OESTERREICHISCHE NATIONALBANK

Eurosystem

FINANCIAL STABILITY REPORT

13

June 2007

Stability and Security.

The OeNB's biannual *Financial Stability Report* provides regular analyses of Austrian and international developments with an impact on financial stability. In addition, it includes studies offering in-depth insights into specific topics related to financial stability.

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Imprint

Publisher and editor:
Oesterreichische Nationalbank
Otto-Wagner-Platz 3, AT 1090 Vienna
Günther Thonabauer, Communications Division
Internet: www.oenb.at
Printed by: Oesterreichische Nationalbank, 1090 Vienna, Austria

DVR 0031577

Vienna, 2007

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Framework Conditions for the Austrian Financial System Remain Favorable

Strong Economic Activity in the Industrialized Countries

The economies of the industrialized countries continued to expand at a robust pace in early 2007, with the exception of the U.S., where the real estate sector as well as certain industrial subsectors, in particular, showed signs of cooling off. In the euro area, by contrast, economic growth – which has been increasingly driven by domestic demand – remained dynamic. In the particularly volatile crude oil market, prices rebounded in the months after January 2007, following a period of decline.

In 2006, the economies of Central, Eastern and Southeastern Europe (CESEE), which are becoming more and more important for Austrian enterprises and banks, expanded at growth rates that surpassed those observed in the euro area. Several countries in the region built up substantial external imbalances, but were able to finance them by direct investments in most cases. Next to robust economic activity, most countries recorded high – sometimes even rising – credit growth rates, with foreign currency loans remaining widely popular with customers.

Rising Interest Rates in International Financial Markets

Cyclical dynamics together with the ECB's interest rate hikes contributed to an uptrend in short- and long-term interest rates in the euro area. Term premia remained low by historical comparison, but continued to be positive (contrary to those in the U.S.). Risk premia on corporate bonds relative to government bonds of similar maturity remained historically low, with risk premia on bonds in CESEE even recording a decline.

The favorable economic developments also supported prices at international stock exchanges, which – aside from short periods of falling stock prices and higher volatility – have recorded further gains since the fall of 2006. In this environment, the Austrian Traded Index (ATX) also continued its upward trend in the first few months of 2007.

Capital Markets Gain Importance for Domestic Enterprises and Households

Developments in the Austrian economy remained highly dynamic. Corporate profits continued to augment in 2006, which not only improved enterprises' internal financing potential but – together with higher external equity financing – also strengthened the corporate sector's capital position further. In the second half of 2006, external corporate financing mainly took place on the capital market, although (euro-denominated) bank loans also began to pick up again.

Capital market instruments not only played a dominant role in corporate financing, but also in household investments. In total, stocks, bonds and mutual funds accounted for significantly more than one quarter of households' financial assets at the end of 2006. While direct investment in stocks and bonds predominantly concentrated on Austrian or euro area issuers, stocks and bonds issued outside the euro area play a clearly more important role in indirect investment via mutual funds. The share of mutual funds in financial investment declined

in 2006, however, while structured products attracted more investors.

At the same time, rising interest rates and lending volumes drove up the interest payment burden of nonfinancial enterprises and households. Unlike enterprises, households have not substantially reduced their foreign currency borrowing so far, which means that household financing continues to be subject to significant currency risks.

Austrian Banks' Risk Capacity Remains High

In 2006, profits generated by Austrian banks continued to rise. Their increase was largely attributable to the results Austrian banking groups recorded in Central and Eastern Europe (CEE) and which accounted for 38,7% of overall results in 2006. Hence, business in CEE has become even more important for Austrian banks, in particular as profit growth in Austria slowed down in 2006 after a period of robust growth in 2005 and 2004. The main reasons behind domestic developments were the further narrowing of the interest margin as well as rising staff costs, which reflect an expansion of staff resources (not least in connection with the expansion of activities in CEE). The (unconsolidated) cost-to-income ratio, which had reached a historic low in the previous year, went slightly up again.

Given the favorable economic environment, banks have been arriving at increasingly positive assessments of credit risk. Even if banks lately recorded a slight decline in foreign currency loans (in particular to enterprises), these loans continue to be of major importance and thus constitute a significant source of risk. Moreover, Austrian credit institutions' foreign currency lending is not only restricted to domestic borrowers; rather, Austrian banks (or their subsidiaries) have granted considerable volumes of foreign currency loans to borrowers in CEE.

Overall, Austrian banks' risk-bearing capacity continues to be high and their capital ratio remains adequate. Moreover, stress tests show that the Austrian banking system's resilience to shocks is satisfactory.

Although the favorable macroeconomic environment supported the performance of insurance companies and mutual funds, their growth dynamics has slowed down against previous years. Given the increasing demand for personal pension plans and the favorable economic environment, the overall outlook remains positive.

International Environment Continues to be Favorable in General, but Risk Factors Remain

Industrialized Countries: Robust Growth, Temporarily Higher Volatility on Financial Markets

Robust Growth and Greater Balance across Regions

In the *industrialized countries* economic growth has remained robust. In the euro area economic growth continued to strengthen, while it weakened in the United States. The crude oil market experienced higher price volatility: As of August 2006, the price of crude oil dropped significantly, hovering around 50 USD on some days in January. By mid-April 2007 it had recovered to over 65 USD. At any rate, the futures markets for crude oil suggest that crude oil prices will stay high. Short- and long-term interest rates rose slightly during the period under review, with long-term forward rates remaining historically low.

In the *United States,* real GDP growth, which had already been much less dynamic in the preceding quarters, continued to weaken during the first quarter of 2007. So far, the economic slowdown has mainly affected the real estate sector and certain industrial subsectors. Thanks to the job market situation and to significantly lower crude oil prices, consumer spending remained robust. However, declining real estate investment and weak business spending dampened economic growth. During the period under review banks tightened their credit terms for mortgage loans to borrowers with low creditworthiness. Core inflation remained at a slightly higher level. While the Federal Reserve System expects inflation to slow down, there is the risk that the full resource utilization in the U.S. economy could prolong the upward pressure on inflation. Economic growth in the United States is likely to slow down more significantly than anticipated in the fall. However, most forecasts currently predict an early recovery. The IMF expects economic growth to reach 2.8% in 2008.

Euro area growth continued to be dynamic in the last quarter of 2006 and also in the first quarter of 2007, which means that most growth forecasts were outperformed. During this period, the employment market saw increasing employment and shrinking unemployment rates. HICP inflation declined, mainly owing to base effects in energy prices. Between the beginning of October 2006 and the end of March 2007, the Governing

Table 1

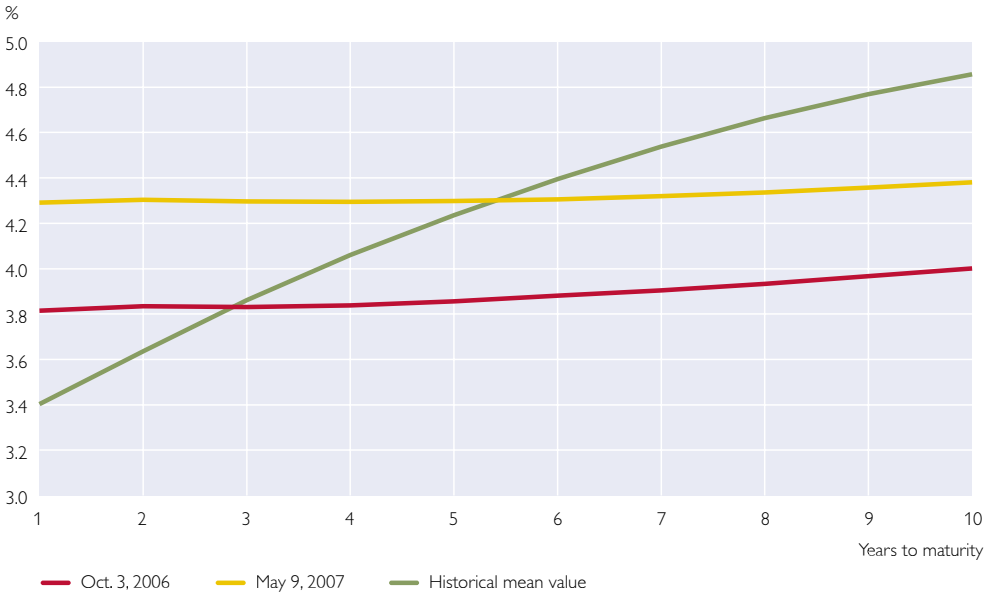
IMF Economic Forecasts of September 2006 and April 2007

	GDP growth (%, year on year)			Consumer price inflation (%)		
	2007		2008	2007		2008
	Sep. 06	Apr. 07	Apr. 07	Sep. 06	Apr. 07	Apr. 07
Industrialized countries	2.7	2.5	2.7	2.3	1.8	2.1
U.S.A.	2.9	2.2	2.8	2.9	1.9	2.5
Euro area	2.0	2.3	2.3	2.4	2.0	2.0
Japan	2.1	2.3	1.9	0.7	0.3	0.8

Source: IMF (World Economic Outlook).

Chart 1

Yield Curve Remains Flat but Shifts Upward



Source: Thomson Financial, OeNB, based on interest rate swaps.

Council of the ECB raised the ECB's key interest rate by another 75 basis points; the Governing Council continued to see upward risks to price stability at the beginning of April. The IMF expects the favorable economic developments to continue until 2008 and inflation to stay at 2%.

In *Japan,* the economy continued to grow in the last few quarters, while core inflation remained near zero (mostly because a new calculation method was used). Both the Bank of Japan and the IMF expect economic growth to remain moderate and medium-term inflation to continue its slight upward trend.

