not going to be locked against the euro at some point.

Third, the implicit relationship between the target-zone exchange rate and the fundamental in Krugman's model is the same as the relationship between the exchange rate subject to future locking and the latent exchange rate in this model. This relationship can be expressed as follows in a reduced form:⁵

$$s_t = v_t + c \frac{E_t(ds_t)}{dt} \quad (1)$$

Here, s_t is the log exchange rate and v_t is the log latent exchange rate. The constant c is the time scale. The term $\frac{E_t(ds_t)}{dt}$ is the expected⁶ instantaneous change of the exchange rate.

While Krugman investigates the stabilizing feature of the target zone with a floating regime as a benchmark, this contribution explores the stabilizing effect of future locking on the exchange rate as compared with a "no locking" benchmark regime.

In the following, the latent exchange rate v_t is defined as a function of some macro variables, as explained in (4f) of footnote 5:

$$v_t = -\alpha y_t + q_t + c\Psi_t - p_t^* + m_t + ci_t^* \quad (2)$$

In this respect, y denotes domestic real output, q is the real log exchange rate, Ψ is the risk premium, p^* is the foreign log price, m denotes the domestic nominal money supply and i^* denotes the foreign interest rate. For the sake of simplicity, p^* , m and i^* are assumed to be constant and normed to 0.

As mentioned above, the EMU candidates will aim to have their exchange rates fixed at their equilibrium levels, for which the concept of the behavior equilibrium exchange rate (BEER) is chosen. Given that the strong law of purchasing power parity (PPP) should hold for the locking rate under this equilibrium concept, the log nominal exchange rate at the time of locking is equal to the difference between the domestic and foreign log prices:

⁵ Svensson (1991) presents one possible structural model for the reduced form (1):

(1f) $m_t - p_t = \alpha y_t - ci_t$ $\alpha > 0$ $c > 0$ money market equilibrium

(2f) $q_t = s_t + p_t^* - p_t$ real exchange rate

(3f) $\Psi_t = i_t - i_t^* - \frac{E(ds_t)}{dt}$ risk premium

(4f) $v_t = -\alpha y_t + q_t + c\Psi_t - p_t^* + m_t + ci_t^*$ fundamental/latent exchange rate

In this model the parameter C can be interpreted as the interest rate elasticity of the money demand.

⁶ Two different types of expectations are considered in this paper. One is the subjective market expectation and the other is the mathematical expected value of a random variable. Here, reference is made to the latter. In order to distinguish between the two, the first type of expectation is referred to as market expectation. However, under rational expectations the two are the same.

$s_T = p_T - p_T^*$. Under rational expectations the market expects the final conversion rate at time t to be $x_t = E_t(s_T)$, which gives

$$x_t = p_t + \int_t^{T_t} E_t(\pi_\tau) d\tau \quad (3)$$

where π denotes the inflation rate.

Neither the definitions (2) and (3) nor the corresponding macrodata are used directly in the empirical part of the paper – mainly because of the low frequency of these data, but also because of a possible misspecification of the underlying macro models. For instance, the examples of the current EMU countries show that the locking rates caused deviations from the strong law of purchasing power parity. Still, it is the equilibrium real exchange rate that should be the key determinant of the locking rate chosen on the basis of economic considerations. Therefore, while not used directly in the following, these definitions motivate the interpretation of our results and the choice of the processes assumed for the underlying factors of the model.

2.1 Dynamics

In this subsection the processes of the factors are specified. These processes will be used to derive the process of the exchange rate.

We start by assuming that all three factors, i.e. T_t , v_t and x_t , follow Brownian motions. First, the process of market expectations regarding the log euro locking rate, x_t , can be derived from equation (3) and expressed in a discrete time framework as $\Delta x_t = [\pi_{t+1} - E_t(\pi_{t+1})] + \sum_{i=t+2}^{T_t} [E_{t+1}(\pi_i) - E_t(\pi_i)]$. Under the assumptions that both expectation errors and changes in expectations are independent and normally distributed with zero mean, the process of x_t can be rewritten in a continuous time framework as

$$dx_t = \begin{pmatrix} \sigma_{x,t} dz_{x,t} & \text{if } t < T_t \\ 0 & \text{otherwise} \end{pmatrix} \quad (4)$$

where $dz_{x,t}$ is a Wiener process.

Second, the discrete time process of the log latent exchange rate, v_t , can be derived from (2), (4) and from two additional equations of the model.⁷

By defining χ_t by its discrete corresponding process as $\Delta \chi_t = (\alpha + \gamma)\beta \sum_{i=t+2}^{T_t} [E_{t+1}(\pi_i) - E_t(\pi_i)] + c\Delta \psi_t$ the process of the latent exchange rate is $dv_t = -(\alpha + \gamma)\beta \sigma_{x,t} dz_{x,t} + d\chi_t$. If χ_t is assumed to follow Brownian motion then the continuous time process of the log latent exchange rate is

$$dv_t = \sigma_{v,t} dz_{v,t} \quad (5)$$

where $dz_{v,t}$ is a Wiener process. By assuming the expectation error $(\pi_{t+1} - E_t(\pi_{t+1}))$ to be orthogonal to the sum of changes of expectations $(\sum_{i=t+2}^{T_t} [E_{t+1}(\pi_i) - E_t(\pi_i)])$, and by assuming the risk premium ψ_t to be

⁷ The model is extended with a supply curve and an equation capturing the Balassa-Samuelson effect:

$$(5f) y_t - y_{t-1} = \beta(\pi_t - E_{t-1}(\pi_t)) \quad \beta > 0 \text{ supply curve}$$

$$(6f) dq_t = -\gamma dy_t \quad \gamma > 0 \text{ Balassa-Samuelson effect (real appreciation).}$$

orthogonal to both the expectation error and the sum of changes of expectations, we find the correlation between $dz_{v,t}$ and $dz_{x,t}$ to be

$$\rho(dz_{v,t}, dz_{x,t}) = -(\alpha + \gamma)\beta \frac{\sigma_{x,t}}{\sigma_{v,t}}. \quad (6)$$

Third, the assumed process of market expectations regarding the time of locking, T_t , is the following martingale:

$$dT_t = \begin{cases} (T_t - t)\sigma_{T,t} dz_{T,t} & \text{if } t < T_t \\ T^* & \text{otherwise} \end{cases} \quad (7)$$

where $dz_{T,t}$ is a Wiener process.

Given that EMU candidates need to fulfill the Maastricht criteria, the market expectations regarding the time of locking T_t depend on both inflationary and fiscal shocks. The market expectation for the log final conversion rate x_t reacts mainly to the inflationary shocks, whereas the log latent exchange rate v_t is more strongly related to real output and hence to fiscal shocks. T_t , in turn, depends on x_t (the log final conversion rate) and on v_t (the log latent exchange rate). To be more precise, higher uncertainty relating to x_t and v_t makes T_t more volatile. Moreover, the higher the interest rate elasticity of money demand c , the more efficient monetary policy can be by influencing inflation and output – in other words, the less dependent on x_t and v_t the expected time of locking will be.

Along these lines it is possible to make restrictions on the process of the expected time of locking. However, the restrictions to be posed are not uniquely determined by the above intuitive requirements. In this paper, the restrictions (8) and (9) below were chosen for technical reasons, motivated by the demand for an analytical solution to the functional relationship $s_t = f(t, v_t, x_t, T_t)$.

$$\rho(dz_{T,t}, dz_{x,t}) \frac{\sigma_{x,t}}{x_t} = \frac{1}{c} (T_t - t) \sigma_{T,t} \quad (8)$$

$$\rho(dz_{T,t}, dz_{v,t}) \frac{\sigma_{v,t}}{v_t} = \frac{1}{c} (T_t - t) \sigma_{T,t}. \quad (9)$$

2.2 Functional Relationship between the Exchange Rate and Underlying Factors

To obtain the functional relationship $s_t = f(t, v_t, x_t, T_t)$ between the log exchange rate on the one hand and the log latent exchange rate v_t as well as market expectations for the log final conversion rate x_t and the time of locking T_t on the other hand, Itô's stochastic change-of-variable formula is used.⁸

$$s_t = f(t, v_t, x_t, T_t) = \left(1 - e^{-\frac{T-t}{c}}\right) v_t + e^{-\frac{T-t}{c}} x_t. \quad (10)$$

⁸ Proof is available from the author upon request.

This function satisfies (1), (8) and (9), Ito's formula given by (11) and the terminal condition (12).

$$\begin{aligned}
 df = & \left[\frac{\partial f}{\partial t} + \frac{\partial f}{\partial v_t} \mu_{v,t} + \frac{\partial f}{\partial x_t} \mu_{x,t} + \frac{\partial f}{\partial T_t} \mu_{T,t} + \frac{1}{2} \frac{\partial^2 f}{\partial v_t^2} \sigma_{v,t}^2 + \frac{1}{2} \frac{\partial^2 f}{\partial x_t^2} \sigma_{x,t}^2 + \right. \\
 & + \frac{1}{2} \frac{\partial^2 f}{\partial T_t^2} \sigma_{T,t}^2 (T_t - t)^2 + \frac{1}{2} \frac{\partial^2 f}{\partial T_t \partial x_t} \rho(dz_{T,t}, dz_{x,t})(T_t - t) \sigma_{T,t} \sigma_{x,t} + \\
 & \left. + \frac{1}{2} \frac{\partial^2 f}{\partial T_t \partial v_t} \rho(dz_{T,t}, dz_{v,t})(T_t - t) \sigma_{T,t} \sigma_{v,t} + \frac{1}{2} \frac{\partial^2 f}{\partial x_t \partial v_t} \rho(dz_{v,t}, dz_{x,t}) \sigma_{v,t} \sigma_{x,t} \right] dt + \\
 & + \frac{\partial f}{\partial v_t} \sigma_{v,t} dz_{v,t} + \frac{\partial f}{\partial x_t} \sigma_{x,t} dz_{x,t} + \frac{\partial f}{\partial T_t} (T_t - t) \sigma_{T,t} dz_{T,t}.
 \end{aligned} \tag{11}$$

$$f(T^*, v_{T^*}, x_{T^*}, T^*) = x_{T^*}. \tag{12}$$

Equation (10) shows that the log exchange rate is the weighted average of the log latent exchange rate and the expected log final conversion rate. The weights change over time; if the time until locking is infinite or, in other words, if the currency will not be locked, then the weight of the latent exchange rate is 1 and the weight of the expected final conversion rate is 0. As the time until the locking decreases, the weight of the expected final conversion rate increases. Finally, as the time until locking approaches 0, the weight of the expected final conversion rate approaches 1.

In order to examine the dynamics of the exchange rate, equation (11) is

rewritten as follows: By substituting (8), (9) and (10) and $v_t = \frac{1}{1-e^{-\frac{T-t}{c}}} s_t - \frac{e^{-\frac{T-t}{c}}}{1-e^{-\frac{T-t}{c}}} x_t$ into equation (11) we obtain

$$\begin{aligned}
 ds_t = & \frac{1}{c} \frac{e^{-\frac{T-t}{c}}}{1-e^{-\frac{T-t}{c}}} (x_t - s_t) dt + \left(1 - e^{-\frac{T-t}{c}} \right) \sigma_{v,t} dz_{v,t} + \\
 & + e^{-\frac{T-t}{c}} \sigma_{x,t} dz_{x,t} - \frac{1}{c} \frac{e^{-\frac{T-t}{c}}}{1-e^{-\frac{T-t}{c}}} (x_t - s_t) (T_t - t) \sigma_{T,t} dz_{T,t}.
 \end{aligned} \tag{13}$$

Equation (13) shows the dynamics of the exchange rate to be such that it converges to the actual market expectation for the final conversion rate. Moreover, the closer the time of locking, the faster the convergence is.

Equations (4), (5), (7) and (10) define a three-factor model. One factor is the market expectation for the final conversion rate; another factor is the market expectation for the time of locking; the third factor is the latent exchange rate. This model is linear in two of the factors, but not in T_t .

3 Option Pricing

This section presents a pricing formula for European-type options that fits our model. This option pricing formula is used to estimate the time-varying volatilities of the filtered factors. The historical option prices are given in terms

of implied volatility; consequently, the option prices are derived in terms of volatility as well.

In the theoretical model the uncertainty is present due to the stochastic innovations $(dz_{v,t}, dz_{x,t}, dz_{T,t})$ of the factors; consequently, the price of an option is a function of the variances and covariances of these normally distributed innovations. From equation (13), we can derive that the instantaneous variance of the log changes of the exchange rate at time t is

$$\begin{aligned} \sigma_{s,t}^2 = & \sigma_{s,t}^{*2} + \left(\frac{1}{c} \frac{e^{-\frac{T-t}{c}}}{1 - e^{-\frac{T-t}{c}}} \right)^2 (x_t - s_t)^2 (T-t)^2 \sigma_{T,t}^2 + \\ & -2 \frac{1}{c} \frac{e^{-\frac{T-t}{c}}}{1 - e^{-\frac{T-t}{c}}} (x_t - s_t) (T-t) \sigma_{T,t} \left(1 - e^{-\frac{T-t}{c}} \right) \sigma_{v,t} \rho(dz_{T,t}, dz_{v,t}) + \\ & -2 \frac{1}{c} \frac{e^{-\frac{T-t}{c}}}{1 - e^{-\frac{T-t}{c}}} (x_t - s_t) (T-t) \sigma_{T,t} e^{-\frac{T-t}{c}} \sigma_{x,t} \rho(dz_{T,t}, dz_{x,t}) \end{aligned} \quad (14)$$

where $\sigma_{s,t}^{*2}$ is

$$\sigma_{s,t}^{*2} = \left(1 - e^{-\frac{T-t}{c}} \right)^2 \sigma_{v,t}^2 + \left(e^{-\frac{T-t}{c}} \right)^2 \sigma_{x,t}^2 + 2 \left(1 - e^{-\frac{T-t}{c}} \right) \left(e^{-\frac{T-t}{c}} \right) \sigma_{v,t} \sigma_{x,t} \rho(dz_{v,t}, dz_{x,t}). \quad (15)$$

The magnitude of the terms of (14) other than $\sigma_{s,t}^{*2}$ are negligible compared with the magnitude of $\sigma_{s,t}^{*2}$. Consequently, these terms will be disregarded in the theoretical option pricing formula and $\sigma_{s,t}^2$ will be approximated by $\sigma_{s,t}^{*2}$. Moreover, the following simplification is made. Until now, $\sigma_{v,t}$, $\sigma_{x,t}$ and $\sigma_{T,t}$ were allowed to change over time. While we do not rule out this possibility, the influence of volatility changes on option prices would appear to be limited. The pricing formula for the stochastically changing volatility case is different from the one derived here, however, the one derived is a good approximation for the theoretical value of at-the-money options with a maximum of one-year maturity.⁹ The price of a European option in terms of volatility is approximated by

$$\begin{aligned} g(t, m, \sigma_{x,t}, \sigma_{v,t}, \rho(dz_{v,t}, dz_{x,t})) &= \left[\int_t^{t+m} \sigma_{s,\tau}^{*2} d\tau \right]^{\frac{1}{2}} = \\ &= \left[\int_t^{t+m} \left(1 - e^{-\frac{T-\tau}{c}} \right)^2 \sigma_{v,\tau}^2 + \left(e^{-\frac{T-\tau}{c}} \right)^2 \sigma_{x,\tau}^2 + \right. \\ & \left. + 2 \left(1 - e^{-\frac{T-\tau}{c}} \right) \left(e^{-\frac{T-\tau}{c}} \right) \sigma_{v,\tau} \sigma_{x,\tau} \rho(dz_{v,\tau}, dz_{x,\tau}) d\tau \right]^{\frac{1}{2}} \end{aligned} \quad (16)$$

where the option is sold at time t and the time until maturity is denoted by m .

In this formula T_τ ($\tau > t$) is stochastic and unknown at time t . In order to avoid complication coming from the stochastic nature of T_τ , T_τ is

⁹ As pointed out by Hull (1997, p. 620), "For options that last less than a year, the pricing impact of a stochastic volatility is fairly small in absolute terms. It becomes progressively larger as the life of option increases."

approximated¹⁰ by T_t . By applying this final approximation and by calculating the integrals, the option pricing formula is obtained:

$$\begin{aligned}
 g^2(t, m, \sigma_{x,t}, \sigma_{v,t}, \rho(dz_{v,t}, dz_{x,t})) = & \\
 \sigma_{v,t}^2 \left\{ m - 2ce^{-\frac{1}{c}(T_t-t-m)} + 2ce^{-\frac{1}{c}(T_t-t)} + \frac{c}{2}e^{-\frac{2}{c}(T_t-t-m)} - \frac{c}{2}e^{-\frac{2}{c}(T_t-t)} \right\} + & \\
 + \sigma_{x,t}^2 \left\{ \frac{c}{2}e^{-\frac{2}{c}(T_t-t-m)} - \frac{c}{2}e^{-\frac{2}{c}(T_t-t)} + 2ce^{-\frac{1}{c}(T_t-t-m)} \rho(dz_{v,t}, dz_{x,t}) \frac{\sigma_{v,t}}{\sigma_{x,t}} + \right. & \quad (17) \\
 - 2ce^{-\frac{1}{c}(T_t-t)} \rho(dz_{v,t}, dz_{x,t}) \frac{\sigma_{v,t}}{\sigma_{x,t}} + & \\
 \left. - ce^{-\frac{2}{c}(T_t-t-m)} \rho(dz_{v,t}, dz_{x,t}) \frac{\sigma_{v,t}}{\sigma_{x,t}} + ce^{-\frac{2}{c}(T_t-t)} \rho(dz_{v,t}, dz_{x,t}) \frac{\sigma_{v,t}}{\sigma_{x,t}} \right\}. &
 \end{aligned}$$

This option pricing formula (17) is used to estimate the time-varying volatilities $\sigma_{v,t}$, $\sigma_{x,t}$ of the filtered factors. By using formula (17) and cross-sectional data on options with different maturities but the same issuing date t , the volatilities $\sigma_{v,t}$, $\sigma_{x,t}$ can be estimated for each time t . The intuition behind the identification is that longer options are more exposed to shocks occurring in the distant future than options with shorter maturities. Or in other words, $\sigma_{x,t}$ has a higher relative weight in a longer option than in a shorter one, whereas the opposite holds for $\sigma_{v,t}$.

4 Filtering Factors

The Kalman Filter technique is applied to extract the time series of the factors from the time series of the observable exchange rate. Filtering all three factors from only one series would be overambitious and unlikely to provide robust results. Luckily, Reuters polls on the prospective euro entry dates are an alternative and reliable source of information on market expectations for locking dates. Thus, the time of locking T_t is treated as being exogenously given. As T_t is not independent of the other two factors I use the conditional distributions of x_t and v_t , where I condition on the realization of T_t . The Kalman filter technique can be applied to filter factors only if the model is linear¹¹ in all factors which are to be filtered. The log exchange rate s_t is linear in the remaining two factors, namely the latent exchange rate v_t and market expectations for the final conversion rate x_t .

4.1 Filtering Problem

Since one of the factors T_t is exogenous and since T_t is not independent of the other two factors, I have to use the conditional distributions of x_t and v_t ,

¹⁰ An alternative approximation can also be applied, where the function $h(T_t)$ is approximated by its second order Taylor series expansion around T_τ : $h(T_t) = h(T_\tau) + \frac{1}{2} \frac{\partial^2 h}{\partial T_\tau^2} (T_t - T_\tau)^2 \sigma_{T_\tau}^2 (\tau - t)$. This approximation is more precise than the one applied. The value added of applying this approximation depends highly on the magnitude of σ_{T_τ} . In our case it proved to be relatively minor.

¹¹ To filter all three factors, one should not apply the Kalman filter, as the model is not linear in T_t , but different techniques such as the extended Kalman filter or the particle filter.

where I condition on the realization of T_t . The conditional expected innovations of x_t and v_t are $\rho(dz_{T,t}, dz_{x,t})dz_{T,t}$ and $\rho(dz_{T,t}, dz_{v,t})dz_{T,t}$ respectively, where ρ denotes correlations. These expected changes of $dz_{x,t}$ and $dz_{v,t}$ are taken into account in the model by having a constant as a third state variable. The system covariance matrix $Q(t)$ is also conditional on T_t . The filtering problem can be written in the usual form:

$$\Lambda(t+1) = A(t)\Lambda(t) + w_1(t+1) \quad (18)$$

$$\Omega(t) = C(t)\Lambda(t) + w_2(t) \quad (19)$$

$$E \left[\begin{pmatrix} w_1(t+1) \\ w_2(t) \end{pmatrix} \begin{pmatrix} w_1(t+1) & w_2(t) \end{pmatrix} \right] = \begin{pmatrix} Q(t) & 0 \\ 0 & R \end{pmatrix} \quad (20)$$

In our problem, the transpose of the vector of states is $\Lambda'(t) = (v_t \quad x_t \quad 1)$.

The system matrix is
$$A(t) = \begin{pmatrix} 1 & 0 & \sigma_{v,t} \rho(dz_{T,t}, dz_{v,t}) \frac{dT_t}{\sigma_{T,t}(T_t-t)} \\ 0 & 1 & \sigma_{x,t} \rho(dz_{T,t}, dz_{x,t}) \frac{dT_t}{\sigma_{T,t}(T_t-t)} \\ 0 & 0 & 1 \end{pmatrix}.$$

The vector $w_1(t)$ is assumed to be a Gaussian vector white noise. The observable variable is the log exchange rate $\Omega(t) = s_t$. Equation (10) implies that the

observation matrix is
$$C(t) = \begin{pmatrix} 1 - e^{-\frac{T_t-t}{c}} & e^{-\frac{T_t-t}{c}} & 0 \end{pmatrix}.$$

The system covariance matrix can be written as

$$Q(t) = \begin{pmatrix} Q_{1,1}(t) & Q_{1,2}(t) & 0 \\ Q_{1,2}(t) & Q_{2,2}(t) & 0 \\ 0 & 0 & 0 \end{pmatrix}$$

where the covariance is conditional on the observed T_t , therefore

$$\begin{aligned} Q_{1,1}(t) &= \sigma_{v,t}^2 \left[1 - \rho^2(dz_{T,t}, dz_{v,t}) \right], \\ Q_{1,2}(t) &= \sigma_{v,t} \sigma_{x,t} \left[\rho(dz_{x,t}, dz_{v,t}) - \rho(dz_{T,t}, dz_{v,t}) \rho(dz_{T,t}, dz_{x,t}) \right], \\ Q_{2,2}(t) &= \sigma_{x,t}^2 \left[1 - \rho^2(dz_{T,t}, dz_{x,t}) \right]. \end{aligned}$$

The error term $w_2(t)$ is assumed to be 0. In other words, we observe the exchange rate without error and model (10) perfectly describes the relationship between the factors and the exchange rate. Hence, the variance of the observation error term R is set to 0. The Kalman filter remains valid even in this case.¹²

In our problem, the observation matrix $C(t)$, the system matrix $A(t)$ and the system covariance $Q(t)$ are changing over time.

¹² See Harvey (1990, p. 108) for a detailed discussion.

The parameters of the observation matrix c , T_t and the parameters $\sigma_{v,t}$, $\sigma_{x,t}$, $\sigma_{T,t}$, $\rho(dz_{v,t}, dz_{x,t})$, $\rho(dz_{T,t}, dz_{x,t})$ and $\rho(dz_{T,t}, dz_{v,t})$ of the system covariance $Q(t)$ and of the system matrix $A(t)$ need to be either calibrated or estimated. Moreover, the initial values x_{t_0} and v_{t_0} of the factors belonging to the beginning of the sample period $t_0 = \text{Dec. 15, 2004}$, need to be set as well. The next section describes how these parameters are estimated and how T_t is set.

4.2 Parameters

First, I describe how T_t is set based on Reuters polls. Then, I show how the parameters x_{t_0} , v_{t_0} , $\rho(dz_{v,t}, dz_{x,t})$, $\rho(dz_{T,t}, dz_{x,t})$, $\rho(dz_{T,t}, dz_{v,t})$ and $\sigma_{T,t}$ are calibrated. Finally, I describe how the parameters $\sigma_{v,t}$, $\sigma_{x,t}$ and c are estimated from historical option prices and exchange rate data.

For calibrating the expected time of locking T_t , I take into consideration that the exchange rates of the countries that entered the ERM II system in recent years were almost fixed: The volatility of the Estonian kroon, the Lithuanian lita, the Slovenian tolar, the Cyprus pound and the Maltese lira dropped below 1% after entering ERM II.¹³ This finding implies that locking does not take place when a country enters EMU, but rather when it enters the ERM II regime. Therefore, the locking dates are modeled as ERM II entry dates and the parameter of locking dates is set equal to the average expectations of analysts derived from monthly and quarterly Reuters polls about ERM II entry dates for the Czech Republic, Poland and Hungary.¹⁴ Reuters queries analysts quarterly about their ERM entry expectations for Poland and the Czech Republic and monthly about their expectations for Hungary, i.e. after the monthly releases of most of the macro indexes. If analysts' expectations are mainly based on the newest macrodata, their expectations are unlikely to change between two monthly Reuters polls. Therefore, expectations of ERM II entry dates reported on the monthly polling days are assumed to be formed on those very days. And the monthly observations are simply interpolated on T of Hungary by translating them into daily constant data. The same interpolation is applied to the quarterly Reuters poll data for Poland and the Czech Republic.

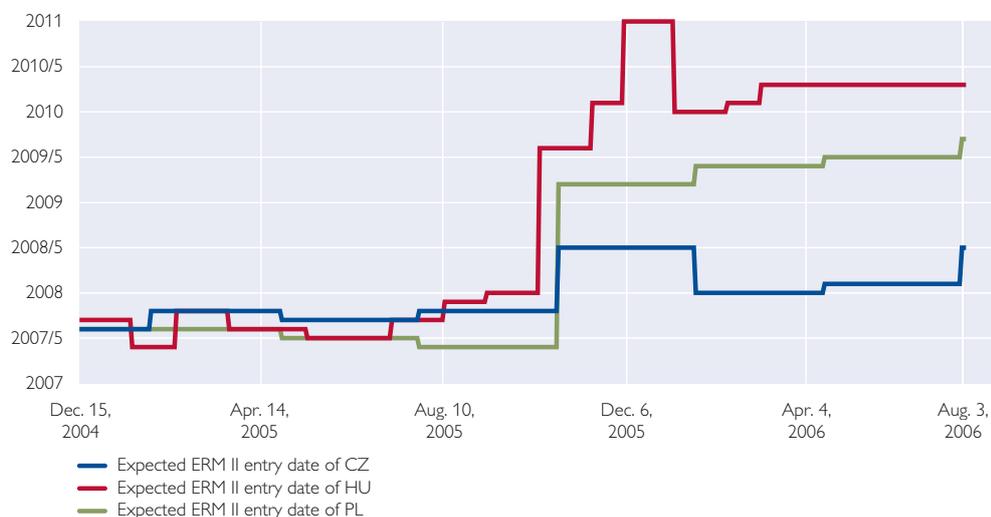
Chart 1 shows the average expected ERM II entry dates reported for the Czech Republic, Hungary and Poland in the period from December 15, 2004, to August 3, 2006. From this chart we can see that market expectations were relatively stable until the autumn of 2005 and subsequently changed between the quarterly polls of August and November for the Czech Republic and Poland, and between September and October 2005 for Hungary. Until the autumn of

¹³ The Estonian kroon, the Lithuanian lita and the Slovenian tolar joined ERM II on June 27, 2004. On May 2, 2005, three other EU Member States joined ERM II: Cyprus, Latvia and Malta.