Temporary Turmoil in the Financial Markets, Interest Rates Rise in the Euro Area and in Switzerland

On the U.S. *money markets,* the Federal Reserve System held its key interest rate at a steady 5¼% from the beginning of October 2006 until mid-May 2007. Over the same period, the ECB and the Bank of Japan raised their key interest rates by 75 and 25 basis points to 3.75% and 0.5%, respectively. The Swiss central bank increased its key interest rate by 50 basis points. In mid-May its target range for the three-month Libor for the Swiss franc was between 1.75% and 2.75%. The central banks of a number of other industrialized countries also continued to raise their key interest rates. While key interest rate hikes in the euro area and in Japan had been anticipated in the money markets, the expectations some market participants had of falling key interest rates in the United States did not materialize. In mid-April, money market forward rates suggested that market participants did not agree on whether the U.S. key interest rate would be lowered by the end of September. For the euro area, Japan and Switzerland, by contrast, market participants expected short-term interest rates to go up.

The U.S. *capital market yield curve* remained largely unchanged and maintained its inverted shape for maturities of up to three years. In the euro area, interest rates across the entire maturity spectrum went up by about 50 basis points, presumably because of the ECB key interest rate hikes and the stronger than expected economic activity. In Switzerland, interest rates rose for all maturities as well albeit at a more moderate rate than in the euro area. In all three currencies, term premia were considerably below the long-term average in mid-April. Measured against the results of Consensus Forecasts, long-term inflation expectations remained stable in the euro area and slightly decreased in the U.S.A. and in Switzerland.

In the period under review *risk premia on corporate bonds* of highly creditworthy borrowers in the euro area remained broadly unchanged. Risk premia for less creditworthy issuers continued to decrease considerably until end-February, when they rebounded quickly during turmoils in the financial markets. Subsequently, they maintained their higher level until mid-April. However, in a long-term comparison, risk spreads remained low, mainly because companies made excellent profits and improved their balance sheets. Swap spreads in the euro area increased slightly as well at the end of February.

The upward trend on U.S. *stock markets* slowed down as of fall 2006, while euro area stock markets continued to record price gains. One of the reasons for these unequal trends lies in the different economic developments in these two economic areas. At the end of February 2007, a broad market correction caused stock prices to decrease rapidly and substantially. Uncertainty, as measured by the implied volatility of options, rose significantly, both on the stock and on the money and foreign exchange markets. The slump in prices was attributed to higher risk aversion caused by concerns about (1) developments in the U.S. economy and the U.S. mortgage market, (2) the high volume of carry trades (i.e. borrowing in low-interest currencies for speculative purposes, in particular for investment in higher-yielding currencies) and (3) the further development of the Japanese yen, as well as to the pronounced stock price decline in the Chinese stock market. Markets stabilized again after a few days. Stock prices rebounded and implied volatility receded and, in mid-April, reached more or less the level it had recorded in the preceding months, which was low in a long-term comparison. The price-to-earnings ratios in the United States and in the euro area went up slightly in the past quarters and are now close to their historical mean values.

In the *foreign exchange markets,* the euro appreciated markedly against the U.S. dollar, reaching the highest level since its introduction in January 1999 at a rate of USD 1.3649 per euro on April 25, 2007. The common currency appreciated even more strongly against the Japanese yen and the Swiss franc, reaching historical highs at JPY 161.91 and CHF 1.6467 per euro, respectively. These gains were partly caused by the relatively stronger rise of euro area interest rates across the entire maturity spectrum. In the course of the financial market turmoil at the end of February, during which the U.S. dollar came under pressure, the exchange rates of the euro against the Japanese yen and the Swiss franc were consid-

erably volatile, which caused a temporary, significant appreciation of these two currencies against the euro. This temporary strengthening of the Swiss franc and the Japanese yen was generally considered to be attributable to stronger risk aversion, which had prompted some investors to discontinue carry trade investments.

Emerging Markets: Dynamic Growth, Inflows to the Private Sector

Continued Strong Growth and Predominantly High Current Account Surpluses

According to the IMF, dynamic economic developments in the *emerging market economies (EMEs)* will continue. The IMF once again significantly upgraded its growth projections for several EMEs, in particular for the CIS countries (except Russia), for Brazil, India and for sub-Saharan Africa. For 2007 and 2008, the IMF predicts an annual real GDP growth of 7% for the EMEs, after almost 8% in 2006. Inflation, which has been slightly decreasing, is expected to fall below 5% by 2008. The turmoils in the global financial markets in late spring 2006 and in February 2007 had no permanent impact on growth prospects. This can above all be attributed to sound fundamentals in the EMEs: Most EMEs hold large current account surpluses and have stabilized their public finances, reduced their debt burden ratios and stepped up their currency reserves. For these countries, further interest rate hikes in the developed economies are considered a risk, as this might prompt international investors to reconsider risk-taking.

In *non-Japan Asia (NJA),* real GDP growth accelerated slightly to 8.9% in 2006, although some of the large economies experienced a minor slowdown in the second half of the year. Both the domestic economy and the external sector continued to be major pillars of growth. While India's economy kept booming at a rate of 9.2%, the rate of economic growth in China went up slightly to 10.7%, driven by dynamic capital investments and exports. The People's Bank of China raised its key interest rates three times within a year, tightened administrative controls and repeatedly stepped up the minimum reserve requirements for deposits to dampen credit growth. According to the IMF, economic perspectives in NJA remain bright, even if growth rates will presumably ease down to 8.0% until 2008. A stronger economic downturn in the U.S.A. might pose a risk to exports in the region.

In *Latin America,* the economy grew by 5.5% in 2006, with significant differences between the individual countries. The IMF expects broadly based growth to moderately slow down to 4.2% in 2008 in the entire region, while growth in Brazil is expected to accelerate to this value. According to the IMF, structural reforms in several countries within the region have reduced their vulnerability to external shocks. Supportive financing conditions and continually high commodity prices enhance the positive outlook, although Latin America would be affected more severely by a slowdown in the U.S. economy than other regions.

In *sub-Saharan Africa,* economic growth was dynamic at 5.7% in 2006, with oil importing countries growing by 5.3%. After an acceleration to 6.8% in 2007, the IMF expects economic growth to slow down slightly to 6.1% in 2008. The frequency of military conflicts and the extent of

political instability in the region clearly declined over the last ten years. Therefore, a prolongation of economic growth now depends mainly on economic policies: structural reforms, a strengthening of institutions and a better investment climate may help reduce the strong dependence on commodities. According to the IMF, expenditures for infrastructure, education and health (based on oil profits and debt reliefs) need to be stepped up, but with a view to maintaining economic stability as a whole. The IMF calls on the developed economies to live up to their (financial) commitments in the area of development cooperation and to open up their markets to African exports to support economic growth in Africa.

In the *Middle East,* the IMF expects growth rates to remain stable around 5.5% until 2008. According to the IMF, the oil exporting countries have managed to improve their infrastructure, with a particular focus on further developing the non-oil sector. The IMF believes that careful management of the high oil revenues accrued during the current commodity boom has reduced the vulnerability to price drops. Although the stability of financial institutions is improving because of continued financial market reforms, financial institutions in several countries are left with a large number of problem loans.

In *Turkey,* growth slowed down further to 6.1% in 2006, as domestic demand declined in the second half of the year, partly owing to a restrictive monetary policy stance following the depreciation in spring 2006 and weaker credit growth. With inflation hovering at 9.7% in December, the central bank failed to meet the target rate set at the beginning of 2006. Nevertheless, Türkiye Cumhuriyet Merkez Bankası stands by its medium-term inflation target of 4% (+/–2%). In spite of the depreciation, the current account deficit, which climbed to 8% of GDP in 2006, is expected to decrease only moderately. Most recently, the deficit was financed through soaring net inflows of direct investment, which were primarily driven by the EU accession process.

High Capital Inflows to the Private Sector and Capital Outflows from the Public Sector in the EMEs

In 2006, *net capital inflows to the private sector* in the EMEs maintained record levels reached in 2005. Following the turmoil in the global financial markets in late spring 2006, capital inflows started to increase again by mid-year in the face of robust economic growth expectations and decreasing inflation expectations. The IMF expects net capital inflows in 2007 and 2008 to attain previous levels and fully stem from net inflows of direct investment (as in previous years), while the much lower and receding net inflows under "other flows" (mainly loans) will not suffice to offset continuous net outflows under portfolio investment. *Direct investment* constitutes the most important net inflows in all regions. As in the previous year, *portfolio investment* will generate net inflows only in CEE, in the CIS countries and, to a significant degree, in Africa. In Asia, by contrast, the strong net outflows that started in 2006 will continue. As for *"other flows",* net inflows will again concentrate on CEE, the CIS and, this year, Asia. Latin America and Africa will again post net outflows. CEE, as the only of these regions to

Table 2

Net Capital Inflows to Emerging Market Economies and Developing Countries[1]

USD billion

	2003	2004	2005	2006	2007[2]	2008[2]
Net capital inflows to the private sector	173.3	238.6	257.2	255.8	252.7	259.3
By instrument						
Direct investment	165.3	190.0	266.3	266.9	283.7	288.9
Portfolio investment	−12.1	25.0	29.4	−76.3	−62.0	−52.2
Other flows	20.1	23.5	−38.5	65.2	30.9	22.6
By region (country)						
Europe	52.5	74.7	117.5	121.1	109.0	117.7
CIS	17.9	7.7	37.6	65.7	38.0	28.6
Middle East	4.7	−12.0	−19.9	−15.5	14.4	34.8
Africa	2.7	12.3	18.3	20.2	28.6	39.9
Asia	69.2	142.5	69.7	53.9	30.7	−5.8
Latin America and the Carribean	26.2	13.3	33.9	10.4	32.0	44.2
Net capital inflows to the public sector[3]	−44.5	−57.8	−122.6	−143.8	−96.4	−116.6
Memorandum items						
Current account balance	*229.4*	*299.7*	*511.6*	*638.5*	*548.6*	*567.1*
Reserve assets[4]	*−358.9*	*−508.2*	*−590.1*	*−738.4*	*−715.5*	*−716.4*
of which held by China	*−117.2*	*−206.3*	*−207.0*	*−240.0*	*−290.0*	*−320.0*

Source: IMF (World Economic Outlook).