¹⁴ In order to check the robustness of our results, I model the time of locking at the time of EMU entry in an alternative specification, in which the parameter of the time of locking is set equal to the average of the reported expectations of the individual analysts regarding the time of EMU entry. Since the results of the ERM II entry date specification do not differ qualitatively from those of the EMU entry date specification, only the former are presented here.

Chart 1

Average Expectation of Analysts about ERM II Entry Dates



Source: Reuters polls.

2005 the three countries had been expected to enter ERM II in the course of 2007. Thereafter, the expectations changed dramatically, as reflected by the monthly and quarterly Reuters polls, pointing to a postponement of ERM II entry to 2008 for the Czech Republic, to 2009 for Poland and to 2010 for Hungary.

For a given value of c , one can calibrate the initial values of the factors and the correlations. The estimation method for the parameter c will be discussed in detail at a later point. For now, let us assume that we know the parameter c and want to calibrate the parameters x_{t_0} , v_{t_0} , $\rho(dz_{T,t}, dz_{x,t})$, $\rho(dz_{T,t}, dz_{v,t})$ and $\rho(dz_{x,t}, dz_{v,t})$.

What makes these calibrations somewhat difficult is that no direct information on the latent exchange rate is available. For a given value of c (see below), the initial values of the factors and the correlations – in our case the parameters x_{t_0} , v_{t_0} , $\rho(dz_{T,t}, dz_{x,t})$, $\rho(dz_{T,t}, dz_{v,t})$ and $\rho(dz_{x,t}, dz_{v,t})$ – are calibrated as follows. For the calibration of the initial states, x_{t_0} and v_{t_0} and some time-invariant parameters, the Reuters polls are used. I assume that x_{t_0} is equal to the log of averaged expectations on the central parity reported by the last Reuters polls of 2004. The initial value of v_{t_0} is calculated by plugging s_{t_0} , c and T_{t_0} into equations (10).

One possibility to calibrate the correlations $\rho(dz_{T,t}, dz_{x,t})$, $\rho(dz_{T,t}, dz_{v,t})$ and $\rho(dz_{x,t}, dz_{v,t})$ is to use not only the end-2004 Reuters poll data but all averaged expected central parities reported by the polls. By following this strategy of calibration, first, the latent exchange rates corresponding to each of the monthly and quarterly observations need to be calculated, using again equations (10) and the corresponding observations of the historical exchange rate, of parameter c and the calibrated T_t . Then the calibrated correlations can be calculated from these monthly and quarterly data on x , v and T . This

strategy of calibration has the major drawback that only a few observations¹⁵ can be used to calculate the correlations. Moreover, by following this strategy one might obtain correlations with a sign that is not in line with the theoretical considerations¹⁶ presented in subsection 2.1. Indeed, six of the nine correlation parameters of the three countries have the wrong sign if their calibration is based on the above method. Consequently, I opt to simply set all nine correlations to 0.

The estimated c maximizes the filtering likelihood, which is obviously a function of the calibrated initial state parameters. Consequently, the sequence of estimation and calibration should be the following: First these parameters should be calibrated for all candidates of c . Then the filtering likelihood can be calculated for the set of calibrated parameters and the candidate for c . Finally, by searching for the optimal c , the estimated c parameter and the calibrated parameters depending on c are determined simultaneously.

It is difficult to estimate the volatility of market expectations regarding the time of locking for the following reasons. First, this volatility is likely to fluctuate substantially over time; second, as only a few observations on T are available to estimate the time-varying $\sigma_{T,t}$, I have to rely more on intuition than on the data. The instantaneous volatility $\sigma_{T,t}$ is assumed to be very large whenever market expectations for locking dates jump. However, $\sigma_{T,t}$ is assumed to be negligible¹⁷ whenever market expectations for the time of locking are unchanged. This assumption renders the system matrix A independent from the jumps in T .¹⁸ In contrast to the system matrix A , the system covariance matrix Q is still affected by the changes in T through its time-invariant correlations with the other factors.

For a given value of time-invariant parameters c and $\rho(dz_{x,t}, dz_{v,t})$ it is possible to estimate the time-varying volatilities of the factors v and x . Parameters $\sigma_{v,t}$ and $\sigma_{x,t}$ are estimated from six implied volatilities $\sigma_{t,i}^{imp}$ for every point in time t by ordinary least squares (OLS). The basic idea of the estimation is to minimize the distance between the theoretical option prices given by the option pricing formula (17) and the historical option prices. The six options have different maturities $m(i)$. In case of the Czech koruna and the Polish zloty the maturities are one month $m(1)$, two months $m(2)$, three months $m(3)$, six months $m(4)$, nine months $m(5)$ and one year $m(6)$, whereas in the case of the Hungarian forint the currency options have one-week $m(1)$, one-month $m(2)$, two-month $m(3)$, three-month $m(4)$, six-month $m(5)$ and one-year $m(6)$ maturities. The OLS estimates of $\sigma_{v,t}$ and $\sigma_{x,t}$ satisfy

¹⁵ The number of observations is 7 in case of the Czech Republic and Poland and it is 20 in case of Hungary.

¹⁶ Based on the theoretical considerations the correlations have to meet the following sign restrictions:
 $\rho(dz_{T,t}, dz_{x,t}) \geq 0$, $\rho(dz_{T,t}, dz_{v,t}) \geq 0$ and $\rho(dz_{x,t}, dz_{v,t}) \leq 0$.

¹⁷ Whenever $\sigma_{T,t}$ is negligible, the option pricing formula (17) is valid, because all the applied approximations of the derivation of (17) are justified.

¹⁸ An alternative assumption is that $\sigma_{T,t}$ is always finite and the A matrix is affected by the changes of T . The time-varying parameter $\sigma_{T,t}$ could be chosen so that the process of x is pulled back to its reported value in each month or quarter. This specification would be interesting only if the Reuters poll data on the expected central parity were more reliable and one aimed to filter x between every two Reuters polls.

$$\min_{\sigma_{v,t}, \sigma_{x,t}} \sum_{i=1}^6 \left[g(t, m(i), \sigma_{x,t}, \sigma_{v,t}, \rho(dz_{v,t}, dz_{x,t})) - \sigma_{t,i}^{*,imp} \right]^2. \quad (21)$$

The term $\sigma_{t,i}^{*,imp}$ of equation (21) is either the implied volatility $\sigma_{t,i}^{imp}$ or a transformation of it. The possible need for a transformation of the implied volatilities can be explained along the following lines. Obviously, if the option pricing model of section 3 were to perfectly capture the relationship between the volatility of the factors and the implied volatilities, then there would be no need for any transformation. Since the filtered factors are heavily dependent on their estimated volatilities, it is crucial to investigate what else can affect the implied volatilities apart from the volatilities of the factors. Moreover, if these other possible effects do not happen to be orthogonal to the volatilities of the factors in the option pricing formula, then we face the omitted-variable problem. Hence, the estimated volatilities of the factors will be biased.

One possibly omitted variable is the one that captures the effect of an implicit or explicit fluctuation band. Until this point, I have not taken into account that the fluctuation of the exchange rate of the Hungarian forint against the euro is limited by an exchange rate band. In addition, the Czech Republic and Poland might apply an implicit fluctuation band that can have significant but different effects on the historical option prices with different maturities. The closer the exchange rate is to the edges of the band, the more limited is its volatility.¹⁹ Moreover, the diminishing effect on the volatility is higher over longer periods. Consequently, option prices with longer maturities should be affected more heavily by the relative position of the exchange rate in the fluctuation band than by option prices with shorter maturities.

First, I transform the implied volatilities in order to purge the possible effect of an explicit or implicit band. When finding empirical evidence of significant effects of the band on the implied volatilities I use the transformed data to estimate $\sigma_{v,t}$ and $\sigma_{x,t}$ by (21); in the absence of evidence for the effect of a possible target zone on the volatilities, I use the untransformed implied volatility data to estimate $\sigma_{v,t}$ and $\sigma_{x,t}$.

The applied transformation is such that it does not effect the implied volatility of the option with the shortest maturity $\sigma_{t,1}^{imp}$. All the other implied volatilities are transformed to $\sigma_{t,i}^{*,imp} = \sigma_{t,i}^{imp} - \hat{\beta}_{i,0} - \hat{\beta}_{i,1}S_t - \hat{\beta}_{i,2}S_t^2$, where $\hat{\beta}_{i,\cdot}$ are the estimated parameters of the following regression.

$$\sigma_{t,i}^{imp} - \sigma_{t,1}^{imp} = \beta_{i,0} + \beta_{i,1}S_t + \beta_{i,2}S_t^2 + \varepsilon_{t,i}^{imp} \quad i \in \{2, 3, 4, 5, 6\}. \quad (22)$$

In this regression the volatility wedge, defined as $\sigma_{t,i}^{imp} - \sigma_{t,1}^{imp}$, is regressed on a constant and on the exchange rate and on its square.

Table 1 shows the common explanatory power of the constant, the exchange rate and the square of exchange rate for the five volatility wedges and for the three countries. As we can see, the R^2 values are only high for Hungary. This can be interpreted as finding evidence for the effect of the target zone on the

¹⁹ This finding is supported by the theoretical models on target zones e.g. by Krugman (1991) and Naszódi (2004).

Table 1

R² of the Estimated Equation (22) –

Volatility wedge variations explained by a constant, the rate exchange and its square in %

	CZ	HU	PL
i=2	14.24	13.89	15.95
i=3	13.70	29.83	12.81
i=4	18.15	36.77	12.73
i=5	23.55	41.45	11.54
i=6	21.08	43.60	9.91

Source: Author's calculations.
Note: *i* indexes the options with different maturities.

volatility wedges, on the differences between the option prices with different maturities. In contrast, in the case of the Czech Republic and Poland, the exchange rate does not explain much of the variance of the volatility wedges. Consequently, the implied volatility data need to be transformed for Hungary before estimating $\sigma_{v,t}$ and $\sigma_{x,t}$ but not for the other two countries.

Table 2

Estimated *c* Parameter and Corresponding *t* Statistics¹

	CZ	HU	PL
<i>c</i>	1.80	2.05	2.365
(tstat)	(8.92)	(8.90)	(8.08)

Source: Author's calculations.
¹ The *t* statistics are calculated from the asymptotic covariance matrix estimated by the BHHH algorithm.

By estimating (21) we obtain the time-varying volatilities of the factors. Chart 2 shows the time series of the estimated volatilities of the factors. The estimated volatility of *x* is often 0, but may jump to between 10% and 30% or even beyond during turbulent times. In Hungary, for instance, the estimated volatility of *x* soared to around 70% in July 2006. The high

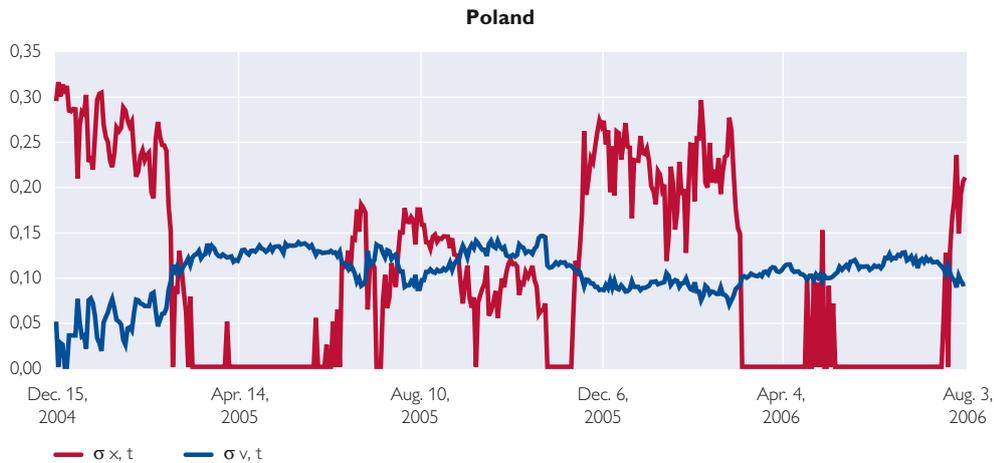
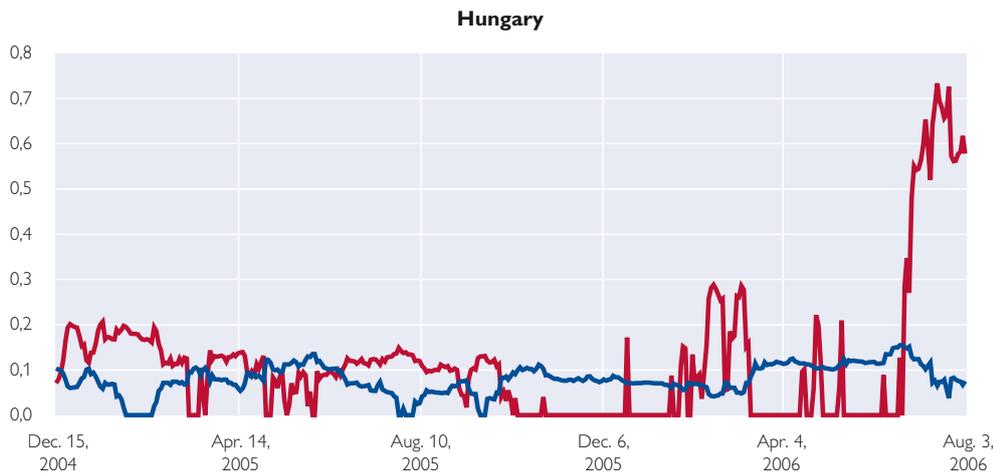
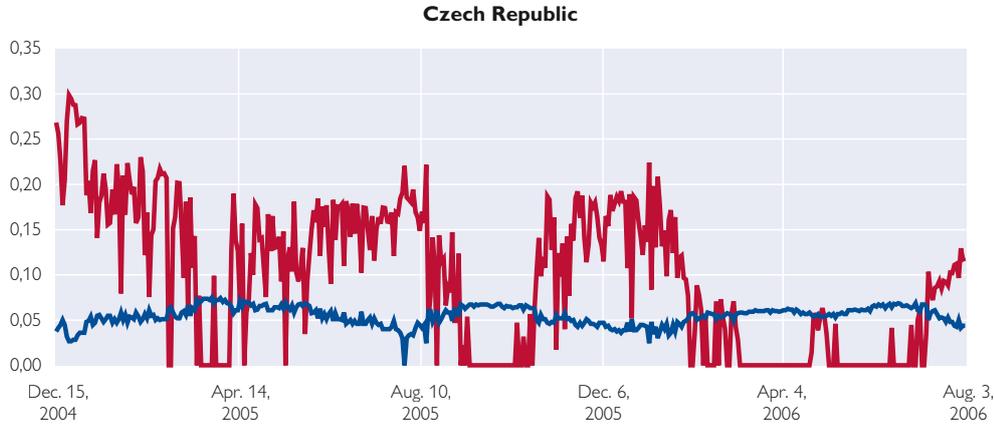
estimated volatilities of *x* can, incidentally, be associated with those times when the long implied volatility substantially exceeds the short implied volatility.

The estimates for *c* are around 2 for all three countries: 1.80 (Czech Republic), 2.05 (Hungary) and 2.365 (Poland). Table 2 shows that these parameter estimates are highly significant. One can interpret a parameter value of around 2 as follows. If a country will lock its exchange rate to the euro in four years, then the elasticity of the exchange rate with respect to market expectations for the final conversion rate ($e^{-\frac{T-t}{c}} = e^{-\frac{4}{2}}$) is almost 14%. If locking is expected to occur in two years, then this elasticity or the relative weight of the log final conversion rate in the log exchange rate is more than 40%.

Chart 3 shows the relative weights of the expected log locking rate in the log exchange rate in the investigated period. Positive shocks in *T* decrease the relative weight of *x* whereas negative shocks increase it. The largest change in the relative weights took place after September 2005, when market expectations for the ERM II entry dates shifted substantially for all three countries. Yet the relative weight of *x* remained significant for all three countries. Even the smallest relative weight of *x* exceeded 10% in the case of the Czech Republic and Poland and 7% in the case of Hungary.

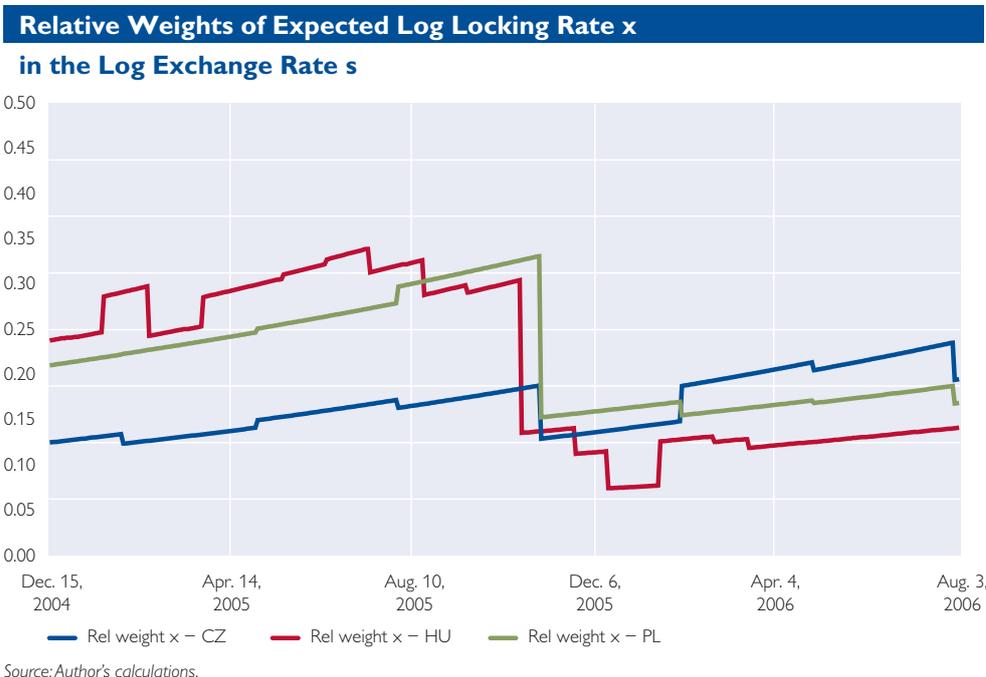
Chart 2

**Estimated Volatilities of Expected Locking Rate x
and Latent Exchange Rate v**



Source: Author's calculations.

Chart 3



4.3 Filtered Market Expectations

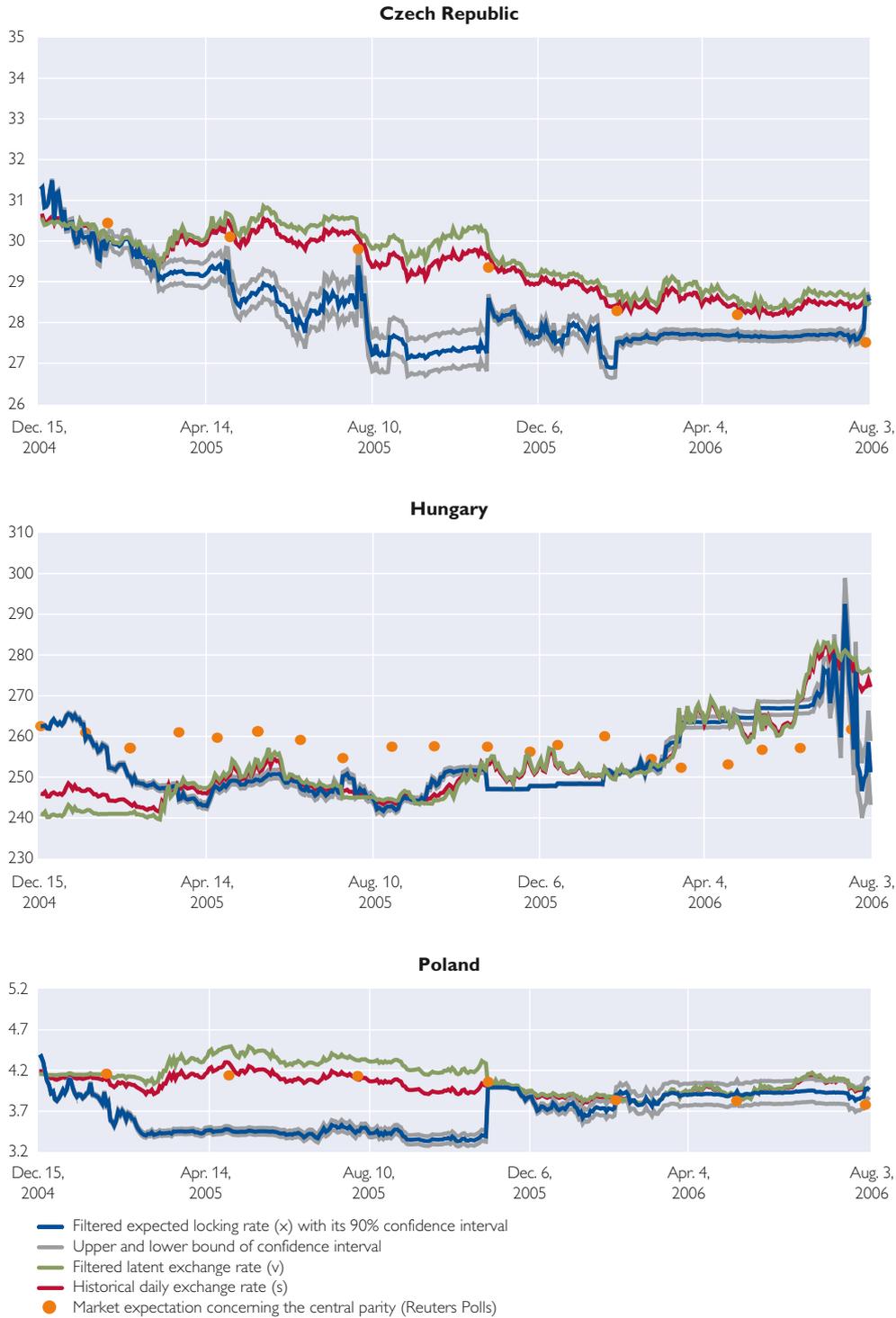
Chart 4 shows the historical exchange rates of the Czech koruna, the Hungarian forint and the Polish złoty against the euro, the filtered states and analysts' average expectations for the central parity as polled by Reuters. Market expectations about the final conversion rate may be thought to be close to the expected central parity of the ERM II regime. In that case, the expected central parity is a good reference for the filtered expected final conversion rate to be compared with. Here, we compare the filtered market expectations with the average expectations reported by the Reuters polls, although we think that the polls have only limited information content with respect to the central parity. After all, respondents' views on central ERM II parities vary a lot in each poll. There is at least 6% difference between the two extreme views of the analysts, with even differences of more than 20% being quite common. These differences indicate that uncertainty around the reported expectations is likely to be high; one needs to bear this in mind when taking the average reported expectations as the general view of the market on central parity.

As is evident from chart 4, the patterns of the filtered expected final conversion rate and of the reported expected central parity are similar for all three countries. Moreover, each pattern is similar to that of the corresponding historical exchange rate. However, the reported market expectations and the filtered x_t values differ significantly most of the time. The reported expectations of the market are usually outside the 90% confidence interval of the filtered x for all three countries.

We have important findings on both the level of the expected final conversion rate and on its volatility. If our previous view on the role of locking was based purely on the Reuters poll data on the averaged market expectations for central parities, then these new findings may modify our view in some aspects.

Chart 4

Filtered Market Expectations Regarding the Final Conversion Rate



Source: Author's calculations.

The filtered market expectations for euro locking rates are below the averaged market expectations for central parity for a long period for all three countries. In the case of the Czech Republic, the filtered expected locking rate is almost always lower than the reported averaged expectations regarding central parity. The only exception is the most recent observation of August 2006. The same holds for Hungary and Poland for their first subperiods. The filtered expected locking rate is smaller than the reported averaged expectations regarding central parity in Hungary until March 2006 and for Poland before October 2005. If one considers the filtered data to be more reliable than the Reuters poll data, then this paper contributes substantially to our knowledge on market expectations: In the first part of the investigated period the market expected the Czech koruna, the Hungarian forint and the Polish zloty to be locked at a stronger final conversion rate than suggested by the Reuters polls. In the case of the Czech koruna and the Polish zloty, the difference between the filtered market expectations and the reported averaged expectations regarding the central parity decreased substantially in the second part of the sample. As for the Hungarian forint, the market expected an even higher final conversion rate than suggested by the Reuters polls in the second part of the sample. Finally, at the end of the sample the two seem to coincide for the Hungarian forint as well.

The volatility levels of market expectations for the final conversion rate are important, because relatively stable market expectations can stabilize the exchange rate. The locking rate is often referred to as the nominal anchor of the exchange rate that can stabilize the exchange rate through the expectation channel. Regarding the volatilities, one can see that the filtered x is more volatile than the reported averaged expectations regarding central parity in all three countries. This finding might adversely modify our previous view based purely on the Reuters polls regarding the stabilizing feature of locking. Still, if the volatility of x is lower than that of s , then market expectations for the final conversion rate might have a stabilizing effect on the exchange rate. What can be seen from chart 4 is that most of the time the volatility of s exceeds the volatility of x in all three countries. In the Czech Republic and Poland locking seems to have had a stabilizing effect on the exchange rate from March 2006 until August 2006. Moreover, in Poland this appears to be true also for the period from March to October 2005. In those periods the volatility of market expectations for locking rates was almost always 0 (as shown in chart 3), and the filtered x values were more stable than the exchange rates. Moreover, the relative weights of x in the Czech koruna and Polish zloty were significant at

Table 3

Volatility of Exchange Rate s and

Latent Exchange Rate v in %

	CZ	HU	PL
σ_s	4.70	7.67	9.26
σ_v	5.02	8.26	11.98
$\sigma_s - \sigma_v$	-0.32	-0.59	-2.72
$(\sigma_s - \sigma_v) / \sigma_v$	-6.36	-7.15	-22.67

Source: Author's calculations.

around 20%. In the case of Hungary we can detect by visual inspection two periods characterized by the stabilizing effect of the prospect of locking, namely the periods from October 2005 to January 2006 and from March 2006 to June 2006. What might make the stabilizing feature of locking smaller in the case of Hungary as compared with the

other two countries is that the relative weight of x in s was only around 10% in these periods.