[1] This table shows aggregated balance of payments data sets of 131 nonindustrialized countries, including 44 major EMEs. Europe = CEE excluding European CIS countries and including Turkey. Asia = Asia including Hong Kong, Korea, Singapore and Taiwan.

[2] Forecast.

[3] A minus sign indicates a net outflow of capital from developing countries to industrialized countries.

[4] A minus sign indicates an increase.

continuously post a high *current account deficit,* will presumably continue to attract the largest share of net capital inflows to the private sector in 2007 and 2008. The only region that posted *net capital outflows* from the private sector in 2006 (petrodollar investments) was the Middle East, which is also expected, however, to record net inflows in 2007 and 2008. All other regions posted high *current account surpluses combined with net capital inflows* to the private sector in 2006. The same is expected for 2007 and 2008.

In all regions, *public sectors* recorded *net capital outflows* (repayment of foreign debt and investments) accompanied by a further *increase of gross official reserves* in 2006. The IMF forecasts similar results for 2007 and 2008, with the exception that net inflows to the public sector are expected for Africa.

Claims of Austrian Banking Sector Lead in CEE

At the end of September 2006, claims of Austrian banks (excluding Bank Austria Creditanstalt) in CEE and Turkey made up more than 7% of recipient countries' nominal GDP. Austrian banks thus had a higher share in claims on this region than the banks of any other country. Compared to other lending countries' banks, Austrian banks held the highest stock of claims on any EU Member State in CEE (except for the Baltic countries and Poland), sharing first place with Belgian banks in the Czech Republic and with German banks in Hungary. The claims of all BIS reporting banks on Slovakia, Slovenia and Croatia were concentrated on Austrian banks to a particularly high degree.

Table 3

Claims of BIS Reporting Banks on Central and Eastern Europe and Turkey[1]

% of GDP of the recipient country

	AT	DE	IT	FR	NL	SE	BE	UK	Europe[2]	US	JP
CEE plus Turkey	**7.3**	**5.9**	**3.3**	**3.4**	**2.2**	**2.5**	**3.1**	**1.5**	**34.0**	**1.8**	**0.6**
EU Member States in CEE (excluding the Baltic countries)											
Bulgaria	8.9	3.3	6.0	3.0	1.0	0.0	0.3	0.5	42.2	1.3	0.1
Czech Republic	21.8	5.3	1.7	16.2	2.9	0.1	21.8	1.8	73.1	2.5	0.5
Hungary	20.0	20.3	8.8	3.8	2.6	0.2	10.2	0.7	71.2	2.3	0.9
Poland	3.0	7.1	5.9	1.4	4.4	0.8	3.0	0.7	34.0	2.6	1.0
Romania	8.4	1.7	2.3	7.0	3.6	0.1	0.1	0.2	31.8	1.0	0.1
Slovakia	34.9	4.2	17.2	2.3	4.2	0.1	7.5	1.1	72.1	2.0	0.1
Slovenia	22.3	12.9	1.2	4.8	0.7	0.0	4.6	0.8	48.8	0.3	0.7
Other CEECs											
Croatia	54.8	7.3	48.3	16.3	0.5	0.0	0.7	0.6	129.5	0.4	1.0
Russia	1.1	3.2	0.2	0.7	1.1	0.1	0.1	0.6	8.6	0.9	0.6
Turkey	0.2	4.2	..	2.6	1.7	0.1	2.2	3.0	16.6	2.6	0.6

Source: BIS, Eurostat, Thomson Financial, national sources and OeNB calculations.

Note: The claims shown here correspond to the „Consolidated foreign claims of reporting banks" published by the BIS (BIS Quarterly Review March 2007, Table 9B). For every bank, these include the claims (in all currencies) of both parent and subsidiary companies on borrowers outside the group in the relevant countries. In this consolidated overview, claims of Austrian banks do not include claims of the Bank Austria Creditanstalt group.

[1] As of end-September 2006.

[2] In addition to the countries of origin listed individually, „Europe" also comprises Denmark, Greece, Ireland, Portugal, Finland, Spain, Switzerland and Norway.

Eurobonds Resilient against Investors' Reduced Risk Appetite

After the financial market turmoils between May and June 2006 and the ensuing recovery, developments on the international eurobond market remained basically positive from end-September 2006 to end-March 2007. The average yield spread on U.S. dollar- or euro-denominated government bonds of emerging market issuers against benchmark bonds as measured by J. P. Morgan's (Euro) EMBI Global index narrowed by a total of 38 basis points (USD) and 16 basis points (EUR), respectively, during this period.

Table 4

Eurobonds: Spreads to Reference Bonds and Returns by Region

	EMBI Global (USD)						Euro EMBI Global (EUR)					
	Weight in total index in %	Yield spreads in basis points		Total return in %	Rating	Duration	Weight in total index in %	Yield spreads in basis points		Total return in %	Rating	Duration
	March 30, 2007	March 30, 2007	Change since Sep. 30, 2006	Since Sep. 30, 2006	March 30, 2007	March 30, 2007	March 30, 2007	March 30, 2007	Change since Sep. 30, 2006	Since Sep. 30, 2006	March 30, 2007	March 30, 2007
Overall index	100.0	170	−38	6.3	BB+	7.38	100.0	60	−16	1.1	BBB	5.43
Africa	2.4	294	6	4.1	..	3.29	4.9	66	−26	1.6	BBB+	5.56
Asia	16.3	142	−40	6.1	BB+	6.88	4.8	61	−41	2.3	BBB	4.29
Europe	24.5	147	−18	5.1	BBB−	6.92	69.7	49	−10	0.6	BBB+	5.54
Latin America	53.7	173	−45	7.2	BB+	8.07	20.6	96	−30	2.1	BBB−	5.29
Middle East	3.1	424	4	4.1	B−	5.09	..	..	..	..	..	..

Source: Bloomberg, JP Morgan, OeNB calculations.

Note: The EMBI Global and Euro EMBI Global indices differ in composition (in terms of currencies, countries covered, instruments, maturities, etc.). Differences in the level and development of yield spreads and returns as well as in other index features can be attributed in part to this different composition and in part to different investor structures. The rating is calculated as the average of Moody's, Standard & Poor's and Fitch's ratings for long-term government foreign currency sovereign debt and is expressed in the rating categories of Standard & Poor's.

The general downward trend in yield spreads was interrupted by two temporary setbacks at the beginning of December 2006 and the end of February 2007. Compared to stock markets, to high-yield bond markets and individual currencies, the eurobond market proved to be largely resilient to increasing risk aversion at the end of February 2007.

Although yield spreads of U.S. dollar- and euro-denominated eurobonds moved in the same direction, differences in the yield levels (which were higher for bonds denominated in U.S. dollars) and in yield trends (decline for U.S. dollar-denominated bonds, increase for euro-denominated bonds) led to differences in *total returns*. In the period under review, eurobonds denominated in U.S. dollars generated non-annualized total returns of more than 6%, while bonds denominated in euro only generated returns of about 1%. In both market segments, eurobonds of European issuers again underperformed the overall index. This relatively poor performance can be attributed to the comparatively low initial spread levels of eurobonds of European issuers and the (partly related) small extent to which yields declined further.

At the level of the overall indices, narrowing average yield spreads continued to be in line with developments in *economic fundamentals* (as measured by the average ratings). For the countries included in the EMBI Global and Euro EMBI Global indices the number of rating upgrades by the three leading rating agencies clearly exceeded the number of downgrades, even if the ratio of upgrades to downgrades somewhat deteriorated in the first quarter of 2007. Out of all the CEECs included in the indices, five countries (Bulgaria, Poland, Romania, Slovakia and Lithuania) were upgraded and only one country (Hungary) was downgraded.

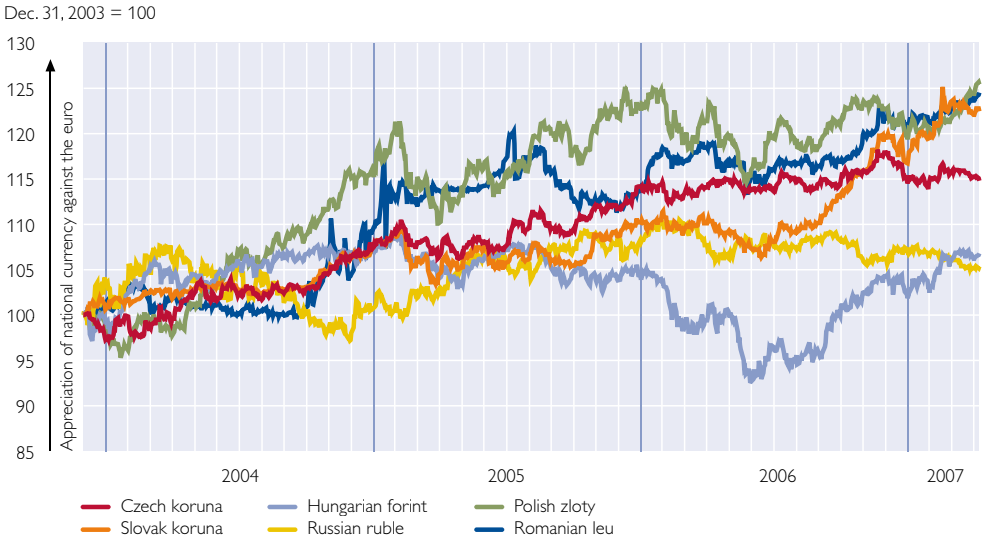
The *risk factors* for eurobond markets mentioned in the OeNB's previous Financial Stability Report persist. First of all, the low extent by which investors differentiate between individual issuers (measured by the dispersion of yield spreads across the countries included in the relevant indices) is still not fully in line with the dispersion of their ratings, although the dispersion of ratings across countries included in the EMBI Global index declined in the course of 2006. Second, the difference between the yield spreads on eurobonds of sovereign debtors and on corporate bonds of the same rating class (not adjusted for maturity) remains negative, sometimes even to a greater extent, for most rating classes. Third, currently low yield spread levels also depend on global liquidity conditions and investors' willingness to assume risk. In this context the major risk factors for the eurobond market are a serious economic slowdown, higher than currently anticipated key interest rates or an unexpected sharp increase of long-term interest rates in the industrialized countries, a disorderly correction of global imbalances and an increase in geopolitical risks.

Central and Eastern Europe: Significant Exchange Rate Gains for Hungarian Forint and Slovak Koruna

Between end-September 2006 and end-March 2007 most CEE currencies under review strengthened against the euro – some of them significantly. The Slovak koruna and the Hungarian forint underwent the largest appreciation, gaining 12.1% and 10.2%, respectively. The Hungarian

Chart 2

Exchange Rates of National Currencies against the Euro



Source: Thomson Financial.

Note: Index based on euro per unit of national currency.

forint thus more than made up for ground lost in June 2006 and the Slovak koruna even appreciated by 16% against its low in mid-July 2006.

Upon request of the Slovak authorities, the ERM II central rate of the Slovak koruna was revalued by +8.5% against the euro with effect of March 19, 2007. The accompanying communique stated that this revaluation was justified by current developments in the underlying economic fundamentals. Furthermore, the decision to revalue the Slovak koruna was based on the firm commitment by the Slovak authorities to pursue an economic policy aimed at achieving price stability and maintaining competitiveness. According to the communique, this approach includes strengthening the fiscal adjustment path in line with the Council opinion on Slovakia's convergence program, the promotion of a wage policy which reflects labor productivity growth, the continuous pursuit of structural reforms so as to raise productivity growth and improve the functioning of markets, and vigilance concerning risks of strong credit growth.

At 5.4%, the Romanian leu also strengthened substantially against the euro, while the Czech koruna and the Polish zloty appreciated to a much smaller degree.[1] These currencies mostly gained in the fourth quarter of 2006. The exchange rate of the Croatian kuna remained largely unchanged during the period under review, while the Russian ruble depreciated by some 2% against the euro. The Russian ruble gained almost 1% against its currency basket, which is composed of euro (45%) and U.S. dollars (55%). Until end-2006, the Slovenian tolar fluctuated against the euro within a very narrow margin, remaining close

[1] *However, the Polish zloty gained strongly in the weeks before and after the interest rate hike of end-April.*

to its ERM II central rate. At the beginning of 2007, Slovenia joined the euro area and adopted the common currency at the central rate of SIT/EUR 239.640.

During most of the period under review, the CEE currencies experienced a favorable *international environment* marked by high liquidity, a pronounced tolerance for risk and a continuing quest for higher returns in higher-risk market segments. However, these currencies also proved to be resilient to the increased volatility and falling prices that were seen in other segments of the international capital market (e.g. stocks, high-yielding bonds and some currencies) from end-February to early March 2007, even though stock prices were exposed to some pressure also in CEE.

The exchange rate of the Hungarian forint had depreciated markedly because of an increasing risk aversion in the international capital markets between May and June 2006, which coincided with severe external imbalances and the government's lacking economic policy credibility. However, during the reporting period, investors' confidence in Hungary improved markedly, even if one rating of foreign currency bonds was downgraded. Stronger investor confidence can be attributed to the announcement of a comprehensive fiscal consolidation plan and initial steps that were taken to reduce the excessive fiscal deficit, which had reached almost 10% of GDP in 2006. Furthermore, the government started with the introduction of structural reforms, and domestic policy turmoil abated. In Slovakia as well, the new government, which has been in office since July 2006, was able to overcome initial skepticism and gain market confidence. Its stance to stick to the projected date for the introduction of the euro at the beginning of 2009, the adoption of a sound budget for 2007 and the presentation of a convergence program focusing on deficit reduction were probably the key factors for this success. In Poland, domestic politics, which had caused short-term negative reactions on the markets around end-June and the beginning of July 2006 as well as at end-September 2006, calmed down as well, while in Romania the country's upcoming EU accession may have contributed to positive market sentiment and fueled exchange rate gains in November and December 2006.

Most CEE currencies appreciated in an *environment of strong economic growth*. In 2006, GDP growth came to between 5% and 8% and accelerated – or remained at a constantly high level – in most of the countries analyzed in this report. The only exception was Hungary, where growth rates decreased owing to austerity measures introduced by the government. In the second half of the year, growth was generally more dynamic than in the first half, except for the Czech Republic and Hungary, which experienced slowdowns, and Croatia, which posted constant growth levels. In contrast to 2005, growth in 2006 was primarily based on domestic demand (with the exception of Hungary), which accelerated in the second half of the year (except in Hungary and Croatia). Among the components of domestic demand, investment growth was stronger than consumption growth (except for Hungary), which remained below GDP growth rates (with the exception of Bulgaria and Romania). The contribution of net exports to growth was positive in Slovakia, the Czech Republic and Hungary and negative

in the other countries; it was particularly negative in Bulgaria and Romania. This phenomenon can be attributed to the fact that imports accelerated a lot more strongly than exports in most cases (with the exception of Hungary and Slovakia). However, the exports of most of the countries under review were able to increase or hold their shares in world imports and EU-27 imports in 2006 – despite the fact that their terms of trade deteriorated in most cases.

In the second half of 2006, the *combined current and capital account balances* developed differently in the countries under review. In Slovakia and Hungary, the deficit was lower than in the second half of 2005. It was still high in Slovakia, however, coming to 8.7% of GDP. In Poland, the deficit remained unchanged at 1.7% of GDP, once again reaching the lowest level of the countries under review. Deficits increased in the Czech Republic and in Slovenia, and went up to a significantly stronger degree in Bulgaria and Romania, where deficit levels reached 14.6% and 9.6% of GDP, respectively (up from already high levels in the second half of 2005). In Croatia, the traditional tourism-related surplus in the second half of the year was lower than in the comparable period in 2005. In line with the positive contribution of net exports, the goods and services balance improved in Slovakia, where the deficit went down from 5% to 4% of GDP, and in the Czech Republic and Hungary, which posted surpluses of a little over 1% of GDP. In Bulgaria and Romania the continuously high deficits in the goods and services balance were mostly responsible for the current account gap in the second half of 2006. The partly high or increasing external deficits can be explained by strong economic growth and high investment demand, although investment growth to some extent also reflects vigorous residential construction activity. In Bulgaria and Romania, strong consumer demand is likely to have contributed to import demand as well. Net inflows of direct investment (including intra-company loans) helped reduce the financing gap significantly in most of the countries under review, which is a positive development. In the second half of 2006 (and also over the entire year 2006), large financing requirements existed only in Slovenia, as there was a net outflow of direct investment (low inflows, continued outflows) and the current account deficit increased. Croatia's sum of the current account balance and net direct investment was positive, as usual, during the season, and near zero for the entire year.

The Hungarian forint and the Romanian leu continued to be exposed to appreciation pressures from high *short-term interest rate differentials against the euro area*. However, interest rate differentials decreased slightly in Hungary and significantly in Romania. Reasons for the strong decrease in Romania lay in rising interest rates in the euro area but also in interest rate cuts Banca Națională a României had introduced in the wake of decreasing inflation and slightly weakening loan growth with a view to reducing appreciation pressures. For both countries, market participants expect short-term interest rates to decline in the course of the next few months, which is likely to further reduce the interest rate differential against the euro area. The Slovak koruna appreciated at a time when short-term interest rate differentials were decreasing from the already sig-

nificantly lower levels they had reached before. At end-March 2007, market participants expected the interest rate differential to be negative relative to the euro area for the following months as interest rates were expected to fall in Slovakia and to rise in the euro area. In Poland, the short-term interest rate differential for the reporting period decreased from an already low level as well, while in the Czech Republic the negative interest rate differential widened further. Market participants expect short-term interest rates to rise more strongly in these two markets than in the euro area in the upcoming months.

During the period under review, Slovakia in particular conducted major *foreign exchange interventions* to influence exchange rate dynamics. After the Slovak koruna had started to appreciate strongly in mid-July 2006, Národná banka Slovenska reacted at end-December 2006, when the exchange rate stood at close to 11% on the strong side of the ERM II fluctuation band, by intervening on the foreign exchange market purchasing around EUR 500 million and followed up with further interventions in March 2007. In addition, Národná banka Slovenska tried to reduce the koruna's attractiveness by increasing money market liquidity. It did so by rejecting large bids at several reverse repo auctions. During the period under observation, Hrvatska narodna banka was also active in the foreign exchange market on several occasions in order to prevent extreme exchange rate fluctuations. These interventions exclusively consisted of foreign currency purchases from commercial banks during the tourist season.

In the reporting period, domestic loans expanded at a faster rate than domestic deposits particularly in Slovenia, and to a lesser extent in the Czech Republic and Poland. This development made banks more reliant on *foreign capital as a source of finance* and may thus have helped firm the respective currencies. In Bulgaria, Croatia and Russia, rising direct borrowing abroad by nonfinancial corporations exerted some appreciation pressure.