The big picture on the stabilizing feature of locking in the entire sample period is provided in table 3. The stabilizing effect of locking is calculated as the absolute and the relative difference between the volatilities of the historical and the latent exchange rates. Across the sample period, the stabilizing effect of locking is found to have been highest in Poland, second-highest in Hungary and least important in the Czech Republic. However, the Czech koruna would be the least volatile of the three currencies even if the Czech Republic were not aiming at joining the euro area.

5 Conclusions

This paper investigates market expectations for the final euro conversion rate of EMU candidate currencies based on a theoretical model for exchange rates subject to future locking. In this theoretical model, exchange rates subject to future locking converge to actual market expectations for the final conversion rate in the expected term; the nearer the (expected) time of locking, the higher is the speed of convergence. In the empirical part of the paper, the Kalman filter is used to extract the subjective expectation of market participants for the final conversion rate from historical exchange rate data for the Czech Republic, Hungary and Poland.

Our previous view on the role of locking, which was mainly based on Reuters poll data, has been modified in some aspects. First, the level of the filtered market expectations for the final conversion rate differs significantly from the averaged reported market expectations regarding the central parity in all three countries. Second, the stabilizing feature of market expectations for the final conversion rate on the exchange rate proved to be smaller in the case of filtered expectations than in the case of the averaged reported market expectations. The magnitude of the stabilizing effect depends on two determinants: the stability of market expectations for the locking rate and the importance of expectations in determining the exchange rate. In case of an earlier entry to the euro area, the stabilizing effect is likely to be more substantial because market expectations for the locking rate are likely to be more stable. Moreover, the relative weight of the expectations in the exchange rate is also higher. Based on this intuitive argument, the prospect of locking should contribute most to the stabilization of the Czech koruna and least to that of the Hungarian forint. Yet the results somewhat contradict this intuitive approach. Based on the investigation of the entire sample period, the stabilizing effect of locking is found to be highest in Poland, second-highest in Hungary and least important in the Czech Republic. However, the Czech koruna would be the least volatile of the three currencies even if the Czech Republic were not aiming at joining the euro area.

This paper presents the result of a work in progress. Future research will be directed at estimating the expected locking dates from interest rate data and estimating the correlation parameters instead of fixing them to 0. These modifications will hopefully cope with some of the counter-intuitive results that can be found in the current version.

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Predicting Currency Crises Using the Term Structure of Relative Interest Rates: Case Studies of the Czech Republic and Russia

Among the plethora of early warning mechanisms for currency crises proposed in the literature, there is an approach which has received little attention so far. This rather simple early warning indicator relies on the term structure of relative interest rates, unlike the vast majority of such systems that are based on macroeconomic fundamentals to predict a crisis in a long- or medium-term horizon. It measures changes in market sentiment regarding the relative probability of a currency crisis to estimate the timing of a crisis within a very short time window. This indicator thus complements long-horizon models that have been widely used so far. We apply this method to currency crises in the Czech Republic in 1997 and in Russia in 1998 and find evidence that the indicator would have performed well as a real-time predictor in both episodes of currency distress.

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1 Introduction

The last two decades have witnessed several and massive currency crises and speculative attacks. This is why researchers, politicians and central bankers have redoubled their efforts to better understand these dramatic events, which tend to be painful and costly shocks for the economy in question and usually also affect the population immediately, e.g. in the form of a massive contraction of GDP or growing poverty. Increasingly globalized capital markets imply growing volumes of and diminishing barriers to capital flows, principally reducing the potential risk of a sudden stop in capital inflows (see e.g. Goldstein, 2005, Roubini, 2006, and International Monetary Fund – IMF, 2006). Notwithstanding the relative tranquility of the past few years, there are certain countries whose fundamental macroeconomic and/or political conditions economists and politicians generally deem to be vulnerable to a balance-of-payments crisis. This holds particularly true for some emerging economies in Central and Eastern Europe (CEE), a key focus of this publication.

In both the theoretical and empirical literature, researchers have therefore paid attention to the phenomenon of currency crises. In the realm of theory, the so-called first generation model failed to provide satisfactory theoretical instruments to describe and explain the causes and frequency of crises in the 1990s, which led to the creation of the second and third generation of currency crisis models. Moreover, as some of the financial crises (e.g. in Mexico 1994 or in Asia 1997) took the international community rather by surprise, economists also started pondering ways to predict the timing of such events. Within just a few years, distinct forecasting models emerged with fair to middling predictive accuracy.

Among the abundance of models, one approach has received little attention so far. Unlike the vast majority of other early warning systems, this rather simple indicator does not rely on macroeconomic fundamentals to predict a

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crisis in a long- or medium-term horizon. Instead, it uses the term structure of relative interest rates to obtain estimates of changes in market participants' perception of the timing of a currency crisis in a very short time window. To our knowledge, only a handful of researchers have so far followed this approach, which is essentially based on the seminal work by Collins (1984).

The available evidence suggests a reasonable predictive power of the indicator. Compared with other models, this approach has several attractive advantages. First of all, it does not require a definition of what constitutes a crisis in terms of percentage depreciation, which tends to be rather arbitrary in the literature. Based on term structure data alone, this approach does not rely on estimating threshold values of fundamental variables (for a group of countries), but extracts expectations regarding the timing of a crisis from country-specific interest rates. Moreover, as this approach requires the use of country-specific data only (which are usually easily available), no pooling is necessary to obtain a sample of usable size. Most importantly, this indicator complements widely employed long-horizon models based on fundamentals, as it mirrors the very short-term sentiment on foreign exchange markets and thus focuses on predicting the imminent outbreak of a crisis.

Existing attempts to use early warning mechanisms in crises in emerging CEE economies have suggested that the predictive power of these models is rather poor, particularly out of sample. This may be attributable to too long forecasting horizons on the one hand and to limited data availability, especially in the early transition periods, on the other. Hence, the general advantages of the term-structure indicator sketched above are even more pronounced in this restricted environment. In this paper we would therefore like to complement the still rather patchy research by testing the term-structure indicator on crises in CEE. The general perception on currency crises in CEE during transition is concentrated on three events: Bulgaria in January 1997, the Czech Republic in May 1997 and Russia in August 1998.³ As not even the basic data required for our indicator were available for the precrisis period in Bulgaria, we focus on the two other countries in this study.

The paper is structured as follows. In section 2 we give a brief overview of the theoretical and empirical literature on currency crises and early warning systems as well as their performance in CEE. In section 3 we develop the model framework for the indicator. In section 4 we provide empirical evidence of the indicator's performance as a real-time predictor prior to the crises in the Czech Republic in 1997 and in Russia in 1998. A detailed explanation of the reasons for the crises would go beyond the scope of this paper. However, we put the indicator in context by describing its performance against the background of the crises' most relevant milestones, and thus also briefly describe their evolution. Finally, section 5 concludes.

³ Depending on the definition of a crisis, some authors may interpret more episodes of currency weaknesses as crises.

2 Brief Review of the Currency Crisis Literature

2.1 Theoretical Literature

Although this paper focuses on empirical early warning mechanisms for currency crises, we will also briefly look into the theoretical literature, as it set the stage for the (much younger) empirical models. The literature on currency and balance-of-payments crises looks back on a relatively long history. Its theoretical foundations were laid in the seminal work by Krugman (1979). In this paper and in others of the so-called first generation model (see e.g. Flood and Garber, 1984), speculative runs on currencies are explained by adverse developments of fundamental macroeconomic variables (particularly excessive fiscal and monetary expansion) that are incompatible with the sustainability of the fixed exchange rate arrangement. In Krugman's model, the monetization of fiscal deficits would eventually lead to a complete depletion of the central bank's foreign reserves, so that the bank would have to abandon the fixed exchange rate regime. However, as speculators anticipate this inevitable collapse, they lose confidence and start selling off domestic currency as soon as reserves drop to a certain level at which there are no longer any arbitrage opportunities. By selling currency, they accelerate the exhaustion of reserves and the ensuing devaluation of the exchange rate. According to first generation models, crises are thus homemade consequences of inadequate economic policy, and the outbreak of a crisis is entirely predictable.

As this theoretical approach was not really satisfactory in describing and explaining a series of speculative attacks in the European exchange rate mechanism (ERM) and in Mexico in the first half of the 1990s, when no critical development of macroeconomic fundamentals could be observed, a second generation of currency crises models emerged. These models, pioneered by Obstfeld (1994), describe crises as the consequence of self-fulfilling expectations of markets that are characterized by multiple equilibria. A speculative attack is regarded as a self-directed shift from one rational expectations equilibrium in which a fixed exchange rate regime is sustainable to another equilibrium in which it is not. The government abandons its exchange rate policy as soon as the costs that arise from maintaining the fixed regime exceed the total costs that stem from pursuing a floating regime on the one hand and from harmed credibility on the other. Obviously, the more the market is convinced that a central bank's resistance will eventually fail, the more expensive it becomes to defend a parity. The models of the second generation do not exactly specify how the switch from one equilibrium to another is initiated. The triggering factors might be, for instance, adverse political events, such as the outcome of the Danish referendum on the Maastricht Treaty in 1992, or a currency crisis in a neighboring country.

The third generation of models was developed when the existing approaches failed to provide a satisfactory explanation for the wave of currency crises in Asia in 1997. Krugman (1998), who was again one of the leading thinkers, came up with the idea of overinvestment. He explains the outbreak of a currency run as a symptom of, rather than the cause for, accumulated problems in the banking and financial sector. In concrete terms, the government issues implicit or explicit bailout guarantees to attract foreign banks and investment. Yet by guaranteeing bailouts for potential losses without improving and

reinforcing regulation and control of the financial system, a moral hazard problem arises, and overinvestment occurs. Excessively risky credits that are issued by financial intermediaries and backed by government guarantees drive up asset prices. This leads to a bubble on the asset market that will eventually burst and thus fully reveal the insolvency of financial institutions. In contrast, Radelet and Sachs (1998) maintain that the shift from a “good” to a “bad” equilibrium was attributable to a combination of three factors: (1) a panic reaction on the part of the international investment community, (2) policy mistakes at the onset of the crisis by Asian governments, and (3) poorly designed international rescue programs that turned the withdrawal of foreign capital into a full-fledged financial panic. Dooley (2000) in a way links both approaches, arguing that a crisis will break out once a government’s (limited) capacity for bailouts is exhausted.

2.2 The Empirical Literature on Currency Crises

The theoretical literature we have sketched so far aims at providing explanations for runs on currencies in afflicted countries. Babic and Zigman (2001) point out that more than ten crises since 1980 whose costs amounted to at least 10% of GDP have occurred since 1980. Given the strong impact and proliferation of financial crises over the last two decades,⁴ researchers and policymakers have taken a strong interest in developing a mechanism for the early identification (and thus more likely prevention) of an approaching crisis. The first attempts to measure an economy’s external vulnerability and the extent to which it is prone to crisis were made in the aftermath of the Tequila crisis in Mexico in 1994. The pioneering work on quantitative early warning systems for currency crises was the canonical indicator approach developed by Kaminsky, Lizondo and Reinhart (KLR) in a series of papers (see e.g. Kaminsky, Lizondo and Reinhart, 1998). The KLR approach is based on monitoring the evolution of a number of economic variables or indicators. The authors tested a total of more than 100 indicators, which were clustered into six generalized categories: the external, financial and real sectors, public finances, and institutional and political variables. When a variable deviates from its “normal” level beyond a certain threshold value, this variable is said to issue a signal. The threshold is chosen so as to minimize the noise-to-signal ratio of the data available. Then a composite indicator is constructed as an average of indicators weighted by the frequency of correct predictions. Some of the variables that perform best in this framework are output, exports, the deviation of the real exchange rate from trend, equity prices and the ratio of broad money to foreign reserves. One of the major points of criticism of the KLR approach is the inclusion or exclusion of variables which are only loosely related to the theoretical literature (see Blejer, 1998). Another point is the loss of information for independent variables, as the amount by which a threshold is surpassed makes no difference (see Bussière and Fratscher, 2006).

Following the KLR approach, a great number of forecasting models has emerged both in the academic literature as well as in the private sector. Unlike the indicator approach, most of them are based on the results of logit or probit

⁴ For a survey on recent crises and conclusions drawn from them, see e.g. Dornbusch (2001) or Feldstein (2002).

regressions. It is noteworthy that these approaches, like the KLR model, tend to use as explanatory variables some fundamental data such as current account, exchange rate overvaluation or export growth data. The choice of variable is predominantly inspired by the three generations of theories on balance-of-payment crises, but tends to be limited by data availability. Whereas academic models usually use a long-term approach with forecasting horizons of up to two years, their private sector counterparts usually focus on a short time window of one to three months. Berg, Borensztein and Patillo (2005) give a very helpful overview of forecasting models which have either been directly implemented by the IMF or which have been developed by the private sector and have had their performance monitored by the IMF. Moreover, in their survey the authors address what may well be the most important question, namely whether early warning systems have any out-of-sample forecasting value added at all. In their assessment, they put a particular emphasis on the models' potential real-time performance. Unfortunately, their conclusions are rather disappointing: Only one of the long-horizon forecasts under consideration, the KLR model, provided better accuracy than pure guesswork and nonmodel-based predictions. The results for the other long-term models were not unambiguous, and the short-horizon private sector approaches performed rather poorly by and large. By contrast, when testing whether the KLR model would have been able to forecast the Thai crisis in 1997, Anzuini and Gandolfo (2003) conclude that the indicator approach has strong (ex post) explanatory power but quite limited predictive abilities.

Finally, several papers in the empirical literature employ Markov switching models to predict currency crises. In most cases, researchers only distinguish between two states (crisis or no crisis) and define two types of crisis regimes: one with a higher volatility (Abiad, 2003) and one with a higher mean (Cerra and Saxena, 2002). Chen (2005) introduced a third possibility in his model, defining an intermediate vulnerable state in addition to crisis and no crisis. This state is characterized by a higher mean than the whole sample but lower volatility than the high-volatility regime. He uses the Market Pressure Index (MPI) proposed in the KLR approach as the dependent variable, which reflects both the exchange rate and the change of foreign reserves. Chen shows that his approach is preferred to standard two-state models in six developing countries, in which the foreign exchange markets switched to either the vulnerable or the high-volatility regime prior to the crisis. In contrast, he finds that an alternative probit model does not issue any warning in three out of six cases. Moreover, in four of these six countries in question, the indicated probability falls as the crisis approaches. The Markov switching model thus outperforms the probit benchmark, particularly in the months immediately preceding the crisis.

Brüggemann and Linne (2002) were among the first to test an early warning mechanism on CEE data using the KLR methodology. Schardax (2002) studies the predictive power of macroeconomic fundamentals for crises in CEE using binary variable models after preselecting the variables by means of the signal approach. Bussière and Fratscher (2006) try to improve the forecasting abilities of binomial logit models by extending them to a multinomial model with three regimes of the dependent variable. In contrast, Kittelmann et al. (2006) apply the Markov switching approach put forward by Abiad

(2003) to economies in CEE and the Commonwealth of Independent States. Apart from the rather fair to moderate prediction results, particularly out of sample, all of these studies are characterized by a medium- to long-term forecasting horizon ranging between 12 and 24 months and the use of macroeconomic fundamentals as explanatory variables.

In contrast, only a handful of attempts have been made to use financial market information as a predictor of exchange rate developments. Malz (2000) investigates the predictive capacity of the implied volatilities of foreign exchange options, Cincibuch and Bouc (2001) do the same for the Czech koruna. In this paper, we propose an indicator which has enjoyed even less attention so far. It exploits the term structure of relative interest rates to estimate market participants' perception of the timing of a currency crisis in a very short time window. The seminal work on this method was done by Collins (1984), who applied her analysis to the March 1983 devaluation of the French franc relative to the Deutsche mark. The same approach was also used by Anzuini and Gandolfo (2003), who compare the predictive power of the fundamentals-driven indicator approach and of the term structure model for the crisis in Thailand in 1997. They conclude that the nonstructural approach used by Collins (1984) is well suited to forecasting, but does not provide an explanation of the events, while the opposite is true for the structural model. To our knowledge, the indicator has not been applied to CEE crises before and thus provides an innovative complement to the existing literature both in terms of methodology and the signaling horizon.

3 Using the Uncovered Interest Rate Parity to Predict Crises

The basic objective of our analysis is to examine the ability of foreign exchange markets to predict exceptional exchange rate devaluations. We rely on the model proposed by Collins (1984) to construct a leading indicator for currency crises (see also Anzuini and Gandolfo, 2003), which was designed to study the behavior of speculators prior to the French franc realignment in 1983. The indicator is anchored in the uncovered interest parity (UIP) and can be derived as follows.

Assuming perfect capital mobility, risk neutrality, a constant risk premium and arbitrage, the UIP can be written as follows

$$\frac{(1+i_{t,k})}{(1+i_{t,k}^*)} = \frac{E(e_{t+k} | \Omega_t)}{e_t} + \rho_{t,k} \quad (1)$$

where e_t is the spot exchange rate at time t , defined as the price of foreign currency in domestic currency units.⁵ $i_{t,k}$ and $i_{t,k}^*$ are the domestic and foreign interest rates at time t on deposits with maturity k . $E(e_{t+k} | \Omega_t)$ stands for the expected exchange rate in period $t+k$, given the information available at time t , and $\rho_{t,k}$ represents a premium for risks not immediately related to exchange rate movements (e.g. the country default risk) and is for the moment assumed to be constant. Equation (1) states that the relative yield on domestic deposits of a given maturity is equal to the expected exchange rate movement and a well-defined country risk premium. Equation (1) can be rewritten as

⁵ That is, an increase of e_t means a depreciation of the domestic currency.

$$E(e_{t+k} | \Omega_t) = \left[\frac{(1+i_{t,k})}{(1+i_{t,k}^*)} - \rho_{t,k} \right] e_t. \quad (2)$$

Let us assume that at time t , market agents form expectations on future exchange rate developments and assign a certain probability to the event that the exchange rate will remain stable. The complementary probability is assigned to the event of a crisis, meaning a one-time depreciation and a stable exchange rate afterwards.⁶ Formally, this implies that

$$E(e_{t+k} | \Omega_t) = (1 - \pi_{t,k})e_t + \pi_{t,k}z_{t,k} \quad (3)$$

where $z_{t,k}$ is the exchange rate in the period $t+k$ in the case of devaluation, $z_{t,k} = \gamma_{t,k}e_t$, where $\gamma_{t,k} > 1$, and $e_{t,k}$ is the expected exchange rate assuming no devaluation (in other words, the exchange rate remains stable at the level observed at time t). The subjective probability of devaluation occurring after k periods is therefore $\pi_{t,k}$. In line with Collins (1984), we assume that the rate of depreciation does not depend on the temporal horizon, so that $\gamma_{t,k} = \gamma_t$. It follows that the link between the relative yields and the subjective probability of devaluation can be stated as

$$\alpha_{t,k} = 1 + (\gamma_t - 1)\pi_{t,k} + \rho_{t,k}, \quad (4)$$

where $\alpha_{t,k} = (1+i_{t,k})/(1+i_{t,k}^*)$. The perceived probability of a devaluation between time t and $t+k$, $\pi_{t,k}$, can be written as $\pi_{t,k} = \sum_{i=1}^k r_{t,i}$, where $r_{t,i}$ is the probability of a devaluation happening between the periods $t+i-1$ and $t+i$, which refer to different deposit maturities. Assume that there are two maturities, $k=7$ and $k=30$ days (this will be the case in the empirical illustration in the following section). Then it can be easily shown that, assuming $\rho_{t,k} = 0$, that

$$r_{t,7} = \frac{\alpha_{t,7} - 1}{(\gamma_t - 1)}, \text{ and} \quad (5)$$

$$r_{t,30} = \frac{\alpha_{t,30} - \alpha_{t,7}}{(\gamma_t - 1)}. \quad (6)$$

The ratios (or log ratios) of the expressions above are independent of the assumed size of the devaluation, γ_t , and can thus be used to evaluate changes in the market participants' relative probabilistic assessment of crisis timing. Our basic indicator for the empirical analysis will be the log ratio of $r_{t,7}$ to $r_{t,30}$ ⁷

$$I_t = \ln \left(\frac{r_{t,7}}{r_{t,30}} \right) = \ln \left(\frac{\alpha_{t,7} - 1}{\alpha_{t,30} - \alpha_{t,7}} \right), \quad (7)$$

⁶ Constructing the indicator in this simplistic way rules out other possible expectations of the markets (e.g. expectations about developments of the exchange rate after the crisis, such as overshooting) which could otherwise (by different constructions) be reflected in the indicator's development. This construction also implies that the indicator cannot be interpreted in the same manner after the fixed exchange rate regime has been abandoned.

⁷ As explained before, the indicator is meant to mirror short-term market sentiment, since we believe that market instruments are able to provide information on the markets' expectation only in the very short horizon. Indeed, although the results are similar to some extent if a short maturity (e.g. 7 or 30 days) is related to a longer maturity (e.g. 90 days), according to our expectations the indicator performs best if the two shortest maturities are used.

so that increases in I_t imply an increase in the probability perceived by investors that a crisis will occur in the forthcoming week as compared to the crisis taking place in the period between day 8 and day 30.⁸

4 Applying the Model to Crises in CEE

In this section we will apply the indicator to data on two recent currency crises in CEE: the currency crisis in the Czech Republic in May 1997 and the one in Russia in 1998.⁹ In both cases we will describe the economic framework in which the currency crises took place and present the real-time estimates of our indicator for both economies in the crisis period. Please note that the indicator proposed in this study does not have the typical properties of most crisis indicators in the literature – it does not send a binary signal of the type “crisis” versus “no crisis.” This implies that the usual evaluation of crisis indicators in the light of type I and type II errors does not apply in our setting. Our indicator registers changes in investors’ sentiment about the timing of the crisis, which means it is able to identify the initial stages of speculative attacks that may or may not cause currency crises.

4.1 Czech Republic, 1997

This crisis materialized when the peg of the Czech koruna to a Deutsche mark (65%) and U.S. dollar (35%) currency basket was replaced with a managed float regime on May 26, 1997. The reasons for the crisis given in the literature are manifold: The trade balance in the Czech Republic (which had been systematically positive after the breakup of Czechoslovakia) turned negative in 1996, and economic growth slowed down at the same time. Horváth (1999) interprets the current account deficit in the Czech Republic as reflecting an insufficiency of private savings, which – coupled with the Czech banking sector’s institutional framework of that time – would make the deficit unsustainable. Furthermore, the real exchange rate appreciated persistently and continuously in the period from 1992 to 1997.¹⁰

Although trend appreciation is a common phenomenon in transition economies that can (at least partly) be explained by differential productivity increases, as outlined in the Balassa-Samuelson effect, Begg (1998) and Horváth (1999) argue that the real exchange rate dynamics nevertheless implied a loss of competitiveness of the Czech economy. The adverse macroeconomic conditions, together with an unstable political environment, led to a speculative attack on the koruna and to the consequent change in the exchange rate regime in May 1997.

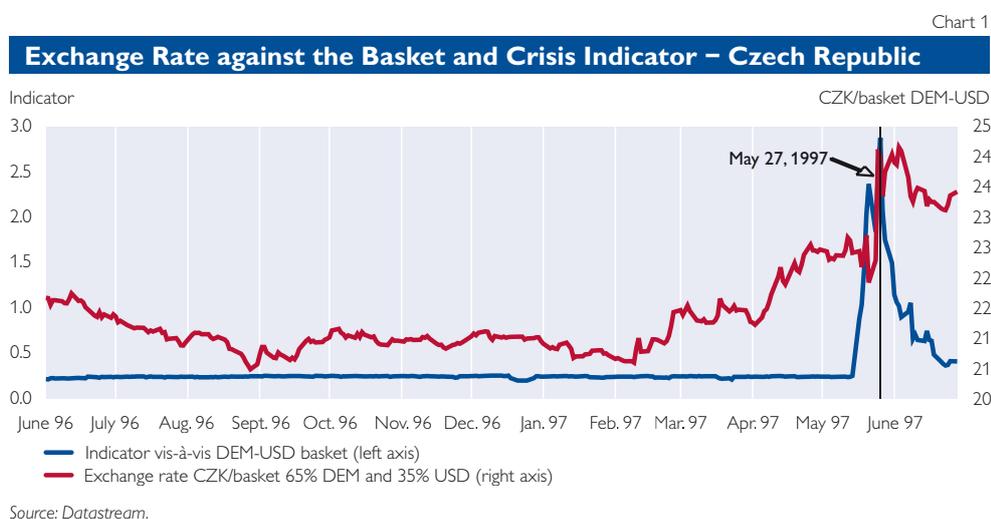
We calculated the indicator given by (7) for the Czech koruna against both the Deutsche mark and the U.S. dollar for the period from January 1, 1997, to the time when the peg was abandoned on May 27, 1997. We used the daily interbank rates with a maturity of one week ($i_{t,7}$ and $i^*_{t,7}$) and one month ($i_{t,30}$ and $i^*_{t,30}$) for the Czech Republic and, alternatively, for Germany and the

⁸ For an understanding of the need for logarithmic transformation, see Collins (1984).

⁹ Our choice of these two crises was exclusively based on data availability.

¹⁰ For an alternative description of the koruna exchange rate turbulence in 1997, see Šmídková (1998).