The continuous expansion of current account deficits in several countries still constitutes a *risk factor for the development of CEE currencies, even if most countries* so far have been able to finance these deficits mostly through net inflows of direct investment. Preventing deficits caused by excessively growing domestic and, in particular, consumer demand is a key challenge during the economic catching-up process. In addition, countries must create an attractive economic climate for direct investment inflows. If net inflows from direct investment do not suffice to meet external financing requirements, countries depend on net inflows of portfolio investment and on higher borrowing in the form of foreign loans. Even though foreign parent companies (of banks or nonfinancial corporations) have granted a large part of outstanding cross-border loans so far, the sudden absence or net outflow of portfolio capital and cross-border loans represent a risk factor for exchange rates. In this context, rising long-term interest rate levels in the U.S.A. and the euro area and the subsequent reduction of the interest rate differential are relevant primarily for financial investors and possibly also for foreign direct investors. Shrinking interest rate differentials relative to Switzerland and Japan contribute to rendering the region less attractive

for financial investors via carry trades and might at the same time dampen the trend toward borrowing in Swiss francs that has been gaining popularity in several countries over the last few years. These factors may lead to higher exchange rate volatility and currency depreciation. Temporarily, such a development may also result from a slowdown in credit growth which has been financed by foreign capital inflows, or from net repayments of banks' foreign currency liabilities in the wake of a reorganization of their asset and liability structures, even if this might eventually reduce external financing requirements and the depreciation risk in the longer term.

Yield Differentials of Local Currency-Denominated Government Bonds on the Decrease

After a rise in the previous reporting period (end-March to end-September 2006), the *yield differentials of ten-year local currency-denominated government bonds* against euro area benchmark bonds narrowed in all four countries under review (Czech Republic, Hungary, Poland and Slovakia) between end-September 2006 and end-March 2007. As a result, yield spreads were below March 2006 levels in all these countries at end-March 2007. Hungary still recorded the highest spread against the euro area (260 basis points), followed by Poland and Slovakia (105 and 10 basis points, respectively). The yield of Czech ten-year bonds was close to 30 basis points below the euro area level. In terms of yield spread developments, Hungary saw the strongest decrease during the reporting period (–130 basis points), followed by Poland (–70 basis points), Slovakia (–50 basis points) and the Czech Republic (–40 basis points). The temporarily decreasing risk tolerance on the international capital markets caused yield spreads in these four markets to widen only preliminarily between end-February and mid-March 2007. By the end of March, spreads returned to the low levels recorded previously or (in Hungary) to even significantly lower levels.[2]

The *inflation differential against the euro area* (as measured by the HICP) corresponded to yield spread developments only in Slovakia, where the positive inflation differential narrowed from 2.7 percentage points in September 2006 to 0.2 percentage points in March 2007. The favorable inflation development can partly be attributed to energy prices but also to a decrease in core inflation (excluding prices for energy and unprocessed food) during that period. While inflation in the Czech Republic had been close to euro area levels in the previous reporting period, between October 2006 and February 2007 the country posted much lower (by up to 0.8 percentage points) inflation rates than the euro area. However, as inflation gained momentum, this negative spread gradually decreased and turned slightly positive in March 2007 (0.2 percentage points). In Poland, inflation also accelerated more strongly than in the euro area during the reporting period, primarily owing to developments in the "unprocessed food" segment. In March 2007, Poland posted the first positive inflation differential (0.5 percentage points) to the euro area since May

[2] *Moreover, this trend continued in April.*

2005. In Hungary, yield spreads narrowed against the background of a strongly widening positive inflation differential against the euro area. Higher inflation was primarily caused by a hike in indirect taxes and administered prices in the wake of fiscal consolidation efforts and a surge in the prices for unprocessed food. In all four countries domestic consumption currently does not seem to give rise to immediate inflationary pressures from the demand side, as consumption growth rates are below GDP growth rates. However, output gap developments might involve some medium-term inflationary risks, especially in Poland, the Czech Republic and Slovakia.

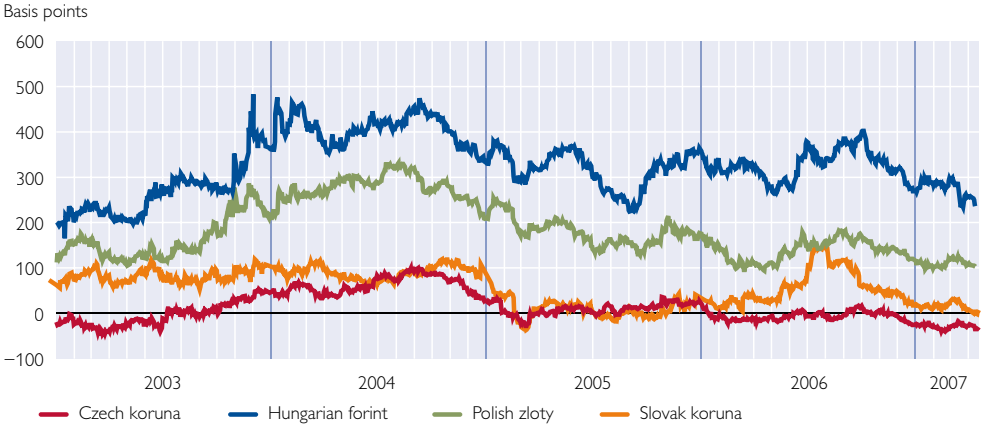
Declining positive *differentials* (or, as in the case of the Czech Republic, widening negative differentials) *between short-term money market rates in the four countries under review and those in the euro area* also supported the narrowing of long-term yield spreads in the period under review.

Particularly in Hungary, *budgetary developments* underpinned the decrease of long-term yield spreads during the past months (see section "Central and Eastern Europe: Significant Exchange Rate Gains for Hungarian Forint and Czech Koruna"). The Czech Republic and Poland also successfully reduced their fiscal deficits (including the net costs of reforming the pension system by partially switching to a funded system) to 2.9% and 3.9% of GDP, respectively, in 2006, while the Slovak deficit expanded to 3.4% due to an increase in pension reform costs. According to the April 2007 fiscal notifications, the deficits in Hungary, Poland and Slovakia are projected to narrow in 2007 (to 6.7%, 3.4% and 2.9%, respectively), while the Czech Republic is expected to see a significant increase in the deficit ratio to 4% caused by higher social security expenditure.

In Slovakia and Hungary, yield developments will mainly depend on how strictly governments adhere to their fiscal consolidation plans but also on how significantly and sustainably inflation decreases. In the Czech Republic, by contrast, it is mainly the degree to which inflation is expected to accelerate (and the potential reaction of the central bank) that causes

Chart 3

Yield Spreads of Ten-Year Government Bonds against Euro Benchmark Bonds



Source: Eurostat.

uncertainties in yield developments (aside from the implementation of fiscal plans), while uncertainties in Poland are related to a possible interest rate hike aimed at preventing a potential acceleration of inflation. An increase in volatility and contingent price corrections in other segments of the international capital market also constitute risk factors. However, the expected correction of economic imbalances in Hungary and the largely stability-oriented economic policies in all four countries should provide some cushion against such unfavorable external developments.

Stable Financial Position of the Real Economy Sectors

Corporate Risk Position Remains Favorable

Economic Upturn Continues

Austria's economy stayed very dynamic throughout the first half of 2007. Lively investment activity continued to be a major pillar of economic growth. Investment in construction as well as plant and equipment picked up. On the demand side, the brisk development of exports contributed significantly to investment dynamics. Moreover, companies' capacity utilization rose.

After surging in the two preceding years, Austrian corporate profits remained on the rise, as did those in the euro area. In this favorable economic environment, sales fared well, while unit labor costs continued to develop moderately.

In the wake of the economic uptrend, the number of corporate insolvencies – usually a lagging economic indicator – decreased, sinking by 4.6% in the 12 months up to the end of the first quarter of 2007 against the same period of the previous year. Both the number of proceedings opened and the number of no asset cases declined. Although estimated default liabilities rose by 4.8% in nominal terms, their ratio to the total liabilities of the corporate sector (according to the financial accounts) remained unchanged at 0.7%.

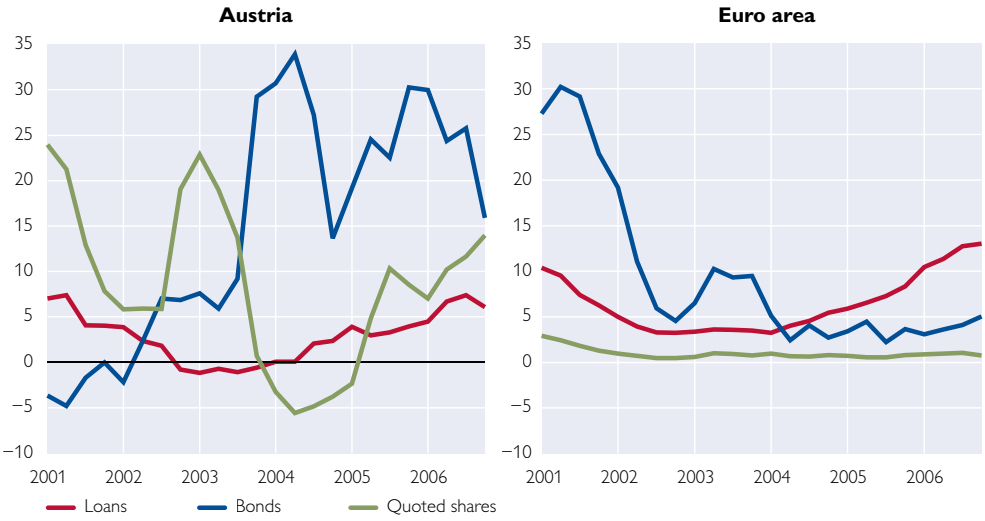
External Financing Structure Marked by Capital Market

In spite of stepped-up investment activities, the volume of external financing dropped by 32% to EUR 5.7 billion in the second half of 2006 against the corresponding period of the previous year. This decline essentially resulted from a one-time transaction in the billions through which a company group reduced considerable

Chart 4

Development of Important Financial Instruments

Annual change in %



Source: OeNB, EZB.

asset and liability positions.[1] Moreover, the good profit situation allowed companies to finance their activities largely from their own income.