U.S.A.¹¹ Given the disinflationary trend for the period studied, the yield curve implied by the term structure of interbank rates in the Czech Republic slopes downward for most of the sample, thus leading to negative values in the argument of the log ratio corresponding to $r_{t,30}$, since $\alpha_{t,30}$ tends to be systematically smaller than $\alpha_{t,7}$ for the sample at hand. We redesigned the log ratio of probabilities by adding a constant to the numerator and denominator of the argument of the log. In the light of the uncovered interest rate parity theory, this can be reconciled with the existence of a certain maturity structure in the risk premium coupled with appreciation expectations.¹² In chart 1 we show the resulting indicator vis-à-vis the currency basket (the results are identical to those using Germany or the U.S.A. as the foreign economy),¹³ together with the exchange rate of the Czech koruna against the basket. It should be stressed that, as shown in chart 1, the exchange rate remained inside the $\pm 7.5\%$ band during the turmoil preceding the change in the exchange rate regime and depreciated strongly as soon as the managed float regime was in place. The fact that the monetary authorities were able to keep the koruna inside the fluctuation band was mainly ascribable to heavy central bank interventions in the week preceding the breakdown of the peg (see Horváth, 1999). Chart 2 presents the standardized changes in the indicator together with the 95% confidence interval for insignificant changes computed in real time using data back to January 1997.¹⁴



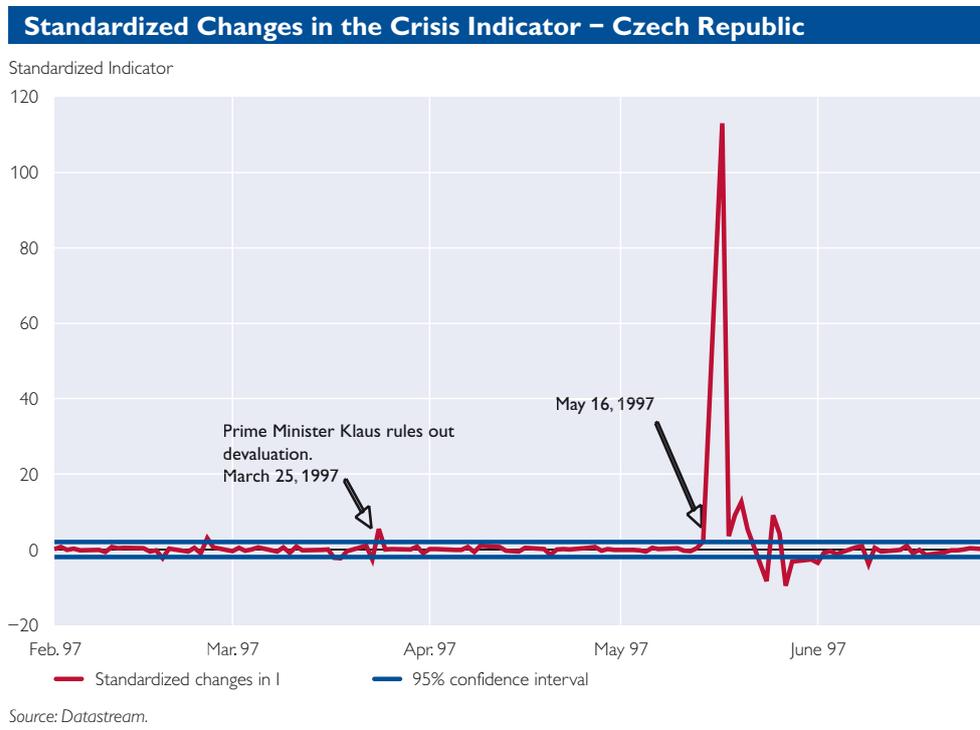
¹¹ All data were obtained from Datastream (Datastream codes: PRIBK1W, PRIBK1M, ECUSD1W, ECUSD1M, ECWGM1W, ECWGM1M, CZECHC\$, CZECHCM/DMARKER, RSUSDSP, ECUSD1W, RSIBK7D, ECUSD1M, RSIBK30).

¹² Admittedly, just adding a constant might appear fairly ad hoc here. Crespo Cuaresma and Slacik (2006) provide a more detailed justification for this approach as well as other methods for dealing with the negative term structure.

¹³ The results are also similar if the indicator is constructed under the assumption that seven days are not the shortest maturity available, which would change the calculation of the index.

¹⁴ The standardized indicator is defined as: $\frac{I(1) - \text{mean}(I(1))}{SD(I(1))}$, where $SD(I(1))$ stands for the standard deviation of the first difference of the indicator.

Chart 2



Changes in the level indicator can be interpreted as changes in the perceived probability of a crisis occurring in the following week as compared to a crisis happening in the period between day 8 and day 30. The indicator level in chart 1 remains practically constant from January to mid-May and starts increasing dramatically on May 16, reflecting a strong change in investors' perceptions on the potential timing of a devaluation.¹⁵ The increase is strong and sustained until May 28. After that, the indicator decreases slowly to a low level comparable with that of the precrisis period. However, chart 2 shows that apart from the ten-day window immediately prior to the crisis, the indicator issued a significant signal also on three days in the last week of March. March 25, the day on which the change in the indicator crosses the significance threshold, happens to coincide with the affirmation by Czech Prime Minister Klaus ruling out any devaluation on that day (see Horváth, 1999). Although the crisis broke out more than a month later and the signal thus has to be interpreted as a false one, this event suggests the beginning of mistrust in the markets.

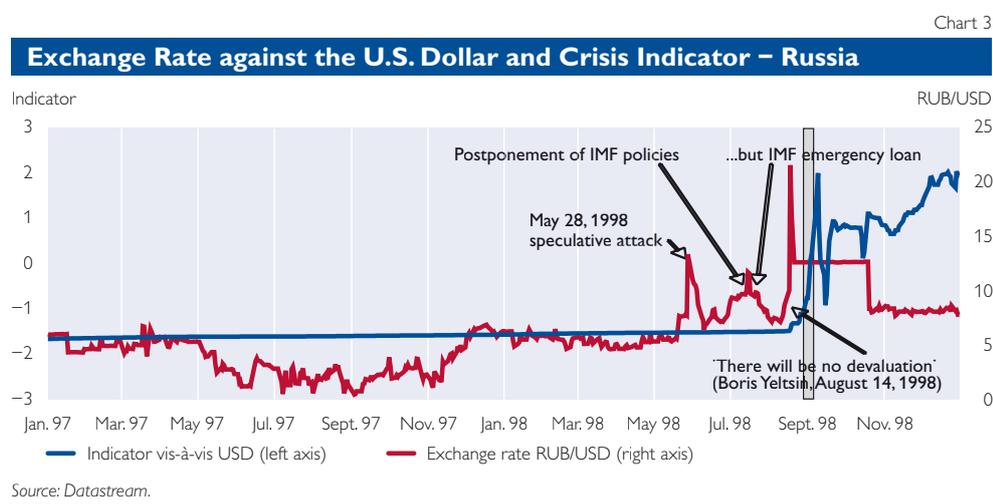
Overall, the indicator performs extraordinarily well as a (very) short-term crisis indicator. It could be used ex post for dating the de facto occurrence of the crisis (de jure, the date of a crisis usually corresponds to the moment in which the fixed exchange rate regime is abandoned).

¹⁵ Horváth (1999) mentions that the media discussion on devaluation strengthened from mid-April onward.

4.2 Russia, 1998

On August 17, 1998, after several months of financial instability, the Russian government announced a devaluation of the ruble against the U.S. dollar until the end of the year, defaulted on its government debt and declared a 90-day moratorium on foreign debt. On August 26, the Central Bank of Russia declared that the fixed exchange rate could not be supported any longer, and on September 2, 1998, the Russian ruble was floated.¹⁶

Using the corresponding interbank interest rate data for Russia and the U.S.A., we constructed the indicator for the dynamics of the relative probability of a crisis occurring within 7 days as compared to the interval between day 8 and day 30. Chart 3 presents the daily RUB/USD exchange rate together with the indicator I_t for the period from April to September 1998, adjusted to avoid negative probability values.



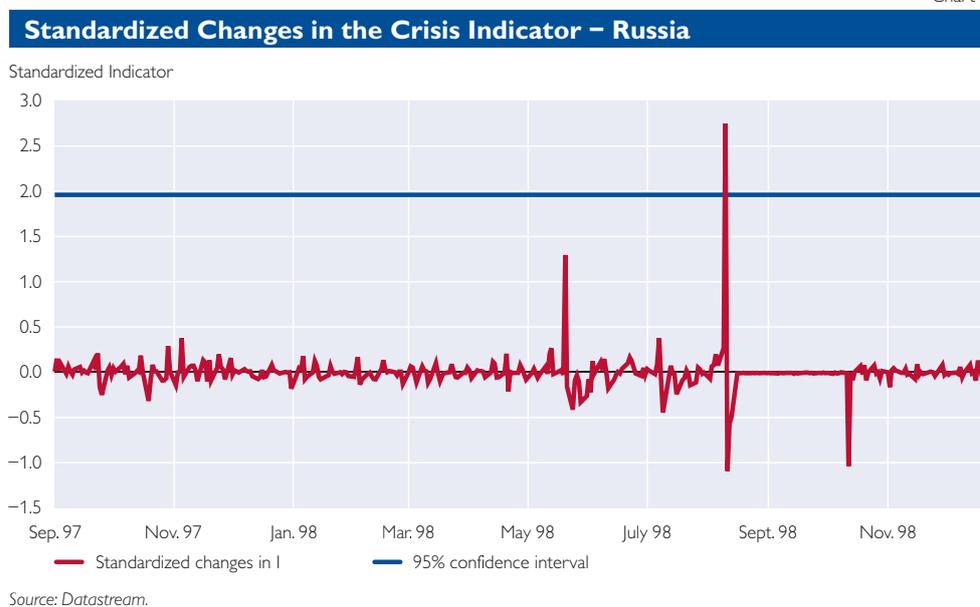
The first relevant feature of I_t is its positive trend in the period under study. This implies that investors systematically changed their expectations of the timing of an exchange rate crisis in the months preceding its actual occurrence: They tended to consider the crisis more imminent as it actually approached. Apart from this medium-term trend in I_t , the indicator shows relevant increases at end-May and mid-July as well as a global peak following the announcement of the devaluation (which preceded the change in the exchange rate regime by seven (working) days). The first peak took place on May 28, right after the Central Bank of Russia had increased the key interest rate to 150%. In the following days, the bank made several other interventions (using reserves to the tune of USD 1 billion) in a successful attempt to defend the ruble against speculative attacks (see e.g. Chiodo and Owyang, 2002). The indicator dropped in the following days and then resumed the positive trend that dominated the entire period.

The second signal that investors expected an imminent devaluation was registered at the beginning of July. It coincided with a decision by the Russian parliament to postpone the policy reforms needed to qualify for IMF loans.

¹⁶ For an excellent account of the Russian crisis, see Kharas et al. (2001).

The final approval of an IMF emergency loan to Russia in mid-July was given at the same time as investors' expectations of crisis timing shifted from the one-week period to the longer one. Finally, our indicator increased dramatically between August 10 and August 18, in parallel to the collapse of the stock and bond markets (on August 13) and in spite of Russian President Boris Yeltsin's affirmations that there would be no devaluation of the ruble after an emergency parliamentary session on August 14. Our indicator only stabilized on August 21, when the Russian crisis was already felt in the markets all around the world. Although the indicator peaked when the crisis was already felt, the increase in I_t was already strong up to seven days before the devaluation announcement. Chart 4 plots the standardized changes in the indicator, using data back to January 1997. As can be seen in the chart, the two increases in the indicator before the crisis do not represent significant crisis signals.

Chart 4



To sum it up, our indicator is able (1) to identify speculative pressures that were successfully combated by the Central Bank of Russia in the precrisis period, and (2) to signal the crisis six days before the official announcement of the devaluation.

5 Conclusions

Given that numerous and massive currency crises have occurred in recent years, researchers in both public and private institutions have stepped up their efforts to develop early warning systems. The vast majority of approaches uses similar macroeconomic variables to forecast the timing of financial distress with a rather long signaling horizon. Fundamental data are perfectly suited to identifying potentially vulnerable countries well in advance and, possibly, to explaining the crises ex post.

However, we believe that a forecasting tool that is oriented on market sentiment should have better predictive power, as it is the participants in the foreign exchange markets who eventually trigger a crisis. Investor sentiment

reacts much more strongly to short-term news and incoming signals than to the underlying long-term fundamentals. Along these lines, we employ a little-known early warning indicator based on a simple economic theory that uses the term structure of relative interest rates. It evaluates changes in market participants' perception of the relative probability of a crisis occurring in different time horizons. We applied the indicator to data on two of the most important recent currency crises in the Czech Republic, 1997, and Russia, 1998, and found that the indicator performs extraordinarily well as a (very) short-term crisis predictor in both cases.

Both case studies show that, even though the indicator may issue false alarms as in the Czech case or nonsignificant alarms as in the Russian case, signals from this indicator should always be taken seriously by central bankers and governments. Likening our indicator to a thermometer, a high body temperature does not necessarily imply a serious illness, but it is always a reason for vigilance. In that sense, our indicator is useful for economic policy institutions as an extra alarm bell that complements long-term oriented warning mechanisms.

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The Russian Nonfuel Sector: Signs of the Dutch Disease? Evidence from EU-25 Import Competition

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Simon-Erik Ollus^{2,3}

It is evident that the Russian economy is largely based on the energy sector. This fact has caused concern in academic circles as to whether Russia is to some degree affected by the Dutch disease, i.e. whether a sharp rise of commodity prices might result in an appreciation of the real exchange rate, which would undermine the competitiveness of manufacturing and could lead to the deindustrialization of the economy. We focus on this possible final outcome, which has not been studied much in the literature so far: We compare Russian industrial import growth (based on figures of the volume of EU-25 exports to Russia) with domestic industrial production growth (disaggregated by industries) in the period from 2002 to 2006. In all manufacturing sectors except electrical, electronic and optical equipment and strongly protected foodstuffs, Russian imports are found to be expanding faster than domestic output. In some sectors, imports have even exceeded domestic production. Import competition is therefore strong and rising. We conclude that Russia may be facing incipient deindustrialization at least in some parts of the manufacturing sector. This could indicate that the Russian economy has contracted the Dutch disease, although it should be noted that other factors could also have driven sectoral changes. While it is beyond the scope of our study to examine whether the other chain links of the Dutch disease hold as well, the study does provide evidence of some movements in the direction of deindustrialization, which is in line with the Dutch disease theory.

1 Introduction

Oil prices have risen very sharply and have attained high levels in recent years. This development has renewed interest in the Dutch disease hypothesis and in exploring its validity for oil-exporting countries like Russia. The core model of the Dutch disease hypothesis follows Corden and Neary (1982) and Corden (1984). It assumes that the economy consists of three sectors: Natural resources or resource tradable goods (simply referred to as “oil” in this contribution), non-resource tradable goods (“manufactured goods”) and nontradable goods (“services”).⁴ Windfall revenues resulting from an increase in oil prices have the initial effect of raising the aggregate incomes of factors employed in the oil

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⁴ Of course, these are not the only plausible references. For instance, in some countries/territories (Iceland, Greenland), fishing is the natural resource-based industry. Or, alternatively, in some Asian and African economies it is agriculture that can be squeezed by an increase in energy exports (Sachs and Warner, 1995; Bardt, 2005). Or, in particular circumstances, inflows of large amounts of foreign financial assistance might trigger deindustrialization (ICEG European Center, 2006). Furthermore, the above identifications, e.g. of nontradable goods as “services,” are admittedly not precise and somewhat outdated, as in the early 21st century, some services are actually more tradable than manufacturing goods, as they can be delivered via the Internet at virtually no cost – and under high competition. We continue to use the above terms, however, because they still seem to be largely correct and because they provide readers with concrete references that mean something to them.

sector. According to the model, this may give rise to a *resource movement effect* and to a *spending effect*.

The resource movement effect is brought about by a rise of wages in the oil sector, which induces a movement of labor out of manufacturing and nontradables (direct deindustrialization). The spending effect involves higher oil sector revenues, which raise aggregate demand, thus pushing up the price of services and fanning inflation. This implies an *appreciation of the real exchange rate*. Upward wage pressure throughout the economy erodes manufacturing competitiveness and forces a downsizing of the non-resource tradable sector (indirect deindustrialization). Moreover, the crowding out of manufacturing sets the stage for “unbalanced growth” which may be highly exposed to resource (oil) price and supply volatility and may therefore result in macroeconomic instability, stop-and-go investment activity, boom-bust cycles and overall sluggish long-term growth (Égert and Leonard, 2006). Once manufacturing is forfeited, growth tends to slow down because positive externalities from manufacturing in the form of faster technological progress are lost and production shifts away from activities that facilitate learning by doing (Kronenberg, 2004).

So far, there has not been much research on Russia and the Dutch disease. The reasons seem to be the short observation period for this transition country, difficult access to reliable data, frequent revisions of time series, and the fact that the most recent oil boom that could serve as a basis for measuring possible Dutch disease effects only started in 1999–2000. However, notwithstanding intermittent drops, this oil boom has continued until at least the fall of 2006, which is unusually long in the light of the experience related to oil cycles in the past decades. Moreover, Russia is one of the world’s primary producers of oil and gas. The share of oil and gas industries in Russia’s total GDP comes to about one-fourth, and the share of these two industries in the country’s total export revenues has reached nearly two-thirds.

Most studies so far have found that while Russia exhibits some of the symptoms of the disease, it has not (yet) caught the full-fledged malady. Åslund (2005) stresses the fact that average wages rose by over 30% annually in U.S. dollar terms from 1999 to 2005. His assessment concludes that many manufacturing branches cannot develop too favorably with such a leap in labor costs. Latsis (2005) goes one step further, maintaining that Russia’s currency is appreciating because of the huge inflows of export proceeds. In his view, the booming oil sector is strangling the country’s manufacturing industries and he therefore concludes that “the Dutch disease is already here.”

In contrast, in a study measuring U.S. dollar wages and comparing production growth, export shares and import penetration, Westin (2005) finds no compelling sign of a decline in manufacturing. From a trade perspective, the growth of Russian exports of consumer-related and high-tech commodities worldwide and to the EU did not generally suffer in the period from 1997 to 2001. However, the Russian market shares in exports of these product categories to the EU slightly declined during this time. Import penetration ratios are calculated for a very small group of 11 products (mostly belonging to machinery and equipment) where, according to Westin, production statistics reliably tally with customs statistics. Regarding this very

narrow sample, import penetration has progressed at a slower pace than the economy as a whole in the period from 1997 to 2003.

Roland (2005) likewise finds it premature to speak of the Dutch disease in Russia. The ruble has no doubt been appreciating in real terms, but this does not seem to have compromised manufactured goods' competitiveness. Between 2002 and 2004, the increase of Russian exports of iron, steel and manufactures outstripped that of fuels and mining. According to Ahrend (2005), real ruble appreciation in the period from 1999 to 2004 was matched by stepped-up industrial restructuring efforts that led to significant labor productivity adjustments in the large majority of non-resource tradable sectors. Much of the improved competitiveness has been attained by "passive restructuring" (labor shedding etc.). Real ruble appreciation as well as some other Dutch disease symptoms (e.g. the value added of some nontradables, namely trade and agriculture, growing faster than industry) are confirmed for the period from 1999 to 2004 by Égert (2005).

Based on sectoral and time series analyses covering the period from 1997 to 2004, Oomes and Kalcheva (2007) agree that high oil price-related windfall revenues in Russia have set the real exchange rate on an appreciation path that threatens the manufacturing sector's competitiveness. However, the resource movement effect is unlikely to play a significant role in Russia, given that the oil sector employs relatively few workers and that labor mobility is generally low. The spending effect seems to be more important. Consistent with the Balassa-Samuelson hypothesis, appreciation has been largely proportional to productivity differential growth. Oomes and Kalcheva conclude that what likely helped stall the Dutch disease thus far is Russia's prudent policy of saving its oil windfall revenues in the Stabilization Fund and swiftly redeeming its foreign debt.

Analyzing data up to 2005 and comparing manufacturing sector growth with that of energy extraction and with total GDP growth, Beck, Kamps and Mileva (2007) only find mixed evidence on manufacturing sector decline in Russia. Moreover, they find that evidence on labor shifting from manufacturing to services and mining is not conclusive.

While according to most studies, the Dutch disease does not appear imminent in Russia – or more precisely, did not appear imminent at the time of writing – they do seem to maintain that the long-term threat of an outbreak remains real. There are unambiguous signs of a real appreciation of the ruble and of this real appreciation being at least partly triggered by oil price rises and foreign currency inflows (see also chart 1). But the majority of studies does not (yet) see any clear adverse effects on Russian manufacturing.

In this light we propose to add a specific contribution to the research and discussion of (the possible existence of) the Dutch disease in Russia. However, we will not attempt to verify the functioning of all (hypothetical) chain links of the Dutch disease. Our focus will be exclusively on the final stage, i.e. on whether some degree of deindustrialization or a loss of manufacturing competitiveness has happened or is happening. We are aware that a loss of industrial competitiveness itself does not necessarily have to be triggered by the Dutch disease. Hence, any conclusions with respect to the existence or

Chart 1

Real Effective Exchange Rate of the Russian Ruble and Oil Price (1995–2006)



Source: MinEcon.

nonexistence of the Dutch disease need not be absolutely compelling in our case.

Looking at the last link of the Dutch disease, we will focus on external competitiveness. A decrease in exports can be triggered by real appreciation, which may, in turn, be attributable to nominal appreciation or to unit labor cost increases. This point should be taken up in future research. Imports can also provide valuable information on the competitiveness of domestic industries, which may be crowded out by imports, given the effects of real appreciation, which is triggered either by nominal appreciation or by labor cost increases. In this study, we will concentrate on import competition, which in fact has not yet been analyzed in depth in the empirical literature on Russia. Does import growth outstrip domestic production growth in the nonfuel sector? And if it does, what size have imports attained compared with domestic output? We will analyze these questions on an industry-by-industry basis for the entire range of goods.⁵

While this approach is promising, some qualifications must be noted with regard to import penetration being a useful indicator of the competitiveness of domestic industry. High import content in final domestic goods could mitigate this fact, especially if intermediate goods are classified differently than final goods. Higher imports do not necessarily compete with domestic goods if domestic goods are of low quality and imports are luxury goods. Furthermore, imports could have a positive impact on Russia's productive capacity and thus stimulate investment, exports and growth in the longer term. Finally, although we exclude exports from our comparison, the case is still strong, as about four-fifths of Russia's exports are clearly natural resources, and manufactured

⁵ We focus on manufacturing and do not include competitive market-oriented services (see footnote 1), given the lack of comparable data in the latter field.

goods account for only a tiny share of exports. Russia's market share in mature Western market economies' imports of manufactured goods is tiny. In the EU-25 market, for example, Russia's share of manufactured goods imports only comes to a few percentage points of total imports. Therefore, speaking of Russian export competition in this context would not be very meaningful.

The rest of this study is organized as follows. Section 2 is devoted to statistical issues and highlights the logic behind, and limitations to, our approach. Section 3 investigates whether Russia shows symptoms of the Dutch disease, based on the import competition approach. Section 4 draws overall conclusions.

2 Statistical Limitations

Instead of concentrating on import penetration like Westin (2005), we focus on growth rates in our approach. If imports in nonfuel sectors are found to have reached a substantial size and grow faster than domestic production, Russia would face some degree of the Dutch disease – otherwise not. Before proceeding to a detailed analysis of relevant data, some statistical limitations need to be discussed.⁶

The first problem we have to tackle is the lack of proper volume-based indices for Russian imports (and exports). The import figures reported by the Federal Customs Service of the Russian Federation are only available in nominal terms for international trade of goods classifications (Harmonized System,⁷ two-digit level), while for 95 specific commodities only detailed volume figures are available, but no data aggregated by subgroups in any Harmonized System (HS) classification. Hence, we lack coherent official data on Russian foreign trade volumes.

The second problem related to trade figures is that the Federal Customs Service's figures tend to undervalue Russian foreign trade, and especially imports. This is true particularly in categories with high value-added commodities, textiles and footwear. For EU-25 exports to Russia, for example, the recorded value of 2005 exports was on average nearly 40% higher than the corresponding figure the Federal Customs Service reported for imports. Such discrepancies are partly connected to different ways of recording re-exports in trade with Russia. Moreover, personal imports and shadow economy activities are another reason for the gaps between partner countries' registered exports to Russia and Russia's registered imports. The Central Bank of the Russian Federation (CBR) includes a special estimate of this deviation factor in its balance of payments figures. It came to 22% of total imports in 2005.

It is normal, however, that partner countries' trade statistics deviate to some degree, as there usually are differences in methodologies, exchange rates and accounting periods. Some countries also use secret categories for strategic goods, which makes comparisons more difficult. Figures reported by the

⁶ For more details, see Ollus and Barisitz, 2007.

⁷ The Harmonized Commodity Description and Coding System, better known as the Harmonized System (HS) is a nomenclature developed by the World Customs Organization and covering two-digit to ten-digit levels. The EU's Combined Nomenclature (CN) classification corresponds to the HS up to the six-digit level. The Federal Customs Service's "Tovarnaya nomenklatura vneshe-ekonomicheskoy deyatelnosti" (TN VED) methodology also corresponds to the HS up to the six-digit level.

Federal Customs Service differ from partner countries' statistics particularly for value-added goods, which are also important in our comparison of import competition. Moreover, as there are no detailed data in volume terms or import prices for whole categories, it is impossible to calculate detailed sector-wise import penetration figures based on Federal Customs Service statistics.

We thus need to find an alternative way to calculate Russia's import development, namely on the basis of Russia's main trading partners' export statistics. In this paper we focus on Russian imports from the EU-25, as the relevant volume export data are available from Eurostat. According to the Federal Customs Service, the EU-25 have had a rather stable share of 44% in Russian imports over the past decade. A comparison of Eurostat data on exports to Russia with CBR import data also shows a quite stable average share of 48% for the same period. Hence, we use EU-25 exports as a proxy for developments in Russia's total imports. Still, we are aware that the structure of imports from the EU-25 is not similar to that of imports e.g. from China or the Commonwealth of Independent States (CIS). China's exports to Russia record a higher share of textiles and agricultural products with a lower value added than exports of the EU-25 and other OECD countries. However, we can probably assume that the structure of EU-25 exports closely corresponds to the export structure other OECD countries. According to the Federal Customs Service, the OECD countries account for 61% of Russia's total imports. Acknowledging the limitations in trade statistics, we still use EU-25 data from Eurostat for lack of any better alternative.⁸

We regrouped the Eurostat EU-25 data on exports to Russia from 12,061 categories according to the Combined Nomenclature (CN) eight-digit level to correspond to the international prodcom⁹ industrial output structure (C, DA-DM and E) that Russia has followed since the beginning of 2005. Finally, the data were indexed to 2005 prices.

An additional constraint to our approach is the lack of reliable long-term industrial production data. The methodological change introduced by the Russian statistical office, Rosstat, at the beginning of 2005 for the reporting of GDP and especially industrial production output statistics makes it hard to construct long-term time series on Russian industrial production by subsectors. We built a monthly time series backward from April 2006 to the beginning of 2002 and indexed it to 2005 sold production prices. Our analysis is thus limited by the data basis it relies on and by the rather short time span it covers. Still, given that the rise in oil prices as well as the real effective exchange rate appreciation of the Russian ruble started to gather momentum at the beginning of this decade and continued largely unabated at least until mid-2006, our time frame for investigating the existence of the Dutch disease in Russia appears to be appropriate.