In the second half of 2006, around one-fifth of corporate external financing was based on bank lending, which accelerated in tandem with the rise in investment in the course of the year. In the fourth quarter of 2006, bank lending increased by 6% against the same quarter of 2005, but growth in this segment has trailed that observed in the euro area until recently.[2] All new loans (net) were denominated in euro and, on balance, companies reduced their outstanding foreign currency loans.

According to the Austrian results of the Eurosystem bank lending survey, in the second half of 2006 and in the first quarter of 2007, enterprises took out loans mainly to fund mergers and acquisitions or to finance corporate restructuring. Moreover, a key motive for borrowing was to fund fixed investment.

In the second half of 2006, the capital market made by far the biggest contribution to corporate financing. Capital market instruments (bonds and quoted shares) accounted for almost two-thirds of external finance in that period.

The expansion of bond-based financing remained highly dynamic in the second half of 2006 even though the volume of new issues was almost two-thirds lower than in the same period of the previous year. According to the OeNB's securities issues statistics, the outstanding volume of corporate bonds went up by 12% against the previous year, far more than the euro area equivalent.[3] The biggest issues of the past year were launched by infrastructure companies. Overall, more than 40 companies issued bonds in 2006. More than three-quarters of the 2006 issuing volume were fixed-rate bonds, while floating-rate notes accounted for the rest.

New issues on the Vienna stock exchange (Wiener Börse AG) came to around EUR 2.3 billion in the second half of 2006, of which new listings represented roughly EUR 1.4 billion. Moreover, the stock exchange handled numerous capital increases. Real estate companies continued to strongly use the stock exchange as a source of funding. Additionally, several industrial and service companies issued shares on the Vienna bourse. Nevertheless, the number of companies issuing shares is still relatively small. In the second half of 2006, a total of 15 nonfinancial corporations raised funds on the Vienna stock exchange.

Thanks to the high issuing volumes and sustained price increases, the market capitalization of the nonfinancial corporations listed on the Vienna stock exchange advanced by more than EUR 11 billion to more than EUR 82 billion in the second half of 2006, an amount corresponding to some 32% of GDP.[4]

[1] *This transaction was also responsible for a decline in financial investment according to the financial accounts in the second half of 2006.*

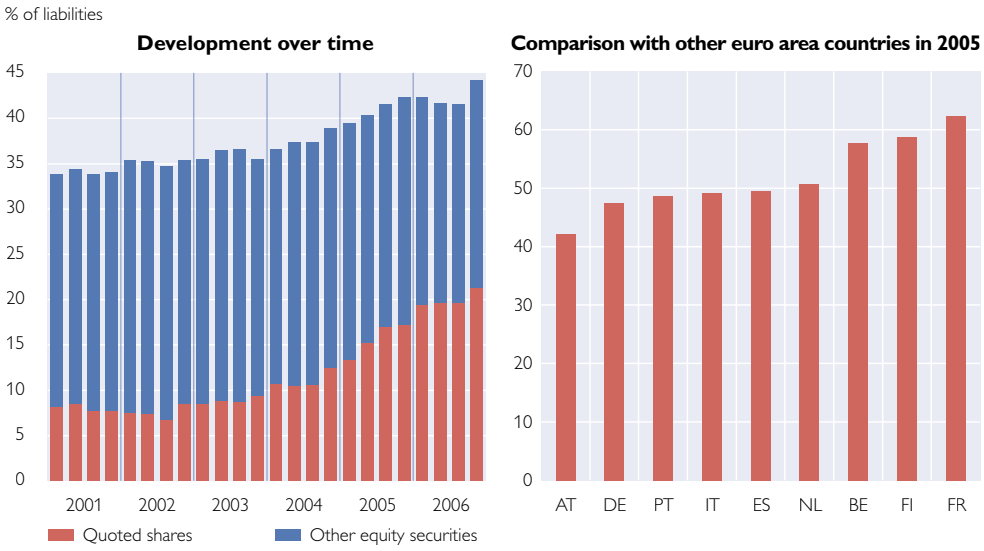
[2] *According to the MFI balance sheet statistics. By analogy to the ECB method, the outstanding volume of bank lending is calculated as the percentage change against the previous year on the basis of changes in transactions, i.e. adjusted for reclassifications, revaluations, exchange rate and other nontransaction changes.*

[3] *The outstanding volume of bonds is also calculated using the ECB method.*

[4] *The market capitalization of all stocks listed on Wiener Börse AG (including financial corporations) came to 57% of GDP at the end of 2006.*

Chart 5

Shares and Other Equity of the Corporate Sector



Source: OeNB, BIS, Eurostat.

Including OTC equities, more than one-third of the external financing volume of nonfinancial corporations was in the form of equity in the second half of 2006. As a result, the share of equity in total liabilities rose to 44.2% at end-2006.[5] The development of stock prices on the Vienna stock exchange also made a significant contribution to this increase because equity raised on the stock exchange is valued at current market prices in line with international conventions. Thus, the capital ratio of Austrian enterprises again moved closer to the euro area average, although Austria is still at the bottom of the list of euro area countries for which data are available (see chart 5, right panel).

Financing Conditions Deteriorate Slightly

While financing conditions for Austrian companies remained relatively favorable in the first quarter of 2007, they were not quite as good as in 2006, both for borrowing funds and for issuing equity capital.

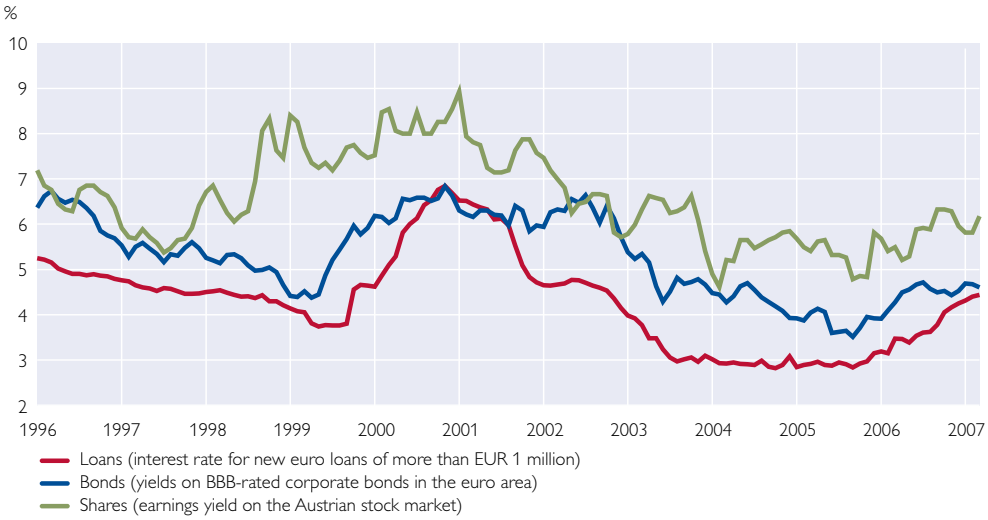
Following a 21.7% rise in share prices in 2006, the Austrian Traded Index (ATX) further increased by 6.0% in the first quarter of 2007. In spite of this sustained upward trend, share prices at the Vienna stock exchange were not able to keep pace with the development of the profits of listed companies. As a result, the earnings yield[6] rose throughout most of 2006, which implies that the cost of raising capital slightly deteriorated in the stock market.

[5] *Please note that the financial accounts statistics do not cover the claims of equity investors on nonfinancial assets and thus underestimate the absolute level of equity.*

[6] *The earnings yield is the inverse of the price-to-earnings ratio.*

Chart 6

Corporate Financing Conditions



Source: OeNB, Thomson Financial, Wiener Börse AG.

The yields of corporate bonds have been relatively constant in the euro bond market since mid-2006.[7] The yield curve flattened further, and the risk premiums on corporate bonds relative to government bonds of similar maturity remained low. As a result, the gap between bond yields and interest rates on loans has narrowed considerably since mid-2006.

Borrowing conditions worsened marginally in the course of 2006. The development of interest rates on corporate loans has reflected the ECB's key interest rate increases since December 2005. With the exception of the transmission of monetary policy impulses to loans, the pricing of bank loans has hardly changed in recent quarters. A comparison of banks' retail interest rates and interest rates for largely risk-free financial assets can provide an indicator of the average risk premium contained in banks' interest rates.[8] A look at the difference between interest rates for corporate loans and the swap rate of comparable maturities shows that the risk premium has only increased moderately since mid-2006 – both for loans up to EUR 1 million and for larger-volume loans.