⁸ Other OECD countries, like the U.S.A., Japan and South Korea, also publish volume-based export data, so it would be possible to widen the scope. As these countries' data vary in terms of classification, however, combining them would be very time-consuming. Moreover, their trade pattern with Russia correlates strongly with that of the EU-25. China and the other CIS countries do not publish detailed data on volume exports.

⁹ Prodcom is a system for the collection and dissemination of statistics on the production of manufactured goods. The title comes from the French «PRODUCTION COMMUNAUTAIRE» (Community Production) for mining, quarrying and manufacturing: sections B and C of the Statistical Classification of Economy Activity in the European Union (NACE 2). See <http://epp.eurostat.ec.europa.eu>.

3 Results: EU-25 Import Competition

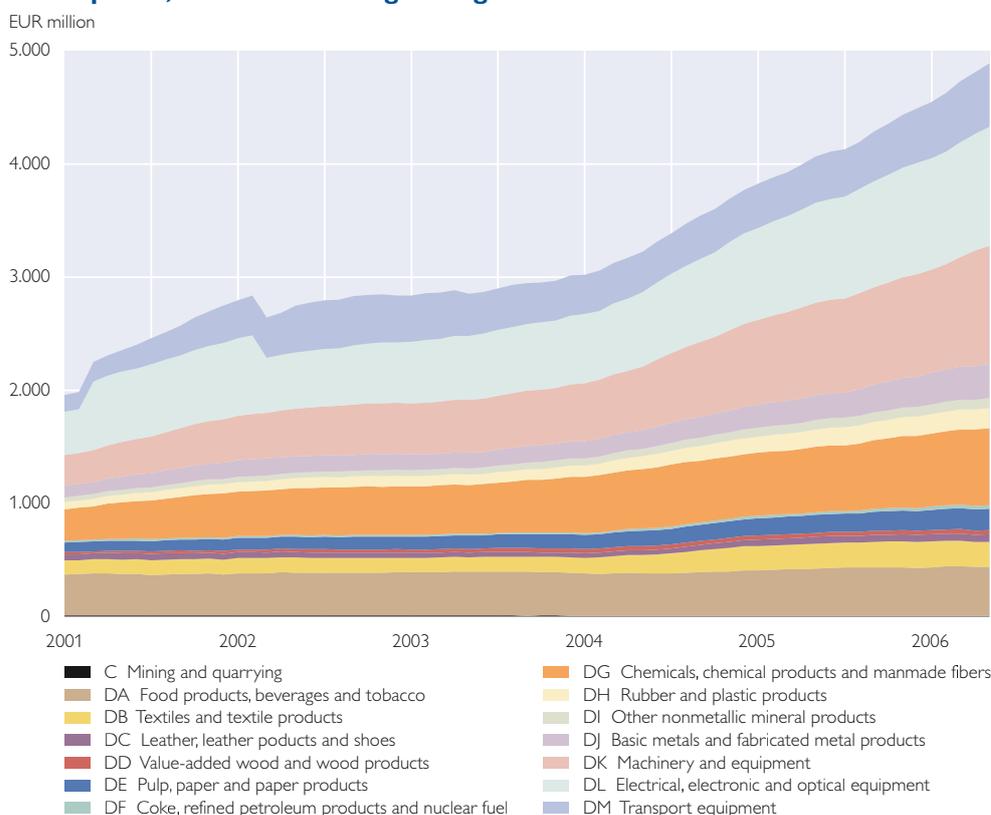
In nearly all categories reviewed, imports grew much faster than domestic production. Between 2000 and 2005, total imports increased by over 20% a year (in volume terms), while exports augmented by no more than 9% and production by little over 6%. Russian import elasticity is currently above 3, which is much higher than in emerging markets on average. The imbalance in the growth of export and import volumes, however is not yet visible in Russian trade or current account figures (as measured in U.S. dollars), as energy prices have kept rising over the whole period under review. If imports grow at such a quick pace, however, there is reason for concern. And if oil prices stop increasing or even fall for a sustained period, the underlying trade deficit will become visible. In the following section, we show the main results of our comparison of imports to Russia from the EU-25 with domestic production.

Chart 2 illustrates the structure of EU-25 exports to Russia between 2001 and 2006. Russian imports from the EU-25 consist mainly of machinery and equipment (DK), electrical, electronic and optical equipment (DL, in the following referred to as “electronics and optical equipment”), chemicals, chemical products and manmade fibers (DG, in the following called “chemicals”) and transport equipment (DM). The first two groups each accounted for about one-fifth of Russian imports from the EU-25. Given the

Chart 2

Structure of EU-25 Exports to Russia (2001–2006)

2005 prices, 12-month moving average

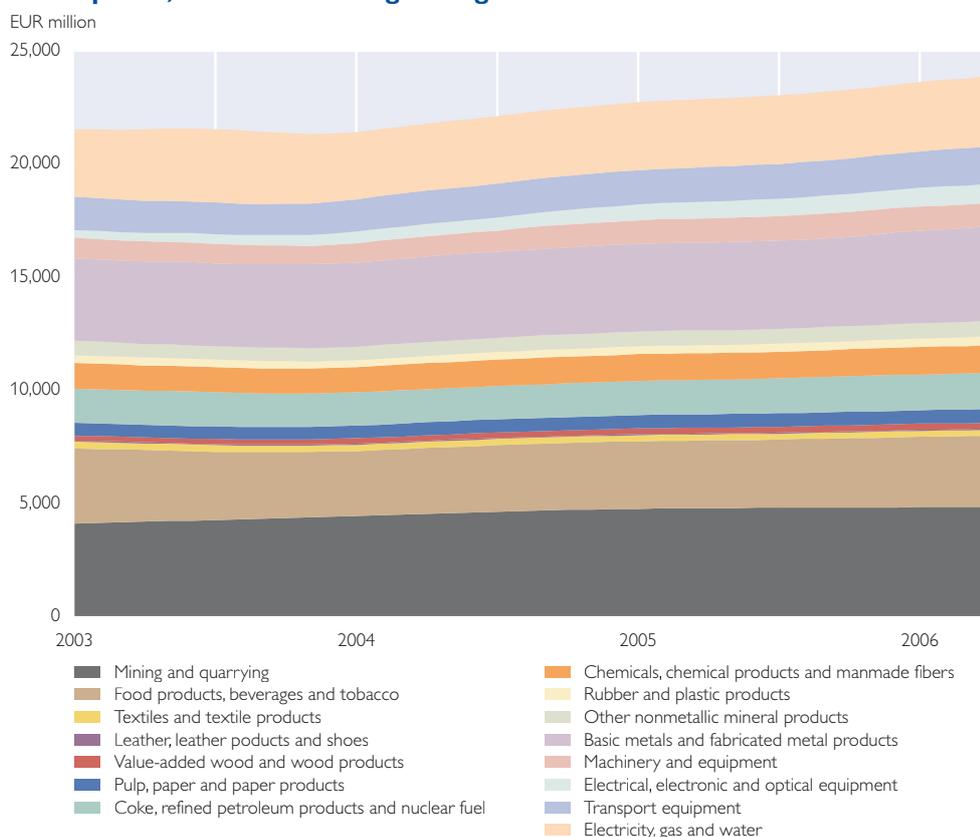


Source: Eurostat, Rosstat.

Chart 3

Industrial Production (2002–2006)

2005 prices, 12-month moving average



Source: Eurostat, Rosstat.

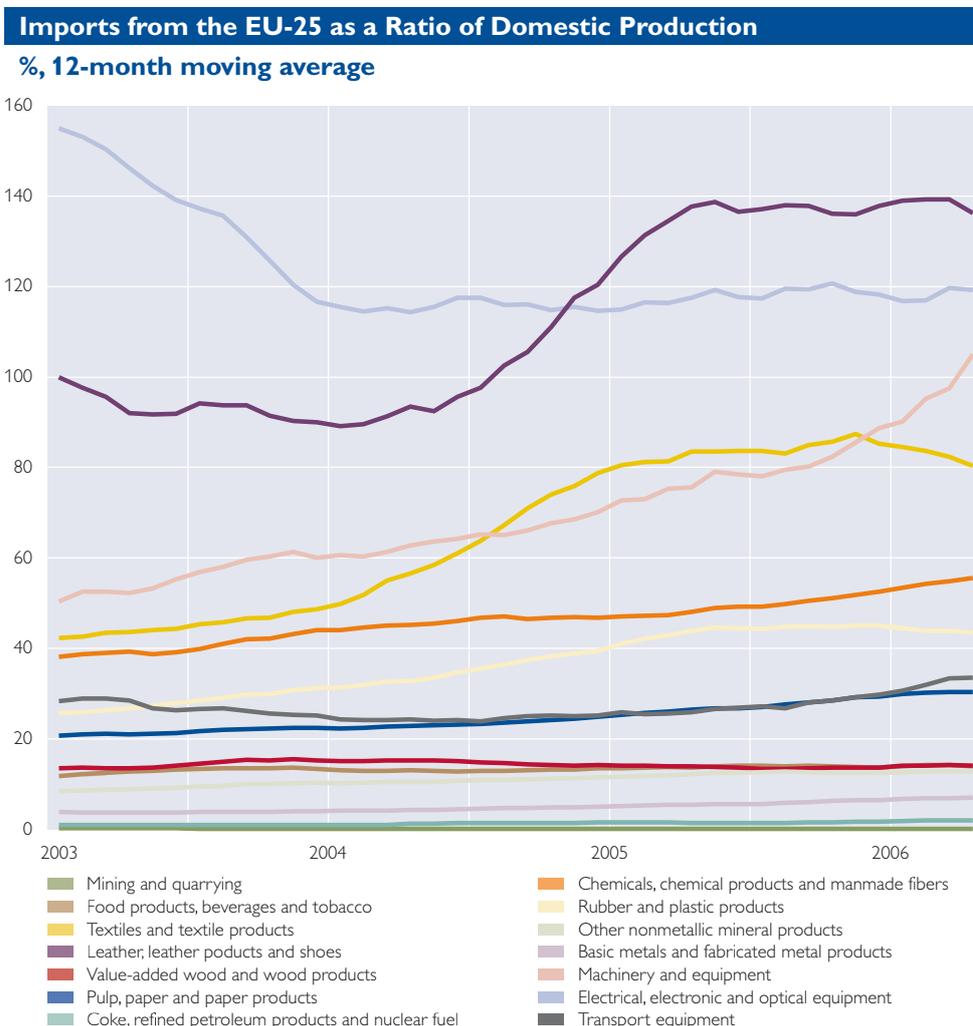
Note: See chart 2 for the abbreviations of the individual production categories.

inherited production structure, both groups could be important factors in the development of Russia's own competing nonfuel industry.

In mining and quarrying (C), only non-energy producing material (CB) was imported from the EU-25. Russia was fully self-sufficient in the mining and quarrying of energy products (CA). The monthly time series in Russian industrial production volume data do not distinguish between CA and CB; we therefore only compare total mining and quarrying production with imports. There were also no electricity, gas or water (E) imports from EU-25 countries.

Chart 3 shows the structure of Russia's industrial production. Mining and quarrying is by far the largest group, corresponding to nearly one-fifth of total production. Within this group, the largest contribution to production comes from the energy sector. It should be noted that oil refining also plays a role in the manufacture of coke, refined petroleum products and nuclear fuel (DF, in the following called "energy") as well as of chemicals. Energy and chemicals each account for about 5% to 6% of Russian industrial production. Accounting for nearly 18% of overall industrial output, the manufacture of basic metals and fabricated metal products (DJ, in the following referred to as "metals") has the second-largest share in production. These two categories mainly represent

Chart 4



Source: Eurostat, Rosstat.

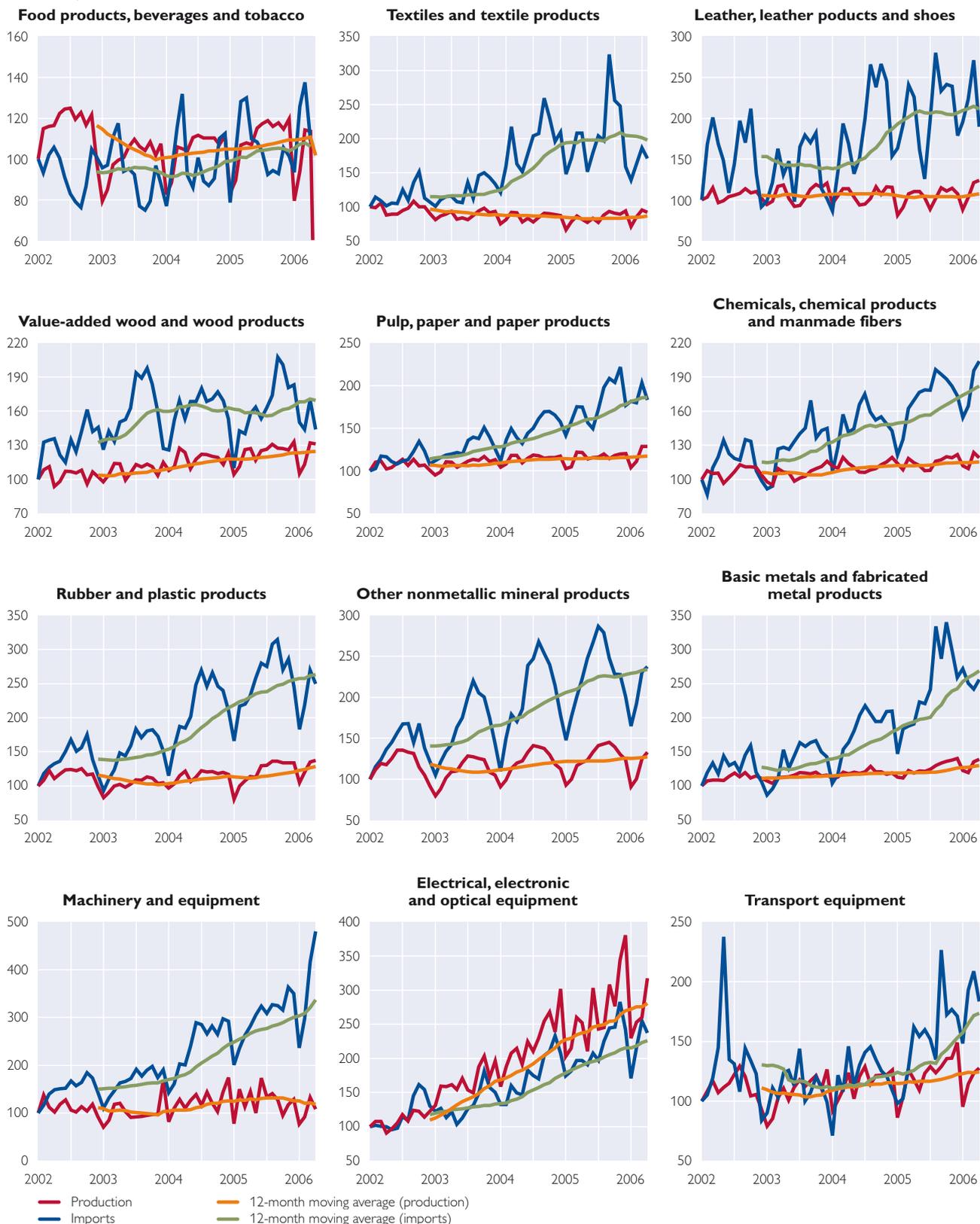
Note: See chart 2 for the abbreviations of the individual production categories.

low value-added manufacturing. The manufacture of electricity, gas and water and the manufacture of foodstuffs, beverages and tobacco (DA, “food”), which account for about one-eighth of production each, have the third-largest share in production. While no import competition from the EU-25 is registered for electricity, gas and water, food is the largest industry in Russia that really has to compete with imports. Other significant industrial clusters are the manufacture of machinery and equipment, electronics and optical equipment, and transport equipment, each accounting for around 4% of production. The output of other industrial clusters was very small. Total production growth has been slow over the last few years.

Chart 4 presents the ratio of imports from the EU-25 to total domestic production in Russia. In 2005 and 2006, imports from the EU-25 exceeded domestic production in the manufacture of leather, leather products and shoes (DC, “leather products”), electronic and optical equipment, and machinery and equipment. Imports from the EU-25 have reached a level of about 80% of

Production and Imports of Industrial Clusters* (2002–2006)

Index: January 2002=100

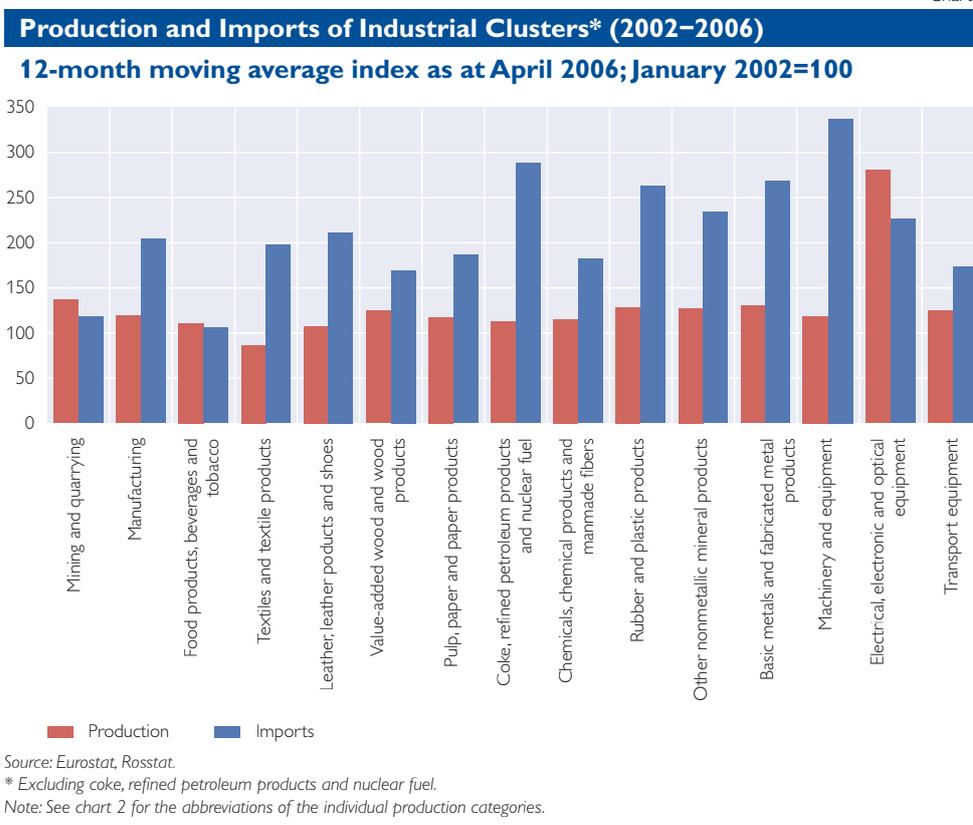


Source: Eurostat, Rosstat.

* Excluding coke, refined petroleum products and nuclear fuel.

Note: See chart 2 for the abbreviations of the individual production categories.

Chart 6



Russian production in the manufacture of textiles and textile products (DB, “textiles”). In most of the above-mentioned categories, import penetration has rapidly increased in recent years.

Imports from the EU-25 are marginal or modest in categories like mining and quarrying, metals, other nonmetallic mineral products (DI), value-added wood and wood products (DD, “wood products”) and food. Of these categories, mining and quarrying, metals, nonmetallic mineral products and wood products are all natural resource clusters or booming sectors, while only food is clearly a “lagging sector.” With imports from the EU-25 corresponding to between 30% and 60% of domestic production, all other categories record a clear trend toward increasing import penetration.

Charts 5 and 6 contrast sectoral import growth with production growth in two different types of representation (current index data and bar chart). The charts show all the above-mentioned industries except energy, a sector in which Russia is largely self-sufficient and EU import competition is marginal. We see that imports grow significantly faster than domestic production in all categories except food, and electronic and optical equipment. Food production increases almost at the same pace as imports, which shows that food is an industry where domestic enterprises are doing relatively well. Corresponding to between 12% and 13% of domestic production in volume terms, imports from the EU-25 are still significantly smaller than domestic production. Most

of the larger food import categories are in fact complements¹⁰ where Russia does not have its own production. Moreover, high import duties on most foodstuffs partly limit import growth. In general, the Russian food industry is among the industries that are most strictly protected from foreign competition by various means; customs duties were 15% on average in mid-2006.¹¹

The situation is different for electronic and optical equipment, as both domestic production and imports in this sector have grown fast in recent years. Imports from the EU-25, however, clearly exceed domestic production. These imports mainly comprise mobile phones and mobile phone parts (about one-fourth), computer parts, and consumer electronics. However, most of the commodities in this sector are high-value consumer goods Russia itself does not produce. The respective import duties averaged 10% during the observation period.

In most of the other categories, imports have nearly doubled or even tripled since the beginning of 2002, with machinery and equipment recording the fastest import growth. Imports have expanded threefold since 2002, while domestic production rose only little. Machinery and equipment imports from the EU-25 are quite heterogeneously distributed between various categories. One can argue that imports increase as machinery and equipment is needed to develop the domestic manufacturing sector and equip households with appliances. However, Russia could supply goods from domestic production in many of these categories. The development in the machinery and equipment category in Russia is reason for concern, as imports have grown so fast. The sectoral import duty was 12% on average in mid-2006. Growth trends are also worrying for leather products, whose domestic production has grown modestly and whose imports have nearly doubled since 2002. The ratio of imports from the EU-25 to domestic production in this sector was highest in early 2006 at 140%. It is rather difficult in this case, however, to distinguish between luxury goods and standard consumer goods. The average import duty for leather products was 11%.

In the textiles sector, the import ratio expanded from 40% of the domestic production level in early 2003 to 80% in late 2005. Textiles were the only category where domestic production went down in the period from 2002 to 2005. The distribution of imports was also quite heterogeneous. Some of the categories clearly qualify as complements or special articles – categories in which Russia does not have its own competing production. The average customs fee for textiles was 12%. Moreover, most of textiles imports to Russia come from Asia, not Europe, and hence the comparison with EU-25 export data does not give a full picture of import competition in this sector.

¹⁰ *Complements are materials/goods that complement domestically produced goods, as opposed to substitutes, which replace domestically produced goods.*

¹¹ *Russia uses various trade barriers, like import duties, product certificates and quotas, to protect especially the food industry from foreign competition. It is difficult, however, to measure the quantitative effect of the various trade barriers, which is why our focus here is exclusively on average import duties, given the availability of the relevant data which should also indicate a general level of protection for certain industries. Customs duties remained quite stable during the period under observation; the average Russian import tariff was about 12% to 13% in 2006. References to customs duties below are taken from Simola (2007).*

Import growth was more restrained in wood products, pulp, paper and paper products (DE, in the following called “paper”) and transport equipment – categories in which imports from EU-25 countries have grown more modestly (i.e. by less than 100%) since 2002. In the sector of wood products, imports from the EU-25 correspond to around 15% of Russian domestic production, which is still of low quality and developing slowly. Given that Russia’s wood reserves are among the largest worldwide, however, the economic potential for wood products is obvious. The average customs duty for imports in these categories was 13%. Paper imports from the EU-25 correspond to about 30% of the domestic production level. Russia purchases large quantities of paper abroad to satisfy domestic demand for paper products (especially newspapers and journals), which is also visible in the structure of imports from the EU-25. Parts of Russia’s newspapers and journals are in fact printed outside the country, as production quality is better abroad and production capacities in Russia are insufficient. Such a big consumption-driven cluster would leave ample potential for stepping up domestic production. The average customs duty in this category came to 11% in the period under review.

In transport equipment, import growth has been more moderate than in most other industrial clusters. In this category, the ratio of imports to domestic production reached 30% in early 2006. Interestingly, passenger cars accounted for over 40% of transport equipment imports from the EU-25 in 2005; aircraft and spacecraft came to 14%, and other vessels (including boats and ships) and parts accounted for the rest. According to reports by the Federal Customs Service, car imports, which are the main drivers of import growth, have doubled annually in recent years. The average import duty in the sector was 11% in mid-2006. However, duties were higher on a number of specific products, such as passenger cars (coming to at least 25%), which might be an important reason for establishing car plants in Russia.

Arguably, energy, chemicals and nonmetallic mineral products could also be classified as belonging to the fuel sector. Domestic energy production has grown at a slower pace than energy imports, which mainly comprise a variety of oils and – at a ratio of 30% to domestic output – do not constitute a serious threat to domestic production. The average energy customs duty was only 5%. The ratio of chemicals imports from the EU-25 to Russian domestic production grew from 40% to 60%. Accounting for about one-third of chemicals imports from the EU-25, medical products recorded the highest import shares. Most of the main subgroups in this sector are luxury goods Russia does not produce domestically (which is one of the reasons for the faster growth of imports). Although Russia has its own production in the medical sector, imports are clearly in the lead. The average customs duty for chemicals was 9%. In the area of nonmetallic mineral products, imports from the EU-25 corresponded to about 10% of domestic production. Various glassware accounted for one-third of imports, while various ceramics and semi-finished goods accounted for the rest. In all these categories, Russia has the potential for significant domestic production. With import duties coming to about 16% in mid-2006, which is clearly above average, protection for nonmetallic mineral products is rather pronounced.

For rubber and plastic products (DH, “rubber and plastics” for short), the ratio of imports from the EU-25 to domestic output went up from 20% to 40%. Here, the major categories of imports from the EU-25 were rubber tires, plastic plates, sheets, foil and film – in all these categories, competing domestic industries should exist. The average minimum import duty for rubber and plastics was 9% in mid-2006. For metals, the ratio of imports from the EU-25 to domestic production was about 5% and the import duty came to about 11% on average.

4 Conclusions: Russia Shows Symptoms of the Dutch Disease

Our approach showed that in the period from early 2002 to early 2006, Russian imports grew significantly faster than domestic production in nearly all product categories. This trend partly reflects overall economic developments, given that total Russian import growth (in terms of volume) has been nearly three times faster than GDP expansion during this period. In many industrial clusters, the share of imports is still small compared with competing domestic production; moreover, the imported goods are not necessarily substitutes of domestic products. This means that in some categories there are reasons behind the strong import growth which are not related to changes in the competitive position of Russian manufacturers. In categories like leather products, machinery and equipment, and electronic and optical equipment, however, imports from the EU-25 alone exceed domestic production. Moreover, imports of textiles nearly equal domestic production. Import growth exceeds domestic production growth in all sectors except electronic and optical equipment.

This could, however, imply that electronic and optical equipment may be an infrequent but important example of Russian firms (so far) withstanding foreign competition in a modern technological area. Textiles and leather products are marginal in total imports. Contrary to the situation of electronic and optical equipment, Russia’s competitiveness appears to be waning in the realm of the other major import component from the EU-25, machinery and equipment. One should point out, though, that a large share of machinery, equipment and electronics imports is accounted for by investment goods, which may help the country build up competitive industrial structures. The textiles sector is clearly deindustrializing, as domestic production is declining.