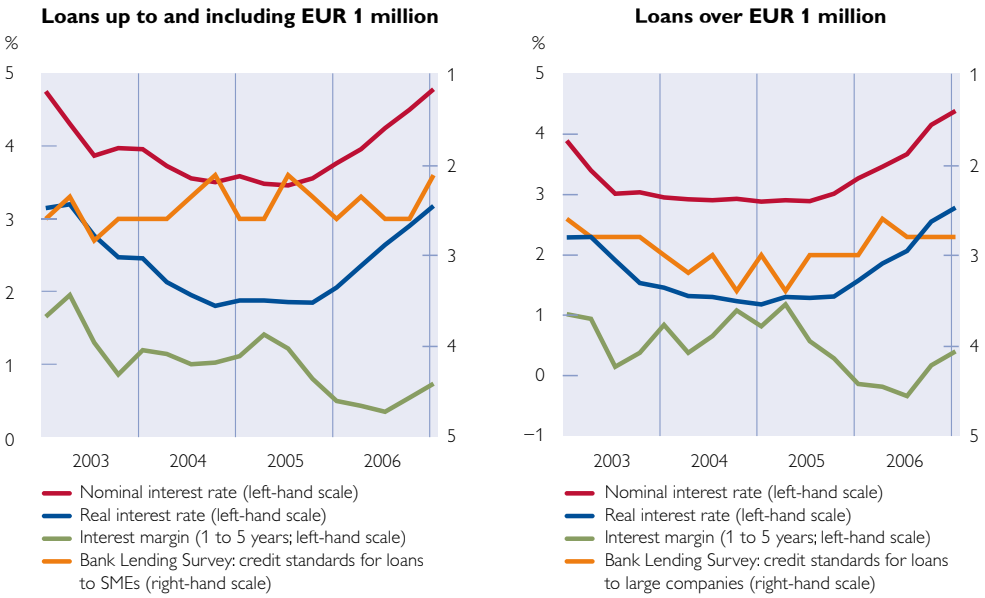
This finding largely coincides with the Austrian results of the Eurosystem bank lending survey, according to which lending conditions remained unchanged for big enterprises and were slightly tightened for small and medium-sized enterprises (SMEs). At the same time, banks reduced the interest margins for lending to borrowers with average credit ratings. They

[7] *The indicator used is the development of BBB-rated bonds in the euro area, first, because the bond market of the euro area is already highly integrated, and second, because no data series are available for Austria, as its market remains relatively narrow despite the rise in issuing volumes in recent years.*

[8] *In addition to the risk of the borrowers, the interest margin also results from the specific competitive situation on the Austrian loan market, which does not influence the risk adaptation as such, but its height.*

Chart 7

Conditions for Corporate Loans



Source: OeNB, ECB.

Note: Right-hand scale ranging from 1 (tightened considerably) to 5 (eased considerably).
Real interest rate: nominal interest rate less the OeNB's HICP forecast for the year following the forecast date.
Interest margin: interest charged for loans with a maturity from 1 to 5 years less three-year swap rate.
Bank Lending Survey credit standards: changes in the credit standards for loans to enterprises over the last three months.

also slightly lowered them for riskier loans in the first quarter of 2007.

Interest Expenses Rise

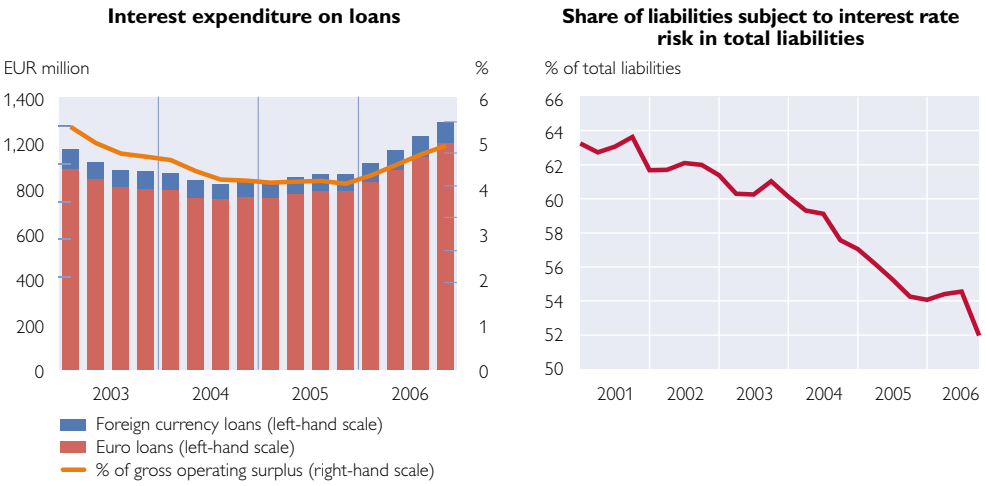
In 2006, the corporate sector's relative exposure to interest rate risk declined further because of the increase in equity financing. The share of loans and bonds in total corporate sector liabilities fell to around 52% in 2006 (see chart 8, right panel).

In spite of this decrease of the relative share of loans and bonds in corporate financing, their volume rose in absolute terms in 2006. This fact alone results in additional interest expenditure. Moreover, interest rates followed an upward trend in 2006. How rapidly regular interest payments reflect interest rate changes depends not just on the amount of liabilities on which interest is paid, but also on the fixation periods of the amounts outstanding. Given that the large majority of bonds have fixed interest rates, the rising importance of bond-based financing is likely to have gone hand in hand with longer-term interest rate fixations. In contrast, most bank loans are at variable interest rates in Austria, even those with longer maturities, although the structure of loans shifted slightly in favor of longer fixation periods in the second half of 2006. The share of loans at floating rates or up to 1 year initial rate fixation periods in new business dipped in recent months, but at about 90% remained very high in a euro area comparison.

Therefore, the corporate sector's interest expenditure is likely to have increased perceptibly in 2006. We multiplied the volume of loans outstanding by the relevant interest rates recorded in the interest rates statistics to obtain an estimate of the cost burden of interest payments on enter-

Chart 8

Interest Rate Risk in the Corporate Sector



Source: OeNB, Thomson Financial.

Note: Interest expenditure on euro loans: euro loans to nonfinancial corporations according to MFI balance sheet statistics multiplied by the corresponding interest rates on outstanding amounts according to the ECB interest rate statistics. Interest expenditure on foreign currency loans: foreign currency loans to nonfinancial corporations according to MFI balance sheet statistics multiplied by the corresponding interest rates on U.S. dollar, Japanese yen and Swiss franc loans to households and nonfinancial corporations according to the ECB interest rate statistics. Liabilities subject to interest rate risk: loans and bonds.

prises.[9] This method only takes account of interest payments, but does not consider noninterest rate charges (such charges are especially relevant in the case of foreign currency loans) so that the results obtained do not correspond to the total expenditure on loan repayment.

As chart 8 (left panel) illustrates, interest expenditure rose not only in nominal terms, but also in relation to the gross operating surplus in 2006. In the case of bonds, which usually have fixed rates, interest rate changes are likely to have had less impact to date. Considering that the calculation is an approximation, these figures are surrounded with considerable uncertainty. Nevertheless, they do indicate that higher interest expenditure is beginning to affect the risk-bearing capacity of the corporate sector.

Reduction of Foreign Currency Loan Exposure Continues

Companies further reduced their exchange rate risk in financial liabilities in the second half of 2006. The share of foreign currency loans in the corporate portfolio came to just 10.8% at end-2006, down 4 percentage points from two years earlier.

The share of loans denominated in Japanese yen has sunk considerably below the share of U.S. dollar-denominated financing. This implies that companies now primarily use foreign currency loans for business purposes, i.e. the exchange rate risk incurred corresponds to a real trans-

[9] *The interest rates for new business (both corporate and household) were used to calculate interest on foreign currency loans, because the interest rate statistics do not contain any data on outstanding amounts of foreign currency loans. As the lion's share of foreign currency loans is at variable rates, which are adjusted periodically, the inaccuracy of this method is not likely to be very large.*

action. This decline in foreign currency lending was probably influenced measurably by the narrowing differential of interest rates on foreign currency and on euro loans in recent years. Overall, companies also recorded slight unrealized valuation gains last year. These factors perceptibly reduced the exchange rate risk burden on the Austrian corporate sector.

Conclusion: Corporate Risk Perspective Remains Favorable

The risk position of the Austrian corporate sector continued to be positive at end-2006. Profits have risen until recently, enhancing not only the sector's internal financing potential but, together with higher external equity financing, also its capital position. While the growth of loans to the corporate sector has picked up again recently, its increased equity ratio and intensified bond issuing have reduced its relative dependence on interest rate developments. However, these augmented loan liabilities are paralleled by higher real investment on the assets side that should support the corporate sector's debt servicing ability through additional revenues. Moreover, companies have cut their foreign currency risk exposure substantially. This overall favorable risk perspective has also been mirrored by the decline in insolvencies until the first quarter of 2007.

In the second half of 2006, however, first signs pointed to a slight deterioration of the risk position of companies. In particular, the interest burden on enterprises considerably rose last year. While this development does not appear to be grave in the total aggregate and financing conditions have still been relatively favorable until recently, highly indebted companies will probably be hit hardest by the higher interest rates.

Climbing Financing Costs for the Household Sector

Strong Employment Growth and Reduction of Unemployment

The favorable economic environment has had a positive impact on the labor market. Strong employment growth reduced unemployment in spite of a parallel rise in labor supply. However, the increase of real incomes remained modest.