The trend observed in numerous other categories – paper, transport equipment, rubber and plastics, and chemicals – gives rise to concern. Import competition in wood products is still weak, but growing. By contrast, imports do not appear to threaten domestic production in mining and quarrying, energy, metals and nonmetallic mineral products. In food production, domestic industries are also doing well. However, foodstuffs are seen to benefit from one of the highest levels of Russian tariff protection. Russia’s WTO accession process promises to force highly protected industries to gradually lower import duties, which should increase import competition and raise pressures to restructure in the medium term.

Unlike most earlier studies on the Dutch disease in Russia, we clearly find a trend of increased overall import competition. This result is derived using EU-25 trade data, which correspond to about one-half of Russia’s value-based

imports. Total imports are therefore probably twice as large as indicated by our exercise. In our view, the observed tough import competition might be interpreted as a certain degree of the Dutch disease syndrome in many of the Russian industrial production sectors, especially in some important ones that might have the potential to drive economic diversification. This overall picture may correspond to an incipient deindustrialization process that affects large parts of manufacturing.

However, our approach is limited in a number of ways. First, we are only examining what we see as the last link of the hypothetical causality chain of the Dutch disease theory. This last link may be exposed to other influences lying outside the causality chain. For example, Russia's strongly rising average income levels in recent years have obviously contributed to making higher quality imports more easily accessible to the average Russian population. Second, it is still difficult to distinguish between substitutes and complementary products, as this would require more detailed industrial output data. Third, the time span under review is rather short. Fourth, we do not have full volume-based data on total Russian imports.

Despite these limitations, we show that – based on the simple Dutch disease theory of import competition versus domestic production – Russia has reasons to worry. Of course, higher competition and rising purchases of capital equipment may contribute to improving the productivity of domestic production and to boosting Russia's competitiveness in the medium and long term. Mounting import competition in recent years may also largely reflect some structural adjustment related to Russia's transition and continuing integration into the global market.

However, such strong import growth against much slower growth in domestic production is not sustainable in the long term if Russia wants to diversify its production structure from being predominantly natural resource-intensive to focusing more on value-added manufacturing. The question of how to tackle the current challenge will therefore partly depend on how successfully policymakers manage the macroeconomic developments and how effectively they use the buffers created by the tight fiscal policy in recent years when oil prices were high. So far, their overall record in this regard is quite respectable. Notwithstanding Russia's recent redemption of its entire Soviet-era foreign debt from its stabilization fund means, the fund doubled in size in the course of 2006. Curtailment of domestic demand through taxing and sterilizing oil-related proceeds has doubtlessly contributed to countering Dutch disease pressures.

The outcome will also depend on the way in which policymakers handle structural adjustments and on how the investment climate evolves. An improvement of the Russian business environment could contribute to helping curb or contain the Dutch disease. In addition, increased integration with the world economy, induced by Russia's WTO accession, would probably force domestic manufacturing to become more competitive and offer new markets in the medium and long term. In the short term, however, import growth would speed up if customs tariffs were abolished.

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The Russian Oil Fund as a Tool of Stabilization and Sterilization

Vasily Astrov¹

The favorable world oil price dynamics has resulted in mounting reserves in the Russian Oil Stabilization Fund (OSF). This has raised the issue of an adequate economic policy response. Initially, the OSF was set up to reduce the vulnerability of the budget to the oil price volatility and to sterilize the impact of oil-related foreign exchange inflows on the money supply. Our findings suggest that the OSF has been instrumental in achieving both goals: it has contributed to macroeconomic stability and has helped decouple the GDP growth rate from oil price dynamics. However, given the current size of the OSF and a widely shared expectation that oil prices will remain comparatively high, the present dilemma is whether the OSF should be increasingly spent or whether it should be saved as a wealth-generating vehicle. Spending from the OSF on a current basis has been resisted so far largely because of rampant corruption and fears of inflation. However, there are several arguments which may support a change in this policy stance. In particular, it seems that concerns about intergenerational solidarity are of minor relevance for Russia; investments in the country's infrastructure are badly needed which, via productivity gains, might counteract the possible Dutch disease effects; moreover, spending on public sector wages could reduce incentives for corruption.

1 Introduction

Russia's economic performance since 2000 has been impressive: the Russian economy grew by some 40% in real terms between 2000 and 2006. The recovery was triggered by the ruble devaluation in the aftermath of the 1998 financial crisis and its positive impact on the country's competitiveness. In parallel, it was increasingly driven by the soaring world prices of oil and natural gas, which account for over one-half of total exports and are thus the country's two main export commodities (see e.g. OECD, 2004). This high share indicates that the Russian economy is vulnerable to energy price volatility, which poses a challenge to fiscal management given the future revenue uncertainty.

Revenue uncertainty affects all countries that show a high degree of dependence on the exports of one particular commodity whose price is subject to sharp and unpredictable fluctuations. In many instances (including the situation in Russia since 2004), the fiscal policy response has been to accumulate extra-budgetary funds (often explicitly referred to as stabilization funds) in times of favorable external developments, with the aim of tapping these funds in case the external conditions deteriorate. In fact, in setting up an oil fund, Russia followed the example of 16 other countries, including Norway, a number of Middle East, African and Latin American countries, but also Kazakhstan and Azerbaijan. The U.S. state Alaska operates two oil funds (one

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each for saving and stabilization purposes),² while Chile has established a copper stabilization fund.

The previous experience with stabilization funds has been mixed (see e.g. Bartsch, 2006; Kalyuzhnova, 2006; Vatansever, 2005; Davis et al., 2001; Fasano, 2000). In Kuwait, Norway and Alaska, for example, the funds have indeed been effective tools of asset-building aimed at counteracting a future projected decline in oil revenues or a projected increase in social outlays (as in Norway). However, in some other countries, e.g. Oman, Nigeria and Venezuela, the experience with oil funds has been less positive – arguably because of frequent changes to the fund rules and deviations from its intended purposes. Thus, Venezuela serves as an ironic example of a case in which the whole concept was perverted, as the moneys transferred to the stabilization fund over the 1990s were financed with growing government borrowing. Generally, commitment to fiscal discipline and sound macroeconomic management has been crucial in the successful creation of funds.

This paper deals with the institutional setup, the past performance and the available policy options for the Russian Oil Stabilization Fund (OSF).³ Section 2 outlines the OSF's rules, while sections 3 and 4 analyze the OSF's performance as a tool of macroeconomic stabilization and monetary sterilization, respectively. Section 5 concludes and outlines future scenarios.

2 Features of the OSF

The OSF was established in January 2004⁴ with the purpose of (1) reducing the vulnerability of the state budget to the volatility of world oil prices (stabilization function), and (2) sterilizing the impact of oil-related foreign exchange inflows on the money supply and inflation (sterilization function). By the end of last year, the OSF had built up assets worth more than RUB 2.3 trillion (about 9% of Russia's 2006 GDP).

The OSF accumulates money as long as the world price for Russia's Urals oil exceeds the cutoff price (which was initially set at USD 20 per barrel, but was revised to USD 27 starting from January 2006). The OSF can be tapped for covering federal budget deficits when the Urals price falls below the cutoff price.

The OSF collects revenues from two taxes, (1) a portion of the export duty on crude oil, and (2) a portion of the mineral resources extraction tax on oil. Both refer only to that part of the tax that stems from the world price in excess of the cutoff price.

² The stabilization and saving functions are to be distinguished. In line with theory, stabilization is one of the three essential functions assigned to the state (stabilization, allocation and distribution) and consists of smoothing the path of economic growth in the short and medium run by means of countercyclical policy. While the task of stabilization is generally faced by a wide range of countries (which are not necessarily commodity exporters), the need for stabilization in commodity-exporting countries typically results from commodity price volatility. In turn, the saving function applies in the long run and is confined only to countries whose natural resources are potentially depletable. In this case, after the country's available resources have run out, the accumulated savings are intended to maintain the living standards of future generations.

³ Moreover, recent decisions for OSF reform (adopted by the Russian parliament in April 2007) are taken into account as well.

⁴ The bulk of regulations covering the operation of the OSF are contained in *Ministerstvo Finansov Rossiyskoi Federatsii* (2006a, 2006b).

So far, taxes on oil products and natural gas have not been transferred to the OSF, although their prices closely follow crude oil prices.⁵

In addition, parts of the federal budget surpluses (which were attained even though the additional tax revenues from high oil prices were absorbed by the OSF rather than by the current budget) were transferred to the OSF as well. The federal budget surpluses stood at 4.2% of GDP in 2004, 7.5% in 2005 and 8.6% in the period from January to October 2006. The surpluses were partly attributable to deliberate targeting, but they were also helped by the conservative oil price assumptions underlying the budgets.

The OSF is managed by the Ministry of Finance and until mid-2006 was held entirely in Russian ruble that were deposited interest-free at the Central Bank of Russia (CBR).⁶ However, in summer 2006, a strategic decision was taken on converting the OSF into foreign-currency denominated assets, and the conversion had been completed by the end of the year. This is in line with the Budget Code provision stipulating that the OSF can be invested in foreign sovereign debt securities. The current government guideline is that these should be high-quality⁷ sovereign bonds of 14 developed countries – the euro area countries, the United Kingdom and the U.S.A. Thus, the OSF is currently held in a currency basket with the following composition: 45% in U.S. dollar, 45% in euro and the remaining 10% in pound sterling (this composition can be changed anytime by government decision). Technically, the government regulations provide for two theoretical options of the OSF's placement: Its funds can be used to directly purchase foreign bonds, and/or can be deposited in foreign currency-denominated accounts at the CBR, with the returns on these accounts being based on the performance of the underlying foreign debt securities. Currently, only the second option is being used.

In terms of risk diversification, investing the OSF in foreign (rather than domestic) assets seems justified, since securities issued by countries which would benefit from falling oil prices provide, to some extent, a hedge against excessive reliance on the oil revenues. Indeed, all three above-mentioned currency blocks (the United States, the euro area, and the United Kingdom) are heavily and increasingly dependent on imported fuels. However, in terms of profitability, the decision to hold the OSF in foreign bonds is ambiguous. In particular, it is not clear whether the nominal return of 4% to 5% per annum that these securities typically offer will match the combined effects of the Russian ruble's nominal appreciation and of the nominal return on ruble-denominated assets.

More recently, the government has been considering the option of investing the OSF in high-quality foreign corporate bonds.⁸ Investing the OSF in foreign

⁵ However, this will be changed as of February 2008 (see section 5 for details).

⁶ The main consideration behind keeping the entire OSF in Russian ruble were the perceived fears of the Russian assets 'abroad' being frozen as a result of possible international legal disputes.

⁷ With a AAA/Aaa credit rating from at least two of the three rating agencies Standard & Poor's, Moody's and Fitch IBCA.

⁸ According to the parliamentary decisions of April 2007 to reform the OSF, part of the OSF will be invested in corporate securities.

equities⁹ would be in line with Norway's experience and might have the advantage of higher returns in the long run, as demonstrated by past performance. However, particularly in the short and medium term, equities are riskier than bonds and could therefore create a problem regarding the stabilization function assigned to the OSF. At the same time, investing the OSF in foreign equities might make sense, given that the need for stabilization may be small in the short and medium term (see section 4 for details).

3 Sterilization Function

Given the small size of the Russian banking and financial sector and its overall state of development, the CBR has only few instruments at its disposal to sterilize the oil-related (and, since 2006, also capital-related) foreign exchange inflows. Against this background, the role of the OSF as a sterilization instrument has been crucial. As table 1 shows, the CBR's foreign assets have been growing rapidly and now account for nearly all assets. Between January 2004 and November 2006, the value of foreign assets more than tripled in nominal terms, which represents an increase by some RUB 5 trillion. This increase was sterilized only slightly (to the effect of some RUB 0.3 trillion) by a reduction in already modest domestic assets, notably in claims on government and banks. Still, only about one-third of the increase in (net) foreign assets has actually translated into monetary expansion (i.e. monetary base growth), as the value of reserve money increased by only RUB 1.5 trillion over the same period. The reason is that another RUB 3.3 trillion was absorbed by an increase in government deposits, two-thirds of it representing the OSF and the rest accounted for by other deposits (including those of the regional and local governments). Thus, the sterilization function of the OSF arises from the fact that foreign exchange earned from oil exports largely stays with the CBR, as it is held by the government in a CBR account. Alternatively, any use of OSF money for the purchase of domestic assets – whether physical or financial – would increase the monetary base and could lead to inflationary and appreciation pressures.

Obviously, the CBR's sterilization efforts were also supported by the early repayment of the external debt Russia owed the International Monetary Fund (IMF), the Paris Club and Vneshekonombank (which serviced Russia's sovereign external debt following the financial crisis in the period from 1998 to 1999) in summer 2005 and summer 2006 (see table 2). On both occasions, the CBR's foreign assets contracted temporarily, mirrored by a reduction of government deposits on the liability side of the CBR's balance sheet.

In turn, the gradual conversion of the OSF from ruble into foreign currency, which took place in the second half of 2006, did not matter in macroeconomic terms. Also, it cannot be traced from the CBR's balance sheet, at least at the aggregation level presented in table 1. The conversion presumably resulted in a mere substitution of ruble-denominated government deposits by foreign currency-denominated government deposits on the liability side of the CBR's

⁹ This proposal was initially put forward by the Russian first deputy prime minister Alexander Zhukov (according to his announcement of May 2006, Russia could invest up to 10% of the OSF in equity – see Pryde, 2007) and re-confirmed recently by the finance minister Alexei Kudrin (International Monetary Fund 2007b).

Table 1

Balance Sheet of the Russian Monetary Authorities between 2004 and 2006

RUB billion

	2004		2005		2006		
	1.1	1.7	1.1	1.7	1.1	1.7	1.11
Assets							
Foreign assets	2.391,097	2.739,562	3.610,482	4.623,996	5.554,814	7.112,379	7.448,038
Claims on government	477,639	445,643	426,555	334,788	276,042	248,853	247,957
Claims on nonfinancial public organizations	55	50	39	33	28	28	26
Claims on private sector and households	2,264	2,122	2,282	2,253	2,439	2,419	2,437
Claims on credit organizations	198,742	219,864	178,230	200,222	27,892	24,334	117,159
Liabilities							
Reserve money	1.947,713	1.959,538	2.417,880	2.514,463	2.959,306	3.349,946	3.454,230
<i>of which: money outside banks</i>	1.147,039	1.276,132	1.534,756	1.650,743	2.009,240	2.233,366	2.402,172
Term deposits and foreign currency deposits	5	6	17	10	35	23	17
Foreign liabilities	220,639	235,699	214,928	241,293	298,812	314,285	148,027
Government deposits	446,001	799,740	1.047,912	2.050,321	2.146,032	3.361,712	3.785,069
<i>of which: regional and local government</i>	43,805	100,796	85,580	200,475	126,695	294,730	432,473
Capital accounts	298,234	298,047	188,043	187,826	210,373	210,177	210,041
Other (net)	157,207	114,212	348,806	167,380	246,657	151,872	218,234

Source: Central Bank of Russia.

balance sheet and a corresponding replacement of foreign exchange with foreign debt securities within the item “foreign assets” on the asset side of the CBR’s balance sheet.

The sterilization policy by means of the OSF has certainly contributed to macroeconomic stability. Despite the soaring oil prices, the Russian economy has not shown signs of excess aggregate demand, despite buoyant private consumption and rather solid capital formation. Inflation has been falling slightly, and the current account balance is still strongly positive.¹⁰

4 Stabilization Function

According to the current regulations, the OSF can be spent to cover the federal budget deficit when the oil price falls below the cutoff price. However, it can also be tapped for other purposes in case it has accumulated more than RUB 500 billion. Given the persistently high oil prices¹¹ that hover far above the cutoff price, the RUB 500 billion threshold had already been surpassed by the end of 2004. As a result, the OSF funds were subsequently used to repay the country’s foreign debt and to cover the public pension fund deficit (see table 2). The RUB 1.25 trillion worth of early settlement of public foreign debt, largely ahead of schedule, enabled the country to economize on interest payments and represented a net financial benefit to the state – even after allowing for the penalties charged to Russia for the premature contract withdrawal. Since the payments were financed from OSF funds, they had no macroeconomic impact within the country. The modest RUB 30 billion

¹⁰ See e.g. Havlik (2007) and Hildebrandt et al. (2007).

¹¹ The average price of Urals oil rose from USD 34.3 per barrel in 2004 to USD 49.9 per barrel in 2005 and to USD 66 per barrel in 2006.

Table 2

Dynamics of the Oil Stabilization Fund between 2004 and 2006			
RUB billion	2004	2005	2006
Inflows/revenues			
Unspent federal budget surplus from previous year	106	218	48
Oil revenues (export duty plus extraction tax)	416	1175	1643
Interest accrued			23
Outflows/withdrawals			
External debt repayment			
IMF		94	
Paris Club		430	605
Vneshekonombank		124	
Pension Fund		30	
Net inflows	522	716	1109
Balances, end of year	522	1,238	2347

Source: Russian Ministry of Finance, IMF, author's calculations.

worth of allocations to the pension fund had a similarly small, or virtually no impact at all.¹²

Despite these expenditures, the OSF totaled USD 89.13 billion (corresponding to RUB 2.35 trillion) on January 1, 2007. The OSF's pivotal role as a tool of economic stabilization can be seen from the following estimations (Gurvich, 2006). In the period from 2004 to 2005, some 75% of the additional fiscal revenue from the high oil prices were saved (primarily in the OSF), amounting to some 60% of total additional income to the economy. Accordingly, the Russian federal budget would have shown only a minor deficit even if the oil price had fallen back to USD 20 per barrel. The recent economic performance suggests that the OSF, by building up reserves rather than spending extra revenues, has also helped decouple GDP growth from the oil price dynamics. Despite the soaring oil price since 2004, the country's economic growth has been fairly stable at 6% to 7%.

The current size of the OSF is nearly five times the value of the RUB 500 billion threshold, above which the funds can be used for purposes other than budget deficit financing. The pressure to spend the OSF is all the more intense as most short- and medium-term oil price forecasts assume values above USD 50 per barrel, and it seems extremely unlikely that the price will fall below USD 27 (the current cutoff price set for the OSF). This implies that stabilization in the sense in which it was meant at the time when the OSF was set up, i.e. as a buffer for federal fiscal balances, is unlikely to be required anytime soon.¹³

¹² Like in many other countries, the public pension fund deficit in Russia is largely "structural" and is due to the current shift from a "pay-as-you-go" to a funded system.

¹³ A compromise solution which has been adopted by the Russian parliament in April 2007 is to divide the OSF into two parts from February 2008, (1) the so-called Reserve Fund, which will be maintained at 10% of GDP and which will serve the purpose of fiscal stabilization (in line with its original goal) and will be invested in highly liquid and low-yielding foreign securities, and (2) the Future Generations Fund, which will preserve the oil-generated wealth in the long term and could be partly invested in corporate securities (OECD, 2006; IMF, 2007a).

5 Assessment and Outlook

The present dilemma for the Russian authorities is to decide whether the OSF should be increasingly spent or saved as a wealth-generating vehicle, which would make it more similar to Norway's Government Pension Fund based on the idea of intergenerational equity.¹⁴

According to some projections (e.g. World Bank, 2006), if the OSF is not tapped, its value may reach USD 400 billion in 2010 and USD 900 billion in 2020 (in real terms). One forward-looking possibility for the government would be to refrain from tapping the OSF for some time, e.g. until 2015, then to keep the real value of the OSF constant and, in line with the above projections, still have annual funds of some USD 80 billion at its free disposal. These funds would stem from the newly accrued real interest on existing OSF assets and from the new oil revenues. They are comparable with the current annual budget share of the mineral resources extraction tax and the export duty on oil. This scenario is rather conservative, but it is still less conservative than the so-called bird-in-hand rule that was implemented in Norway in 2001, whereby only newly accrued interest on fund assets is spent. There is good reason for the conviction that the Russian model should be less conservative than the Norwegian one. Given that the Russian economy is likely to grow much faster than the Norwegian one (in line with the hypothesis of beta convergence), concerns about intergenerational solidarity appear to be less relevant in the case of Russia, as future generations will presumably be much wealthier than the present generation of Russians (OECD, 2006).

Alternatively, the government could decide to spend at least part of the accumulated OSF money now, or else spend (part of) the future inflows into the OSF on a current basis. Among the projects which have been proposed recently as possible candidates for OSF financing are the construction of an oil pipeline to the Pacific coast, development loans, asset acquisitions in the Commonwealth of Independent States (CIS) and Eastern Europe as well as financing a value added tax reduction. However, no commitments have been made so far – except for the early repayment of external debt mentioned above and the minor allocation to the pension fund.

Apart from precautionary considerations (which are subsiding, though, for the reasons outlined above), two main arguments have been typically raised by Russian liberal-minded economic policymakers¹⁵ against spending the OSF money already now or on a current basis. They maintain that (1) given the extensive corruption at all government levels, any spending within Russia would be inefficient, and that (2) any domestic spending of the OSF money would be inflationary.

Nevertheless, recent estimates by the IMF (which usually advocates a cautious approach in fiscal issues) suggest that the current volumes of federal government spending in Russia are not only far below levels that would be unsustainable in the long run, but are in fact suboptimal (IMF, 2006).

¹⁴ Following the parliamentary decisions for OSF reform of April 2007 (see previous footnote), the considerations have to be related to the issue of designing saving and spending of oil-generated revenues in the framework of the Future Generations Fund.

¹⁵ Including the finance minister Alexei Kudrin and the former presidential economic adviser Andrei Illarionov.

In particular, primary budget expenditures would have to be raised by some 5 percentage points of GDP in the medium term in order for the government to reach the so-called permanent consumption rule, which maximizes consumption (expressed as a constant share of expenditures to GDP) over time.

The case for spending more becomes even stronger if we allow for the possibility that the money is not just used for consumption, but also invested. Such investment could, for instance, be directed to upgrading the country's infrastructure, thus encouraging private investment in the nonenergy branches of economy. In this way, if the government decided to use the OSF money domestically, it would contribute substantially to the diversification of the Russian economy, which is certainly one of its goals. This diversification would, in turn, contribute e.g. to the stability of public finances. Besides, any resulting productivity improvements in the nonenergy tradable sector would counteract the possible Dutch disease effects stemming from higher inflationary pressure and an additional ruble appreciation potentially associated with spending part of the OSF reserves.¹⁶

The government could also target e.g. education, health and ecological cleanup activities with these investments. Although the value of such investment might be difficult to quantify in economic terms, it is fairly obvious that it would raise the living standard of the population. In addition, it could also lay the foundation for long-term sustainable economic growth, e.g. thanks to human capital accumulation.

Provided that the (net) benefits are positive, additional spending could be advocated even if institutional weaknesses limit the effectiveness of public expenditures. One might also argue that some additional spending, e.g. in the area of public sector wages, in combination with other measures, could even reduce the incentives for corruption in these areas, which in many cases reflect peoples' efforts to make ends meet.

Any sizeable domestic spending of the OSF money would pose a serious challenge to the country's macroeconomic management. In particular, it is essential that any major withdrawal of government foreign currency-denominated deposits at the CBR and their subsequent conversion into ruble be accompanied by corresponding policy coordination with the CBR.¹⁷ The aim of such an approach would be both to avoid unwelcome appreciation pressure (and the likely speculation on such appreciation) and to leave open the possibility for counteracting any unwarranted depreciation pressure in the future. At the same time, the appreciation pressure (and the inflationary pressure alike) is likely to be kept within limits as long as additional government spending is import intensive, e.g. made within the framework of infrastructure development programs involving large-scale imports of investment goods.

¹⁶ See also Barisitz and Ollus (2007), who argue that, in the recent past, curtailment of domestic demand through the OSF has doubtlessly contributed to countering Dutch disease pressures.

¹⁷ For instance, the ministries of finance in the Czech Republic and Poland had explicit agreements with the respective central banks on depositing privatization-related one-off foreign currency inflows in a special account and on converting funds from these accounts into national currency directly with the central bank, i.e. off market.

Leaving aside economic considerations as to whether part of the OSF money should be spent sooner rather than later, we may also ask whether it might be appropriate to redesign some rules governing the OSF. In particular, the threshold of RUB 500 billion above which the government is free to decide on tapping the OSF could be adjusted upward to make it more meaningful. Fixing the nominal level of the threshold disregards both economic growth and inflation. Meanwhile, the task of stabilizing a bigger economy would clearly require a greater pool of resources and therefore a higher threshold value. This would not preclude spending the OSF funds above a new threshold. On the contrary, it may well serve to assuage the precautionary considerations of those opposed to any spending of the OSF.¹⁸ Furthermore, it would make little economic sense to continue excluding exports of natural gas and oil products from the sterilization and stabilization approach underlying the OSF.¹⁹

All in all, the unexpectedly favorable world oil price dynamics and the resulting rise in OSF reserves have raised the issue of what is an adequate economic policy response under the new circumstances. The question of how to optimally invest OSF assets and whether or not – and how – to spend them for purposes other than stabilization will remain important in the macroeconomic policy debate in Russia for some time to come.

Cutoff date: April 30, 2007.

¹⁸ In this vein, the piece of legislation enacted in April 2007 within the framework of the far-reaching budget reform and maintaining a sizeable part of the OSF, namely 10% of GDP, for stabilization purposes (see footnote 13 in section 4) is to be welcomed.

¹⁹ In this respect, it is encouraging that the new legislation of April 2007 takes a more comprehensive approach. In line with the current budget reform, Russian federal public finances will be split into an “oil” and a “non-oil” part. From 2008 onward, the “oil” budget will be fed from all oil- and gas-related tax revenues (rather than only from tax revenues stemming from the oil price exceeding the cutoff price, as has been the case so far). Besides, the new legislation sets limits on the size of the “non-oil” deficit (4.7% of GDP) and on the maximum transfer from the “oil” to the “non-oil” budget (3.7% of GDP). Both limits will only become effective starting from 2011, while in 2008 to 2010, the size of the “oil transfer” is expected to be significantly higher at up to 6.1% of GDP in 2008 (Deutsche Bank, 2007).

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Selected Abstracts

The selected abstracts below alert readers to studies on CEE topics in other OeNB publications. You may find the full-length contributions at www.oenb.at.

Price Level Convergence in Europe: Did the Introduction of the Euro Matter?

Jesús Crespo Cuaresma,
Balázs Égert,
Maria Antoinette
Silgoner

Several theoretical arguments suggest that price level divergence across EU countries has diminished in the course of the European integration process as a result of both product market integration and the introduction of the common currency. In this paper, we empirically assess this hypothesis for the euro area countries and a group of control countries since 1990, using price level data on over 160 products and services in 27 European cities. Our conclusions confirm that price convergence took place at the beginning of the 1990s. There is, however, not much evidence that the introduction of the single currency has led to a further narrowing of price differentials. In fact, price dispersion has remained remarkably stable in recent years, whereas it has increased slightly since 2003 in the control group.

Published in *Monetary Policy & the Economy* 1/07.

The Euro on the Road East: Cash, Savings and Loans

Peter Backé,
Doris Ritzberger-
Grünwald,
Helmut Stix

The euro is already present throughout Central, Eastern and Southeastern Europe today. Against this backdrop, the OeNB has been regularly conducting household opinion polls for years in the countries that make up this economic space. The survey questions place special emphasis on euro cash holdings. The results show that the choice to hold euro cash is based on a wide variety of motives, above all geographic proximity, coupled with increasing economic interlinkages, the desire to minimize risk, and tradition. Decisions to have savings in euro or to take out euro-denominated loans can be attributed to similar considerations. In addition, macroeconomic factors such as inflation and exchange rate expectations may also play a role. What clearly emerges is that the extent of currency substitution varies considerably from country to country. In terms of cash, Slovenia, which was about to adopt the euro at the time of the most recent poll, is the frontrunner (approximately 40% of the population reported euro cash holdings in the second half of 2006). Hungary is last, with only a 7% rate. In terms of savings and loans, Croatia posts the highest percentage according to both the OeNB survey and the aggregated bank balance sheet data (approximately 80% of all savings deposits and/or borrowings of households and enterprises are denominated in foreign currency). At the opposite end of the spectrum is the Czech Republic, a country with approximately 10% in both areas.

Published in *Monetary Policy & the Economy* 1/07.

Booming, but Risky: The Ukrainian Banking Sector – Hot Spot for Foreign Strategic Investors

This paper gives an overview and assessment of the evolution of the Ukrainian banking sector since the outset of transition, focusing on the most recent developments. While the 1990s saw turbulent changes against the backdrop of continuous economic contraction, the Ukrainian banking sector has been on a strong expansion path ever since the turn of the millennium, a path which appears to have been only briefly interrupted by the minor crisis of late 2004 and early 2005. Although the National Bank of Ukraine has certainly improved banking regulations and supervision, the country's credit boom (sevenfold real increase of credit volume between 2000 and 2005, albeit from a modest base) has raised serious concerns about credit risks. Financial fragility continues to loom large in an environment where the practice of "pocket banking" (credit institutions acting as extended financial departments of owner firms) is still widespread. Over the past months, foreign strategic investors have started to move in: Led by Raiffeisen, which purchased the second-largest Ukrainian bank in October 2005, takeovers and business expansions have raised foreigners' share in total banking assets from 13% to 26% within a year. Austrians account for somewhat less than half of all foreign-owned banking assets in Ukraine.

Stephan Barisitz

Published in Financial Stability Report 12.

Stress Testing the Exposure of Austrian Banks in Central and Eastern Europe

Austrian banks are heavily engaged in Central and Eastern European (CEE) markets primarily by running local subsidiaries but also by extending cross-border loans. We give an account of the historical development and the status quo of these exposures and conduct a stress test for the Austrian banking system with respect to its credit exposure vis-à-vis the CEE region. Our test is based on an analysis of the current state of the local banking systems from a risk perspective, inter alia drawing on stress testing experiences gained by the national central banks and the International Monetary Fund. We use a stress scenario that (i) takes account of the differences in host country risks and (ii) represents a worst case that deliberately exceeds historical shocks. It turns out that, despite the dramatic worsening of the economic environment implied by the scenario, the Austrian banking system is not put at risk by the hypothesized crisis. The possible repercussions of a crisis in a single country via solvency problems of the Austrian parent institution turn out to be limited.

Michael Boss,
Gerald Krenn,
Claus Pühr,
Markus Schwaiger

Published in Financial Stability Report 13.

**Banking Efficiency and Foreign Ownership in Transition:
Is There Evidence of a Cream-Skimming Effect?**

Jaroslav Borovička

This paper revisits the issue of cost efficiency in the banking sector and the role of foreign ownership in European transition economies. The novelty of our approach is that we instrument for the decision of foreign investors to acquire domestic banks. This analysis allows us to evaluate the endogeneity bias that results from the so-called cream-skimming effect. Using a sample of 282 banks in 19 transition countries, we employ a two-stage instrumental variable approach. In the first stage, we estimate the probability of foreign acquisitions of domestic banks by implementing a panel probit model. In the second stage, the estimated propensity scores are used in the Battese and Coelli (1995) stochastic efficiency frontier specification. Although cost differences may also be caused by different product characteristics, our main finding is that the instrumental variable approach reveals that foreign ownership has a negative impact on cost efficiency. This observation indicates that in the transition countries studied the cream-skimming effect is significant, which implies that foreign investors tend to acquire the most cost efficient banks in the first place.

Published in Financial Stability Report 13.

The Changing Landscape of FDI in Europe

The OeNB's Conference on European Economic Integration 2006

The OeNB's third Conference on European Economic Integration (CEEI, the successor of the East-West Conference) took place from November 20 to 21, 2006, in Vienna. The OeNB organized the CEEI 2006 together with the European Bank for Reconstruction and Development (EBRD). The conference was entitled "The Changing Landscape of FDI in Europe" and covered a broad range of topics, such as global foreign direct investment trends, the effects of foreign direct investment (FDI) on home and host countries, policies to attract FDI and corporate FDI experiences, all with a special focus on the countries of Central, Eastern and Southeastern Europe (CESEE).

As in recent years, the conference met with an impressive response, with around 250 – partly high-ranking – participants coming from 30 countries, including balance of payments experts from international institutions, national central banks and ministries as well as researchers from renowned universities. The program featured keynote lectures, panel discussions and the presentation of academic research.

The conference was opened by OeNB Governor Klaus Liebscher, who highlighted the European perspective of FDI. At the very origin of the European integration project stood the hypothesis that economic – and later monetary – integration would boost trade and FDI flows, thus enhancing growth and the catching-up process. Indeed, empirical evidence and the most recent data support this hypothesis: In 2005, the European Union (EU) attracted almost half of all funds invested worldwide. The same year, FDI inflows into all ten new EU Member States (NMS) rose by 19%, reaching new record levels. Austria has for decades profited from outward and inward FDI flows, first as a typical FDI host country, but in recent years also as an increasingly active investor CESEE countries. Today Austria is the top investor in several countries in this region, but is facing more and more competition from what used to be typical FDI host economies, Governor Liebscher concluded.

In his opening remarks, Manfred Schepers, Vice President of the EBRD, focused on the importance of FDI for promoting transition. FDI brings innovation, new skills and risk management techniques; it promotes competition, forces domestic incumbents to become more productive, and provides forward and backward linkages. The EBRD continues to be the biggest investor/financier in Central and Eastern Europe (CEE). The bank invests about USD 4 billion in the region every year. The new EU Member States are expected to graduate from EBRD assistance within the next five years – which is an indication of the success of the strategy, Shepers underlined.

In his keynote lecture, Robert Lipsey, Director of the New York Office of the National Bureau of Economic Research (NBER), provided a comprehensive overview of the international literature on the effects of FDI, both on home

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and host countries, and using balance of payments as well as micro data. According to Lipsey, the success of countries like Ireland and China, which have achieved strong growth through strategic foreign investment, has motivated many economies to follow the example and open up to FDI. In his opinion, the most efficient policy measures to attract FDI are removing impediments, improving governance and creating reliable and predictable legal systems. FDI in CEE led to improvements at all levels of governance in the years before EU entry, but reform fatigue has set in since. While there is unequivocal evidence of productivity gains by foreign producers, evidence on crowding out of domestic players or on productivity spillovers to domestic firms is far less clear. In the ensuing lively and fruitful discussion, Lipsey stressed that fears of adverse home country effects of FDI may be exaggerated, but that structural adjustment was necessary to move the investor country up the skills ladder.

The first session of the day, chaired by Peter Mooslechner (OeNB), dealt with trends, patterns and determinants of FDI, both at a global level and from the Austrian perspective. Blanka Kalinova of the Organisation for Economic Co-operation and Development (OECD) elaborated on policy barriers to FDI, differentiating between restrictive product and labor market regulations and FDI-specific restrictions. According to OECD estimates, the alignment of product market regulations and FDI restrictions with the level of the most liberal OECD country would increase the total OECD inward FDI position by as much as 20%. Kalinova appealed to policymakers to reduce FDI protectionism, to enhance policy transparency, and to extend and encourage the acceptance of international investment policy standards.

Laura Resmini of Università Bocconi, Milano, provided an overview of the major determinants of FDI, focusing on locational advantages of individual countries. She noted that the impact of policy variables on FDI was less clear and less important than that of economic variables. Resmini emphasized that FDI in European transition countries has remained highly concentrated, both at a sectoral and at a geographical level. Competition for FDI funds is a phenomenon that takes place primarily between regions rather than across national borders. Especially in high-tech sectors this can be attributed to agglomeration effects.

René Dell'mour from the OeNB focused on the Austrian perspective of the changing landscape of FDI. Austrian FDI flows started to skyrocket following the fall of the Iron Curtain and Austria's application for EU membership in 1989. While inward FDI comes primarily from the EU-15 countries, outward FDI goes mostly to Central, Eastern and Southeastern Europe. In this context, Dell'mour highlighted Austria's role as a "bridgehead" for multinational enterprises, which can explain the simultaneous development of Austrian inward and outward FDI.

In the last presentation of this session, Arjan Lejour of Netherlands Bureau of Economic Policy Analysis focused on the specific patterns of FDI in the services sector, which account for 60% of total FDI flows. He attributed the large and growing weight of the service sector in total European FDI to the capital market and services liberalization, the increased services intensity of manufacturing and the trend toward outsourcing. Turning specifically to CEE,

Lejour stressed that services FDI in the region was below its potential. Its stock could be raised by 50% to 80% if regulatory reforms, anti-corruption efforts and improvements in tax administration were stepped up. At the EU level, Lejour expressed some disappointment about the potential benefits of the European Services Directive in its approved form. A complete elimination of barriers to services trade and investment in the EU may potentially increase FDI stock by as much as 200%.

The second session, chaired by Manfred Schekulin, Director at the Austrian Federal Ministry of Economics and Labour, investigated the question of "How to attract sustainable investment." The emphasis in the session's title is on the term sustainable, as measures to attract FDI need to be supplemented by efforts to maximize the beneficial effects of FDI also for the domestic economy.

As an introduction to the session, EU Commissioner László Kovács, Directorate Taxation and Customs Union, gave a keynote speech on "Tax Harmonization for Growth, Jobs and Competitiveness." He pointed out that many of the remaining barriers to the Single Market relate to the differences in tax systems across the EU countries, which impair transparency and thus competition in the Single Market and may harm the global competitiveness of European companies. The European Commission therefore strongly advocates as broad and simple as possible a harmonization of the tax base. What is not intended, however, is the harmonization of tax rates. The Commissioner did not exclude proceeding with his proposal with only a subgroup of EU countries if no broad consensus could be found.

In the first presentation of the session, Christian Bellak of the Vienna University of Economics and Business Administration elaborated on policies to attract FDI in Central and Eastern European countries (CEECs). He saw two strategies for countries in more mature phases of transition: a "low-wage, low-tech" and a "high-wage, high-tech" specialization strategy. Bellak argued that the attraction of sustainable FDI requires a match between the location factors of a host country and the particular value-added stages of foreign firms. He concluded that the CEECs should shift their focus from the provision of incentives and general location factors to more specific bundles of location factors for closely defined activities.

Summarizing evidence from the past two decades, Theodore H. Moran from Georgetown University reported that FDI as a means of import substitution in often protected domestic markets has failed to achieve sustainability as it does not promote the emergence of autonomous, mature industries. By contrast, export market-oriented FDI, typically an integral part of the parent companies' global supply chain, seems to have more beneficial effects on the home economy and is, moreover, not restricted to simple assembly operations with little value added. Moran praised the active FDI promotion strategy of CzechInvest, the Czech investment agency. The provision of one-stop shops to facilitate FDI approvals and give support for initial problems is a far more promising approach than the imposition of strict performance requirements on foreign investors.

A representative of CzechInvest, Jakub Mikulasek, described how the focus has shifted over the years from only attracting FDI to increasingly also

improving business conditions for the local enterprises. CzechInvest sees its tasks and challenges for the future in targeting the right potential clients, in supporting existing clients, in continuously adjusting its strategies and tools and in sustainably integrating FDI into the local economy. Mikulasek was skeptical about a proposal from the audience to create an FDI promotion agency at the European level. Competition for FDI funds today no longer takes place between large regions but rather between single cities or narrow regions in different countries.

In his keynote address, Ivan Pilip, Vice President of the European Investment Bank (EIB), stressed that cross-border investment in less familiar territory is – in addition to the usual credit risks – often associated with real or perceived political risks, such as currency risks, expropriation or civil unrest. The EIB mitigates these risks by providing loan finance for foreign investments on similar terms and conditions as within the EU and by reducing political risks through the conclusion of “framework agreements” with the host countries. These framework agreements provide for equal treatment, currency convertibility and transferability and no withholding tax on interest payments. Among the many positive effects of FDI for host countries, Pilip emphasized the partial local reinvestment of earnings.

The third session, chaired by Doris Ritzberger-Grünwald (OeNB), was devoted entirely to the implications of outward investment for investors' home countries. For decades, this topic has ranked high on the agenda in Western European countries and the United States but is now also gaining importance in classical FDI host countries in CEE, which are increasingly emerging as active investors in their neighboring countries.

Karolina Ekholm of the Stockholm School of Economics addressed public concerns about layoffs caused by outsourcing or offshoring domestic production to low-wage countries. According to these concerns, vertical FDI decreases labor demand in the investor's home country. This causes an increase in unemployment and puts downward pressure on wages, especially on those of less skilled workers. But studies on German and Swedish companies find that the effects of outsourcing to CEECs on domestic wages and employment are relatively small: A 10% increase in wages in CEECs actually boosts labor demand at parent firms by about 0.5% to 1%. The reason is that affiliate workers in low-wage countries are only a weak substitute for parent firms' workers in high-wage countries. The international division of labor may even increase the demand for high-skilled workers.

Marjan Svetlicic of the University of Ljubljana focused on the role of the new Member States as active investors. Currently, FDI outflows from these countries are still low, but they have experienced high growth in recent years. The major destinations of FDI from the NMS are locations in other NMS, given the narrow technological and cultural gap. Nevertheless, the net investment position of the NMS will remain negative over the medium term. Svetlicic pointed out that in the Slovenian case, outward FDI by domestic firms does not crowd out local investment. Firms that actively invest abroad clearly outperform firms that did not.

Priit Vahter of the University of Nottingham presented his research on the effects of both inward and outward FDI in the Estonian manufacturing sector.

He also explicitly tested for productivity spillovers of outward FDI on the Estonian service sector. Like productivity spillovers in host countries, such spillovers are caused by worker mobility or demonstration effects. Based on enterprise-level panel data of Estonian firms, Vahter finds positive direct effects of both inward and outward FDI on productivity, but only mixed evidence of externalities to the Estonian service sector.

The dinner speech on the first conference day was delivered by Jürgen Stark, Member of the Executive Board of the ECB. Stark focused on the challenges of euro area enlargement for the NMS, but also for the current euro area countries. He emphasized the importance of achieving a high degree of nominal, real and legal convergence before euro adoption. A major challenge for the new and old EU Member States is that fiscal and structural policies are under national responsibility but have to be treated as a matter of common concern, as omitted reforms in one country can have negative implications also for other countries. Structural reforms in labor markets should be targeted at facilitating wage adjustments that better reflect regional and sectoral productivity differences, while product market reforms should enhance innovation, ensure the efficient allocation of resources and contribute to creating a business-friendly environment.

In his opening remarks on the second day of the conference, OeNB Executive Director Josef Christl stressed the importance of FDI for economic growth and the catching-up process in the CESEE countries. Christl named three channels through which FDI can influence the economic performance of a country: First, FDI increases the capital stock of an economy, which, according to the standard neoclassical growth theory, should by itself lead to higher levels of per capita output. Second, FDI contributes to productivity growth, as foreign firms tend to have better technological know-how and managing skills. Third, FDI potentially entails a row of spillover effects also to local enterprises through labor mobility, imitation or training of suppliers. All these effects seem to be at work in CESEE and are likely to have contributed to the economic convergence process with Western Europe.

EBRD Chief Economist Erik Berglöf used the conference as an opportunity to present the main results of the EBRD Transition Report 2006. The overall picture drawn by the report is rather bright: Growth in 2006 is picking up in the CESEE and CIS countries. Convergence with Western Europe as well as within the region is actually taking place. The latest transition indicators point to a sustained reform momentum in 2006. A total of 24 transition score upgrades were awarded, almost half of them in the fields relating to financial institutions, and with most progress noted in Southeastern European (SEE) countries. Berglöf attributed the recently observed delay of euro adoption plans to a mixture of reform fatigue in the NMS and enlargement fatigue in the old EU Member States. The resulting uncertainty may be an obstacle for the formation of economic agents' expectations. Referring to the special topic of the 2006 report, "Finance in Transition," Berglöf considered the financial sector improvements in terms of size and complexity the most striking feature of transition. Foreign banks have contributed substantially to enhancing the stability and the efficiency of financial systems. Nevertheless, financial sectors

remain underdeveloped by Western standards and further institutional reforms are needed.

Erik Berglöf chaired a session that was entirely devoted to the effects of foreign direct investment on FDI host economies. The discussant of the session was Libor Krkoska from the EBRD. Jan Svejnar from the University of Michigan presented the results of a study on vertical and horizontal FDI spillovers in transition economies. The authors find a significantly positive impact of the presence of transnational corporations on total factor productivity only for large firms. This impact is stronger for firms with a larger share of workers with university education and thus a higher absorptive capacity. When it comes to vertical spillovers, foreign-owned firms provide backward productivity spillovers to domestic firms when they buy from them and forward spillovers when they sell to them. Svejnar finds evidence of backward spillovers both for smaller and larger firms. By contrast, there is no significant evidence of positive forward spillovers. Overall, the spillover effects seem to be independent of business environment factors such as corruption or bureaucracy.

Julia Wörz from The Vienna Institute for International Economic Studies (wiiw) investigated the impact of FDI on productivity growth on the basis of a sample of 35 OECD countries and emerging economies in CEE and East Asia. For catching-up economies, she finds a positive impact of FDI on productivity growth. This result matches well with the finding that the effect is stronger in labor- and resource-intensive industries (e.g. food or textile and wood sectors), which are more important at earlier stages of economic development. In these cases, FDI inflows are an important contributor to growth, in particular if combined with high domestic investment.

Based on these findings, Maria Silgoner from the OeNB investigated the nexus between FDI and wage growth in manufacturing industries in CEECs. Both domestic and foreign direct investment are found to be positively linked with wage growth. This appears to be in line with Wörz's evidence of the productivity-enhancing effects of FDI. But Silgoner also shows that foreign-owned companies tend to pay a wage premium to their employees to reduce work turnover. This factor is strongly limited by exposure to external competition, so that in very open sectors wage growth can at times even fall short of labor productivity growth.

Ksenia Yudaeva from the Centre for Strategic Research in Moscow investigated channels of spillover effects of FDI in Poland, Romania, Russia and Ukraine. She finds positive spillovers only in the case of export-oriented FDI. Spillovers are not limited to knowledge transfers – the exposure to foreign technologies alters the production function of domestic firms. This leads to higher capital intensity in more developed countries, such as Poland, and higher labor intensity in less developed countries, such as Russia. Both types of spillovers are stronger in regions with higher human capital endowment and less corruption.

The afternoon of the second conference day dealt with practical corporate FDI experiences in CEE. It started off with two introductory statements with a specific regional focus that may serve as a benchmark for CEECs. Frank Barry from the University College Dublin emphasized Ireland's success in attracting

FDI inflows over the last two decades as a key factor for its high growth performance. Today, Ireland's FDI per capita is as much as six times higher than the European average. Half of employment in manufacturing and a quarter of employment in services are in multinational firms. The language and the large Irish community in the U.S.A. are only two causes – several other factors are equally or even more important: the favorable investment climate after fiscal imbalances and labor market shortages had been sorted out in the 1980s; low corporate taxes; institutions that provided young people with the necessary science and engineering training; the growing influence of the Industrial Development Agency on government decisions; and the meritocratic orientation of public services. As a result, Ireland used EU regional aid more efficiently than Greece, Portugal or Spain.

The second regional focus was on Asia. Hui Tong from the Research Department of the IMF presented a paper coauthored with Barry Eichengreen in which he asked whether recent and increasing FDI flows to China were complementary to FDI in other countries or were rather crowding them out. The empirical results covering 29 source and 60 destination countries over the period between 1988 and 2003 suggest that FDI flows to China did not significantly influence FDI to other countries. There is evidence of some crowding out in OECD countries – largely because China is viewed as a large consumer market – but not in Latin America or in the CEECs. Asian countries that are part of China's production chain (e.g. Japan) experience beneficial effects on FDI, whereas countries that compete with China on the production of consumer goods (e.g. India or Pakistan) suffer from crowding-out effects.

The final panel discussion, chaired by OeNB Executive Director Peter Zöllner, was composed of leading representatives of multinational companies that are active investors in CESEE and are either headquartered in Austria or organize their expansion strategies in the region from an Austrian base. Austrian companies were among the first movers investing in the CEECs in the mid-1990s. As markets and investments in the NMS mature, Austrian companies are increasingly investing in countries in SEE and in the CIS.

The speakers agreed that the countries of Central, Eastern and Southeastern Europe are important markets at their doorstep, as they provide excellent opportunities to expand companies' market share. This argument often dominates even the common offshoring objective of cost reduction. Bigger market share in turn strengthens companies' competitiveness within Austria. In some cases, companies also follow their major customers or business partners, who are already active in that region. Overall, FDI is seen as a win-win situation for home and host countries, as Austrian firms and multinational enterprises contribute significantly to the economic development of the whole region. All speakers cited the diligent management of cultural differences and sufficiently skilled and trained employees as crucial for successful FDI.

The massive expansion of Siemens Austria AG into the region was achieved mainly through acquisition of newly privatized companies rather than greenfield investments, explained the company's CEO Brigitte Ederer. These FDIs were aimed partly at complementing the Siemens portfolio (i.e. manufacturing and software development centers) and partly at building up regional subsidiaries. The region's assets are low unit labor costs and a well-educated workforce.

Oliver Dillenz explained that OMV AG needed to grow in order to stay independent. As this cannot be ensured by the mature Austrian home market with its limited growth perspectives, OMV has invested EUR 1 billion to EUR 2 billion a year since 2003 in CESEE, and this trend will continue at least until 2010. The company's FDI policy pursues two strategies of vertical integration: utilizing the proximity to the growing markets for the downstream business, and securing future supply through a strong upstream position in six core regions around the world.

According to the representative of Zumtobel Lighting GmbH, Christian Schröder, the Eastern European luminaire market will stay small compared with that of Western Europe, but it offers significant growth potential both in terms of market share and increasingly sophisticated lighting solutions. Apart from its market share objective, Zumtobel strives to reduce its cost base by relocating one of its manufacturing units to Romania. Schröder stressed that training of future employees and continuing on-site support as well as a diligent involvement of local Romanian decision-makers will be a key factor for offshoring to succeed.

This is an insight around which DLA Piper, a global law firm, has built up its core competence. Stefan Eder, Regional Managing Partner of the CESEE arm of DLA Piper, is convinced that clients are best served through local offices and lawyers who are familiar with the cultural and legal environment. Therefore, DLA Piper has embarked on a strategy of being present in the market even before the customer arrives, thus anticipating the need of future clients to minimize (legal) risk.

Overall, the contributions to the panel discussion underpinned many findings of the theoretical literature. In some cases, however, the practitioners' view provided new insights that may shape future research.

5th Emerging Markets Workshop¹

Emerging Markets: Any Lessons for Southeastern Europe?

Suomen Pankki – Finland's Bank initiated a series of workshops dedicated to emerging market economies, the first of which was organized in Lapland in 2003. The 5th Emerging Markets Workshop was held at the OeNB on March 5 and 6, 2007. It attracted around 60 participants and concentrated on “Emerging Markets: Any Lessons for Southeastern Europe?” – a topic in line with the OeNB's research focus. Moreover, the two-day event was also dedicated to the memory of Olga Radzyner, former Head of the OeNB's Foreign Research Division, who would have celebrated her 50th birthday in 2007.

In his opening statement on the first day of the workshop, Peter Mooslechner (OeNB) pointed out that emerging Europe was of particular importance for Austria: In 2005, Austrian banks' assets in Central, Eastern and Southeastern Europe (CESEE) amounted to 16.1% of their total assets and to 35% of their pre-tax profits. The Austrian economy has benefited from Central and Eastern European (CEE) integration by a growth bonus of about 3½ percentage points in total since 1990. According to Mooslechner, some South Eastern European economies have not yet fully turned into emerging markets (Albania, Montenegro, Serbia), while others certainly qualify (Croatia, Bulgaria, Romania) and one has probably even passed beyond that stage (Slovenia). The main difference between European and non-European emerging markets is that European integration provides an economic and political anchor for most European emerging market economies (EMEs).

The first workshop session dealt with corporate sector issues including industrial restructuring and the role of foreign direct investment (FDI). Peter Havlik (Vienna Institute for International Economic Studies – wiiw) documented the rapid productivity growth in the New Member States (NMS) of the EU and in the Commonwealth of Independent States (CIS) arguing that this was largely a jobless growth as employment elasticity to GDP growth was very low. In the same session, Adam Geršl (Česká národní banka) reported mixed and thus somewhat disappointing evidence of productivity spillovers from FDI in the Central and Eastern European Countries (CEECs) during the last six to seven years. Evgeni Peev (University of Vienna) presented the main features of corporate financing in the NMS.

The second session focused on central bank and asset prices, in particular on central bank interventions and sterilization. Darko Bohnec (Banka Slovenije) and Marko Košak (University of Ljubljana) pointed out that some central banks had been relatively successful in opting for a managed floating exchange rate regime and had implemented adequate sterilization policies. In this respect, Banka Slovenije serves as a good example as it combines market-based instruments and capital controls with new instruments developed to compensate for underdeveloped financial markets and the lack of securities. Balázs Égert (OeNB) presented results based on the event study approach according to which – for a sample including Croatia, the Czech Republic, Hungary, Romania, Slovakia and Turkey – foreign exchange interventions

¹ The proceedings will be published in the OeNB's workshop series later in 2007.

alone were only effective in the short run but were more successful if coordinated with verbal interventions and interest news.

In his keynote speech Dimitri Demekas (IMF) illustrated that European emerging markets differed from other emerging markets for various reasons: They have undergone strong unconditional convergence, they have recorded important capital flows and current account deficits associated with growth. These developments, which can mainly be attributed to financial integration, to the prospect of EU accession and/or euro area membership and to threshold effects, mitigate the traditional risks of capital flow volatility and sudden stops. Although superficial international comparisons, by and large, miss the point, overvaluation and balance sheet risks are still present.

The third session on indebtedness and vulnerability dealt with public debt structure and foreign exchange exposure in emerging markets. Aitor Erce Dominguez (Banco de España) argued that looser international conditions would favor domestic debt restructuring. Similarly, domestic financial market deepening and issuance clustering would facilitate the financing of domestic debt on international markets. In her survey-based presentation Katalin Bodnár (Magyar Nemzeti Bank) illustrated that although the weakening of the Hungarian forint would have a negative impact on small and medium-sized enterprises (SMEs), many of these SMEs were not even aware of this fact. Moreover, they often lacked foreign exchange risk management tools, and two-thirds of domestic foreign exchange-denominated loans were not naturally hedged. Enrique Alberola (Banco de España) focused on the evolution of the public debt-to-GDP ratio and the share of foreign exchange debt, both of which have declined in emerging markets as a result of favorable financial conditions and authorities' proactive debt management strategies.

On the second day, the fourth workshop session examined banking sector issues such as banking sector restructuring and the ensuing credit expansion. Dubravko Mihaljek (Bank for International Settlements) presented a number of challenges connected to the presence of foreign banks. According to a survey, the quality of banking supervision in emerging markets increases with the presence of foreign banks. In this respect Mihaljek raised the following questions: What would happen if a foreign-owned bank that was important for the domestic banking system but of marginal interest for the parent company ran into difficulties? Who would rescue it? And how to deal with the effects of mergers of parent institutions on the domestic market? How should banking supervision react if domestic banks merged as a result of their foreign activities? Peter Backé (OeNB) compared today's CESEE with East Asia in 1997. By contrasting obvious similarities with striking differences, he illustrated that, overall, differences outweighed similarities, suggesting that CESEE has advantages over East Asia for the following reasons: First, CESEE's financing structures of current account deficits are more favorable. Second, the region's foreign debt is often financed by foreign parent companies. Third, CESEE's corporate sector leverage is lower, the maturity of its external debt is longer and its reserve coverage higher. Finally, its financial sectors are generally sound.

Reiner Martin (ECB) talked about the results of an event study examining 23 countries that had experienced boom-bust episodes. The findings for CEE

indicated that a boom was likely but that it was not clear what was to follow. Therefore, increased awareness of the associated policy challenges is needed and close monitoring will be necessary in some areas, such as external balances and balance sheet risks.

In the fifth session on exchange rates, Tuuli Juurikkala (Suomen Pankki – Finland's Bank) analyzed the real exchange rates of oil producing countries, showing that the Balassa-Samuelson effect was not a relevant factor for these countries. Furthermore, the elasticity of the real exchange rate with respect to real oil prices is usually quite close to 0.5. The oil price has a direct effect on the equilibrium exchange rates in oil-producing countries, over and above the possible effect stemming from higher per capita GDP.

Markus Pramor (Center for Financial Studies) examined co-movements of CEE and euro area exchange rate volatility against the dollar. According to his results, the Slovak koruna's long-term volatility is closest to that of the euro, whereas the Polish zloty is the least correlated currency. This study also highlighted the fact that the correlation of volatility developments between the euro area and the CEECs has increased over time.

Finally, Gunther Schnabl (University of Leipzig) elaborated on the effect of foreign exchange rate volatility on economic growth in Eastern Europe and East Asia, concluding that countries with fixed exchange rate regimes had grown faster than countries with flexible exchange rate regimes, which might be explained by the fact that fixed regimes promote trade and macroeconomic stability.

2nd Conference of the South East Europe Monetary History Network¹

The Experience of Exchange Rate Regimes in Southeastern Europe in a Historical and Comparative Perspective

The main objective of the South East Europe Monetary History Network (SEEMHN) is to spread the knowledge of Southeastern Europe's (SEE) economic history as an integral part of the European experience; the network focuses particularly on monetary and banking history and brings together economists and historians. As its first general meeting in Sofia in 2006 had been a great success and as participants and members had expressed their willingness to further advance the initiative, the OeNB decided to support the SEEMHN by hosting its second conference in Vienna on April 13, 2007. The meeting analyzed the exchange rate regimes in SEE from a historical and a comparative perspective.

Peter Mooslechner, Director of the OeNB's Economic Analysis and Research, opened the event by underlining the undiminished importance attached to choosing exchange rate regimes with regard to economic policy. This issue is particularly pertinent for small open economies (SMOPECs) such as (almost all) the SEE economies. Despite the fact that in Europe the overall perception regarding monetary policy has shifted to the notion of monetary union, it is still necessary to review and reflect different approaches. Luca Einaudi (Italian Prime Minister's Office) held the first keynote speech entitled "Early Monetary History, Mainly 1860s to 1920s: Efforts of Balkan States to Leave the Monetary Areas of the Ottoman Empire and the Austro-Hungarian Empire and to Move to Sovereign Currencies." Although these efforts to break away from the former empires were successful, the desire to rapidly modernize and catch up with the most advanced European nations unfortunately could not offset bleak economic and financial realities.

Chaired by Peter Mooslechner, the first session consisted of two presentations: Matthias Morys (University of Oxford) spoke about "Adjustment under the Classical Gold Standard (1870s–1914): How Costly did the External Constraint Come to the European Periphery and to South-Eastern Europe in Particular?" He contended that under the gold standard there might have been more room for economic policy maneuvers (also for peripheral economies) than scientists had previously thought. "Exchange Rate Control in Italy and Bulgaria in the Thirties. History and Perspectives" was the topic of a joint paper by Kalina Dimitrova and Nikolay Nenovsky (both from the Bulgarian National Bank) and Giovanni Pavanelli (University of Torino).

In the second session, which was chaired by Roumen Avramov (Centre for Liberal Strategies, Sofia), Erik Buyst (Katholieke Universiteit Leuven) and Ivo Maes (Nationale Bank van België/Banque Nationale de Belgique – NBB) talked about "Central Banking in 19th-Century Belgium: Was the NBB a Lender of Last Resort?" While they discovered that the NBB had rendered the Belgian financial system more crisis resistant, especially by restricting banking sector leverage, Buyst and Maes concluded that the NBB had not really functioned

¹ The proceedings of the conference will be published in the OeNB's workshop series later in 2007.

as a lender of last resort, as most rescue operations had taken place upon the explicit request of the finance minister. Martin Pontzen and Franziska Schobert (both from the Deutsche Bundesbank) discussed “Episodes in German Monetary History – Lessons for Transition Economies?” A dramatic episode of recent SEE monetary history was the subject of the presentation of Zorica Mladenović and Pavle Petrović (both from the University of Belgrade), who lectured on “Modelling Exchange Rate and Money Demand in Extreme Conditions: Econometric Analysis of the Daily Data from the Serbian Hyperinflation of 1992–1993.” The authors explained this hyperinflation, which, at an average monthly rate of 10,900%, was 34 times higher than the inflation rate recorded during the famous German hyperinflation of 1923 (322%), by forward-looking behavior combined with a need for seignorage.

Doris Ritzberger-Grünwald, Head of the OeNB’s Foreign Research Division, presided over the second keynote speech delivered by Peter Bernholz (University of Basel) on “General Patterns in the Monetary History of Balkan Countries in the 20th Century.” Bernholz focused on four episodes of hyperinflation SEE had seen since 1945, namely in Greece in the aftermath of World War II, in Yugoslavia between 1989 and 1990, in Serbia and Montenegro between 1992 and 1994, and in Bulgaria in 1997. These episodes share a number of qualitative characteristics that have been confirmed in other cases: At the beginning of the inflation, the real stock of money increases at a faster rate than the price level and the exchange rate. Later, the dynamics reverse, leading to undervaluation, which is only overcome once monetary stabilization has been undertaken.

The third session was chaired by Sophia Lazaretou (Bank of Greece). Kalina Dimitrova (Bulgarian National Bank), Martin Ivanov (Bulgarian Academy of Sciences) and Ralitsa Simeonova-Ganeva (St. Kliment Ohridski University, Sofia) analyzed the impact of “Effective Exchange Rates in Bulgaria 1897–1939.” Their lecture was followed by Biljana Stojanović (Megatrend University, Belgrade), who discussed “Exchange Rate Regimes of the Dinar 1945–90. Assessment of Appropriateness and Efficiency.” Given that in former socialist Yugoslavia ideological and legal frameworks were conducive to persistent monetary expansion, the weakening of the Yugoslav currency was inevitable whatever the officially applied exchange rate regime. Elisabeta Blejan (Banca Națională a României) analyzed “The Foreign Exchange Regime in Romania 1929–1939,” followed by Yury Goland (Russian Academy of Sciences) who presented “Discussions over the Exchange Rate in the Period of NEP (1921–1928).”

The fourth and final session was chaired by Nikolay Nenovsky (Bulgarian National Bank) and featured Yüksel Görmez (Türkiye Cumhuriyet Merkez Bankası) lecturing on “The Evolution of Exchange Rate Regime Choice in Turkey.” Turkey appears to have tried various kinds of exchange rate regimes, ranging from strictly fixed to free float regimes. In the past – contrary to the current situation – experimental regime choice was common practice against the background of structural imbalances, ever increasing dollarization and the lack of fiscal discipline coupled with central bank financing of public deficits through short-term advances. Ljiljana Đurđević and Milan Šojić (both from Narodna banka Srbije) focused on “Dinar Exchange Rate in the Kingdom

of Serbia 1882–1914.” Finally, Dragana Gnjatović (Megatrend University, Belgrade) expounded her analysis of “Foreign Exchange Policy in the Kingdom of Yugoslavia during and after Great Depression.”

The conference was wrapped up by Sophia Lazaretou, Peter Mooslechner and Nikolay Nenovsky. Lazaretou announced that the next SEEMHN conference would focus on “Commercial and Central Banking in the Southeastern European Periphery: Lessons of Historical Experience” and would be held at the Bank of Greece in Athens in about a year. Nenovsky thanked Mooslechner for organizing the Vienna conference, which the latter concluded by pointing to many further interesting research issues and by stressing that in this respect it was important to continue collecting more historical data.

Olga Radzyner Award for Scientific Work on European Economic Integration

The Oesterreichische Nationalbank 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. In 2007, four applicants are eligible to receive a single payment of EUR 3,000 each from an annual total of EUR 12,000.

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 35th birthday and shall be citizens of any of the following countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Montenegro, Poland, the Republic of Macedonia, Romania, Serbia, 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, 1011 Vienna, Austria. The Oesterreichische Nationalbank shall receive the work submitted for the award in 2007 by October 3, 2007, 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) or by phone (+43-1-40420-5205).

STATISTICAL ANNEX

Statistical Annex

Table A1

Gross Domestic Product

Annual real change in %	2000	2001	2002	2003	2004	2005	2006
Albania	6.5	7.1	4.3	5.8	6.2	5.6	4.8
Bosnia and Herzegovina	5.5	4.5	5.5	3.0	6.0	5.5	5.3
Republic of Macedonia	4.5	-4.5	0.9	2.8	4.1	3.8	3.2
Serbia	4.5	4.8	4.2	2.5	8.4	6.2	5.8
Montenegro	x	-0.2	1.7	2.4	4.2	4.3	4.5
Ukraine	5.9	9.2	5.2	9.6	12.1	2.6	7.1

Source: wiiv, national sources.

Table A2

Industrial Production

Annual real change in %	2000	2001	2002	2003	2004	2005	2006
Albania	1.3	6.1	-5.1	29.0	14.1	1.3	1.5
Bosnia and Herzegovina	7.9	4.9	5.7	5.1	12.1	10.8	11.5
Republic of Macedonia	3.0	-2.9	-4.8	4.1	-2.2	7.1	2.5
Serbia	11.4	0.1	1.8	-3.0	7.1	0.8	4.7
Montenegro	4.2	-0.7	0.6	2.4	13.8	-1.9	1.0
Ukraine	13.2	14.3	7.0	15.8	12.5	3.1	6.2

Source: wiiv, national sources.

Table A3

Average Gross Wages

Annual change in %	2000	2001	2002	2003	2004	2005	2006
Albania	17.7	15.1	14.2	8.5	14.4	9.9	4.1
Bosnia and Herzegovina ¹	7.2	10.9	10.4	8.6	4.3	6.7	9.5
Republic of Macedonia	x	-0.4	6.4	4.9	4.1	2.7	8.0
Serbia	90.7	128.8	52.6	25.3	23.7	24.1	24.4
Montenegro	x	16.8	42.6	7.8	11.7	7.8	15.6
Ukraine	30.2	34.9	20.7	23.0	27.7	36.5	29.4

Source: wiiv, national sources.

¹ Net wages.

Table A4

Unemployment Rate

End of period, %	2000	2001	2002	2003	2004	2005	2006
Albania ¹	16.8	16.4	15.8	15.0	14.4	14.2	13.9
Bosnia and Herzegovina ¹	39.7	40.3	40.9	42.0	43.2	44.2	31.1
Republic of Macedonia ²	32.2	30.5	31.9	36.7	37.2	37.3	36.0
Serbia ²	12.1	12.2	13.3	14.6	18.5	20.8	20.9
Montenegro ²	19.3	23.7	20.7	x	27.7	30.3	30.0
Ukraine ²	11.6	10.9	9.6	9.1	8.6	7.2	6.8

Source: wiiv.

¹ Registered, end of period.

² LFS, period average.

Table A5

Industrial Producer Price Index

Period average, annual change in %

	2000	2001	2002	2003	2004	2005	2006
Albania ¹	6.5	-7.2	5.1	1.8	12.2	4.9	0.7
Bosnia and Herzegovina	-0.1	3.9	-0.3	-0.1	2.3	-0.4	3.5
Republic of Macedonia	10.7	2.0	-0.9	-0.3	0.9	3.2	4.5
Serbia	102.6	87.7	8.8	4.6	9.1	14.2	13.3
Montenegro	x	x	14.5	4.5	5.8	2.1	2.0
Ukraine	20.9	8.6	3.1	7.8	20.4	16.8	9.5

Source: wiw, national sources.

¹ Manufacturing industry.

Table A6

Consumer Price Index

Period average, annual change in %

	2000	2001	2002	2003	2004	2005	2006
Albania	0.1	3.1	5.2	2.2	3.0	2.4	2.4
Bosnia and Herzegovina	4.9	3.2	1.3	1.1	0.7	2.9	7.4
Republic of Macedonia	5.8	5.5	1.8	1.2	-0.4	0.5	3.2
Serbia	79.6	93.3	16.6	9.9	11.4	16.2	11.6
Montenegro	20.2	21.8	16.0	6.7	2.4	2.3	3.0
Ukraine	28.2	12.0	0.8	5.2	9.0	13.5	9.1

Source: wiw.

Table A7

Trade Balance

% of annual GDP

	2000	2001	2002	2003	2004	2005	2006
Albania	-22.3	-25.0	-25.9	-25.1	-21.7	-24.0	-23.4
Bosnia and Herzegovina	-53.8	-93.7	-54.5	-53.9	-49.1	-49.7	-37.2
Republic of Macedonia	-19.2	-15.3	-21.3	-18.3	-20.7	-18.3	-20.7
Serbia	-6.5	-19.5	-20.4	-19.8	-26.4	-20.2	-19.5
Montenegro	x	-39.2	-32.6	-25.8	-26.6	-30.4	-51.5
Ukraine	2.5	0.5	1.7	1.0	5.8	-1.4	-4.9

Source: wiw, European Commission.

Table A8

Current Account Balance

% of annual GDP

	2000	2001	2002	2003	2004	2005	2006
Albania	-4.4	-5.3	-7.2	-5.3	-3.9	-6.5	-5.9
Bosnia and Herzegovina	-7.8	-14.1	-19.1	-20.9	-19.2	-21.3	-11.5
Republic of Macedonia	-2.0	-7.1	-9.5	-3.2	-7.7	-1.4	-0.4
Serbia	-0.6	-2.4	-7.9	-7.0	-11.7	-8.5	-11.4
Montenegro	x	-15.7	-12.6	-7.3	-7.6	-9.1	-32.3
Ukraine	4.8	3.8	7.3	5.7	10.6	3.0	-1.5

Source: wiw, European Commission.

Table A9

Net Foreign Direct Investment

% of annual GDP

	2000	2001	2002	2003	2004	2005	2006
Albania	3.9	5.0	3.0	3.1	4.6	3.4	3.4
Bosnia and Herzegovina	2.9	2.2	4.3	4.9	7.1	5.2	3.7
Republic of Macedonia	4.9	12.8	2.1	2.0	2.9	1.7	5.6
Serbia	0.2	1.4	3.0	6.7	3.9	5.9	13.7
Montenegro	x	0.9	6.9	2.8	3.2	22.6	26.5
Ukraine	1.9	2.0	1.6	2.8	2.6	9.1	5.0

Source: wiiv.

Table A10

Reserve Assets Excluding Gold

End of period, % of annual GDP

	2000	2001	2002	2003	2004	2005	2006
Albania	16.7	18.1	18.8	18.0	18.5	17.1	18.5
Bosnia and Herzegovina	10.5	24.4	23.6	25.3	28.1	27.0	33.9
Republic of Macedonia	12.0	21.7	19.0	19.4	16.9	21.9	28.8
Serbia	7.0	9.5	14.2	17.3	18.3	25.0	36.1
Montenegro	x	x	x	x	x	x	x
Ukraine	4.3	7.9	9.2	12.2	13.1	24.0	19.7

Source: wiiv, IMF.

Table A11

Gross External Debt

End of period, % of annual GDP

	2000	2001	2002	2003	2004	2005	2006
Albania	31.4	28.5	24.9	21.9	20.7	20.7	20.1
Bosnia and Herzegovina ¹	37.9	38.1	33.4	29.9	27.5	27.5	24.2
Republic of Macedonia	42.7	44.2	39.3	35.9	35.3	41.6	37.3
Serbia	44.1	95.6	64.1	60.3	52.5	61.9	58.5
Montenegro	x	x	68.7	33.2	31.2	30.4	35.8
Ukraine	37.7	32.5	27.3	42.9	43.1	50.4	48.7

Source: wiiv.

¹ Gross external public debt.

Table A12

General Government Balance

% of GDP

	2000	2001	2002	2003	2004	2005	2006
Albania	-7.5	-6.8	-6.6	-4.5	-5.1	-3.6	-3.2
Bosnia and Herzegovina	-6.5	-3.3	-3.3	-2.0	-0.4	0.9	0.7
Republic of Macedonia	2.3	-6.3	-5.6	-1.1	0.0	0.3	-0.6
Serbia	-1.0	-4.9	-3.1	-1.1	0.9	1.9	1.6
Montenegro	-6.9	-4.0	-3.8	-1.9	-2.6	-2.8	1.2
Ukraine	0.6	-0.3	0.7	-0.2	-3.2	-1.8	-0.7

Source: European Commission, wiiv.

Table A13

Gross General Government Debt

% of annual GDP

	2000	2001	2002	2003	2004	2005	2006
Albania	71.1	66.6	65.3	61.7	56.6	56.7	55.7
Bosnia and Herzegovina	x	x	33.9	30.1	27.5	27.2	..
Republic of Macedonia	53.2	51.6	48.7	45.0	43.8	48.5	41.0
Serbia	x	x	80.6	70.9	56.7	52.9	34.9
Montenegro	x	x	88.3	51.1	47.4	41.4	38.3
Ukraine	45.9	36.9	33.5	29.0	25.9	22.8	..

Source: EBRD, European Commission.

Table A14

Broad Money

End of period, annual nominal change in %

	2000	2001	2002	2003	2004	2005	2006
Albania (M3)	12.0	13.1	12.2	7.6	8.2	11.7	7.6
Bosnia and Herzegovina (M2)	14.0	31.4	66.7	4.8	19.9	18.7	21.6
Republic of Macedonia	24.5	61.7	37.0	8.0	19.2	16.7	24.8
Serbia (M2)	58.5	67.6	73.4	27.5	30.3	43.2	39.9
Montenegro (M2)	x	x	x	x	11.4	40.5	54.4
Ukraine	46.1	41.9	41.8	46.5	32.4	54.3	34.5

Source: European Commission, wiiv.

Table A15

Official Key Interest Rate

End of period, %

	2000	2001	2002	2003	2004	2005	2006
Albania (refinancing base rate)	10.8	7.0	8.5	6.5	5.3	5.0	5.5
Bosnia and Herzegovina ¹	x	x	x	x	x	x	x
Republic of Macedonia (discount rate)	7.90	10.70	10.70	6.50	6.50	6.50	6.50
Serbia (discount rate)	26.34	16.43	9.50	9.00	8.50	8.50	8.50
Montenegro ²	x	x	x	x	x	x	x
Ukraine (refinancing rate) ³	29.00	12.50	7.00	7.00	9.00	9.50	8.50

Source: Eurostat, Bloomberg, wiiv, IMF.

¹ Currency board.² Unilateral euroization.³ Average.

Table A16

Exchange Rate

Period average, national currency per EUR

	2000	2001	2002	2003	2004	2005	2006
Albania	132.58	128.47	132.36	137.51	127.67	124.19	123.08
Bosnia and Herzegovina	1.96	1.96	1.96	1.96	1.96	1.96	1.96
Republic of Macedonia	60.73	60.91	60.98	61.26	61.34	61.30	61.19
Serbia	15.04	59.46	60.68	65.05	72.57	82.91	84.06
Montenegro	x	x	x	x	x	x	x
Ukraine	5.03	4.81	5.03	6.02	6.61	6.39	6.34

Source: 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

ATS	Austrian schilling
BGN	Bulgarian lev
BIS	Bank for International Settlements
BNB	Bulgarian National Bank
BNR	Banca Națională a României
BS	Banka Slovenije
CAR	capital adequacy ratio
CBBH	Centralna banka Bosne e Hercegovine (Central Bank of Bosnia and Herzegovina)
CBCG	Centralna banka Crne Gore (Central Bank of Montenegro)
CBI	central bank independence
CBR	Central Bank of Russia
CEE	Central and Eastern Europe(an)
CEECs	Central and Eastern European countries
CEEI	Conference on European Economic Integration (OeNB)
CESEE	Central, Eastern and Southeastern Europe(an)
CIS	Commonwealth of Independent States
ČNB	Česka národní banka
CPI	consumer price index
CZK	Czech koruna
DEM	German mark
DOLS	dynamic ordinary least squares
EBRD	European Bank for Reconstruction and Development
EC	European Commission
ECB	European Central Bank
Ecofin	Council of Economic and Finance Ministers
EDP	excessive deficit procedure
EIB	European Investment Bank
EME	emerging market economies
EMU	Economic and Monetary Union
ERM (II)	exchange rate mechanism (II)
ESA	European System of Accounts
ESCB	European System of Central Banks
EU	European Union
EUR	euro
FDI	foreign direct investment
GDP	gross domestic product

GFCF	gross fixed capital formation
GFS	government finance statistics
HICP	Harmonised Index of Consumer Prices
HNB	Hrvatska narodna banka (Croatian National Bank)
HRK	Croatian kuna
HUF	Hungarian forint
IAS	International Accounting Standards
ICTY	International Criminal Tribunal for the Former Yugoslavia
IFS	international financial statistics (IMF)
ILO	International Labor Organization
IMF	International Monetary Fund
KLR	Kaminsky, Lizondo and Reinhart approach (to predicting currency crises)
LFS	Labor Force Survey
MNB	Magyar Nemzeti Bank
MPI	Market Pressure Index
NBB	Nationale Bank van België (Banque Nationale de Belgique)
NBER	National Bureau of Economic Research
NBP	Narodowy Bank Polski
NBRM	Narodna banka na Republika Makedonija (National Bank of the Republic of Macedonia)
NBS	Národná banka Slovenska
NBS	Narodna banka Srbije
NBU	National Bank of Ukraine
NCB	national central bank
NMS	new Member State(s) (EU)
NPL	nonperforming loan
OECD	Organisation for Economic Co-operation and Development
OeNB	Oesterreichische Nationalbank
OLS	ordinary least squares
OSCE	Organization for Security and Co-operation in Europe
OSF	Oil Stabilization Fund
PLN	Polish złoty
PPI	producer price index
PPP	purchasing power parity
ROE	return on equity
RON	Romanian leu
RSD	Serbian dinar
RUB	Russian ruble
SAA	Stabilisation and Association Agreement
SDR	Special Drawing Right
SEE	Southeastern Europe(an)
SEEMHN	South East Europe Monetary History Network
SFR	Swiss franc
SGP	Stability and Growth Pact
SIT	Slovenian tolar
SKK	Slovak koruna
SME(s)	small and medium-sized enterprise(s)

SMOPEC(s)	small open economy
TCMB	Türkiye Cumhuriyet Merkez Bankası (Central Bank of the Republic of Turkey)
TRY	Turkish lira
UIP	uncovered interest parity
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

AL	Albania	LU	Luxembourg
AT	Austria	LV	Latvia
BA	Bosnia and Herzegovina	MD	Republic of Moldova
BE	Belgium	ME	Montenegro
BG	Bulgaria	MK	(Former Yugoslav) Republic of Macedonia
BY	Belarus	MT	Malta
CY	Cyprus	NL	Netherlands
CZ	Czech Republic	NO	Norway
DE	Germany	PL	Poland
DK	Denmark	PT	Portugal
EE	Estonia	RO	Romania
ES	Spain	RS	Serbia
FI	Finland	RU	Russian Federation
FR	France	SE	Sweden
GR	Greece	SI	Slovenia
HR	Croatia	SK	Slovakia
HU	Hungary	TR	Turkey
IE	Ireland	UA	Ukraine
IT	Italy	UK	United Kingdom
KZ	Kazakhstan	US	U.S.A.
LT	Lithuania		

Definitions

Croatia, the Republic of Macedonia and Turkey are candidate countries within the EU enlargement process. Candidate countries are countries which have formally applied to the European Union for membership and have been officially recognized by the European Council as a candidate for membership. Accession negotiations with Croatia and Turkey were opened in October 2005. No date has been set yet for the opening of accession negotiations with the Republic of Macedonia.

Albania, Bosnia and Herzegovina, Montenegro and Serbia are potential EU candidate countries, i. e. countries that will become an integral part of the EU once they meet the established criteria. Western Balkan countries involved in the Stabilisation and Accession process are recognized as potential candidate countries.

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three to four issues a year

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annual

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annual

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