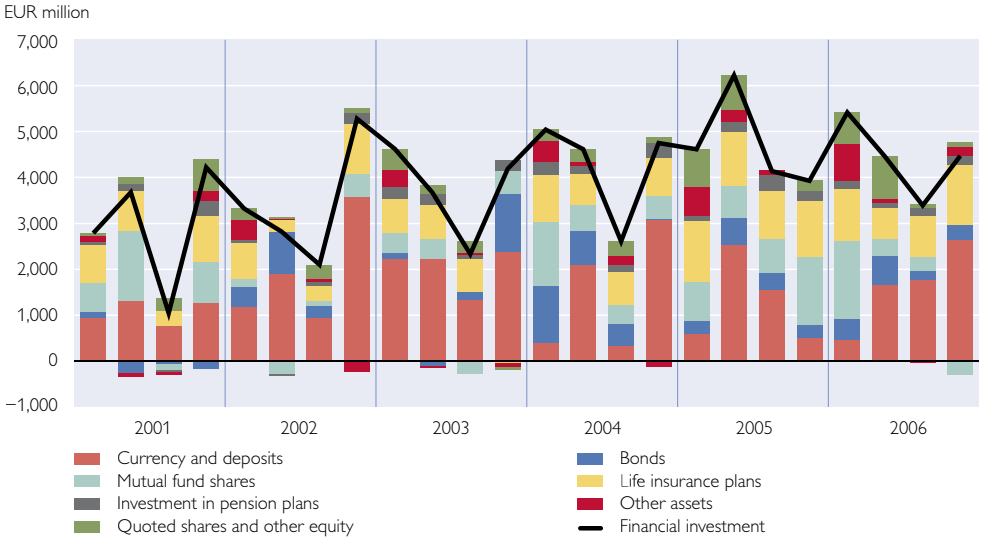
Low New Investment in Mutual Funds

Compared with the first half of 2006, financial investment decreased by one-fifth in the second half of the year.[10] In 2006, the share of mutual funds in financial investment was 8 percentage points lower than in 2005, with investments in bond funds declining particularly because of rising interest rates. Although the share of bonds in financial investment was low in the second half of the year, it was still higher in 2006 than in 2005. Legally speaking, structured products also form part of the bond segment, although as an investment instrument, households consider them more similar to mutual funds than to bonds. The diverging development of bonds and bond-based funds can be seen as a sign of the rising importance of structured products.

[10] *For 2006, the financial accounts also include information on the financial investments and financial assets of private foundations, so that the data are only comparable to a limited extent.*

Chart 9

Households' Financial Investment



Source: OeNB.

Marketable Instruments Account for Far More than One-Quarter of All Financial Investment

Instruments directly subject to market valuation (quoted shares, bonds and mutual funds) accounted for around 29% of financial investment at end-2006. Mutual funds accounted for 43%, bonds for 30% and quoted shares for 27% of these instruments. Together with indirect investment through mutual funds, bonds represent some 16% of households' financial investments and quoted shares around 12%.[11]

Low Diversification of Direct Investment…

While investments in quoted shares are exposed to valuation risks caused by price fluctuations, bonds involve valuation risks on account of interest rate changes. Additionally, securities not denominated in euro are subject to exchange rate risks. Diversification is an important tool for reducing the risks inherent in security investments.

Shareholdings concentrate on a relatively low number of different companies. Thus, five companies account for 28% of the financial investment of Austrian households in quoted shares, and almost half of all the shares held were issued by 15 companies. The most popular stocks are of real estate companies and major industrial and banking enterprises. Given this high concentration, the performance of direct share investments made by Austrian households depends on the development of a few shares, resulting in fairly considerable issuer risk.

According to the financial accounts, Austrian issuers accounted for slightly more than 70% of quoted shares directly held by Austrian households

[11] *The calculation is based on the assets of retail funds as shown in the mutual fund statistics and on the assumption that the breakdown of the funds' assets corresponds to the distribution of the mutual funds held by Austrian households.*

Households Increasingly Invest in Structured Products

The popularity of structured products has recently soared among private households. Structured products are composed of other financial instruments (quoted shares, bonds, derivatives). Their market value and coupons depend on the development of the underlying assets. These may be individual securities or a basket of securities, indices, raw materials and other assets.

Zertifikate-Forum Austria, which has been joined by five issuers of structured products on the Austrian market, started to provide data on mutual fund shares in 2006. According to that source, households had invested around EUR 4.2 billion in structured products issued by the members of Zertifikate-Forum Austria at end-2006, which corresponded to an annual growth rate of more than 20%.[1] Although this represents only 1.2% of financial investment, it still accounts for more than 10% of households' assets invested in mutual fund shares and almost 15% of the bonds held by them, to which structured products belong in legal terms.

Structured products come in a great variety of types, each of which involves a different level of risk. So-called investment products primarily serve as an alternative to mutual funds. Many of these investment products are provided with a (nominal) capital guarantee that, however, usually applies only at maturity and not in the case of earlier sale. In contrast, leverage products are of a rather speculative nature, as their rapid turnover already indicates: according to data provided by Zertifikate-Forums Austria, leverage products accounted only for 2.6% of the outstanding amounts, but for almost one-quarter of turnover at end-2006.

As structured products permit investment in a broader range of asset classes, they enhance the possibilities for portfolio diversification. On the one hand, this has a potentially positive effect on the risk position of households. On the other hand, households may incur risks through structured products that are hardly open to them otherwise, e.g. commodity risks.

This is especially relevant in combination with the fact that structured products are frequently highly complex. Although it is basically possible to determine their future development as a function of the development of the underlyings, this requires advanced knowledge of financial mathematics in the case of structured products with embedded options. The complexity of some products may make it difficult for investors to assess their future development correctly for different market developments of the underlyings or to identify whether a specific mutual fund share is in line with the investors' revenue and risk attitudes as well as their financial position.

[1] As not all issuers active in the Austrian market have joined Zertifikate-Forum Austria or report data, the total volume is actually higher.

and for almost 85% of bonds at end-2006.

Security-by-security information[12] shows that more than 80% of investments in quoted shares and some 95% of investments in bonds go to issuers from the euro area. Both for shares and bonds, Germany ranks second among issuer countries. With 6% of capital invested in shares, the U.S.A. is the most important issuer country outside the euro area.

Euro-denominated securities accounted for 87% of shares and 96% of bonds held by households. Because of this focus on Austria and the euro

[12] See also: Andreasch, M. and A. Schubert. 2007. Portfolio Shifts in Securities Held by Households in Austria: Analysis Based on Security-by-security Information. In: Irving Fisher Committee on Central Bank Statistics (ed.). IFC Bulletin No. 25.

area, direct investments involve only minor exchange rate risks, but a strong dependence on the development of the capital markets in a few countries.

… But Indirect Investments Improve Diversification

The portfolio of mutual funds usually covers more companies than direct investments by households. Almost 95% of shares and 78% of bonds held through mutual funds are foreign securities according to the mutual fund statistics. Issuers from outside the euro area clearly play a greater role in indirect investment in shares than in direct investment in shares. Thus, while direct investments are highly concentrated, indirect investments are widely diversified. As a result, investments through mutual funds tend to reduce the risk taken when investing in securities.

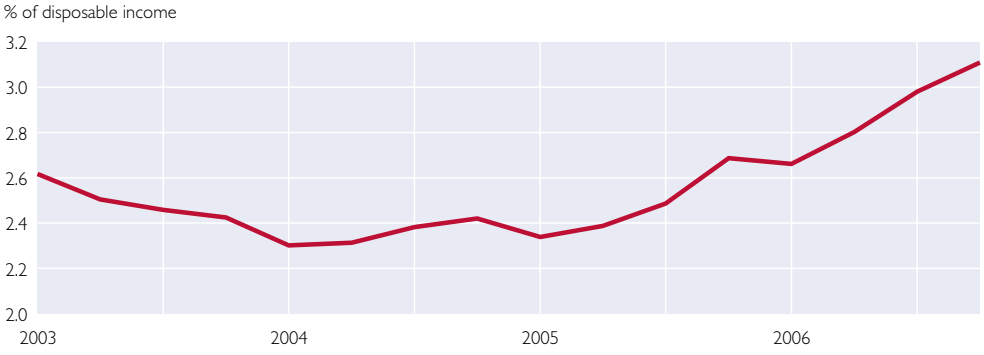
Interest Rate Burden Rises

At the end of the first quarter of 2007, the nominal interest rates for both new consumer loans and new housing loans were around 1 percentage point higher than in the year before. As variable rate loans represent a large share of household credits, higher interest rates translate relatively quickly into higher interest expenditure by households. The share of new euro-denominated housing loans at variable rates stood at roughly 58%; the share of new consumer and other loans to households at variable rates came to over 85%. Foreign currency loans are strictly at variable rates. According to the bank lending survey, credit standards remained almost unchanged both for housing loans and consumer loans in the second half of 2006.

Because of the further rise of interest rates on loans in connection with higher debt volumes, the increase of interest expenditure[13] on household loans observed since early 2004 continued in the second half of 2006. The share of household disposable income (according to national accounts) spent to pay interest on loans averaged 3.2% at end-2006. This value rose by 0.4 percentage point from the end of 2005. In this context, however, interest expendi-

Chart 10

Interest Expenditure on Household Loans



Source: OeNB.

[13] *Interest expenditure for household loans is calculated as the product of the volume of loans by maturity and purpose, and of the respective interest rate. Disposable income also covers the income of nonprofit institutions serving households. The calculations are based on OeNB forecast values.*

ture is related to the income of the entire population. A financial wealth survey of the OeNB[14] shows that roughly 40% of households have taken out a loan and that these have an above-average income. It is reasonable to assume that households with debts spend slightly less than 7% of their disposable income on interest payments.

Interest rate rises were responsible for the bulk of the increased interest burden on foreign currency loans as well as on consumer and other loans in 2006, whereas higher interest expenditure on housing loans was attributable almost equally to higher interest rates and higher household debt.

However, when interpreting interest expenditure figures, it must be noted that the result is only an estimate of the cost burden of loans on households and that cost factors are disregarded, e.g. non-interest-related charges and subsidies, with the latter playing an important role especially for housing loans. Additionally, only interest payments, not payments of principal, are considered.

Based on the values at end-2006, a rise of interest rates on loans by 200 base points would raise the share of disposable income spent on interest expenditure by 1.37 percentage points. If the currencies in which foreign currency loans are denominated appreciated by 10%, the interest burden would augment by 0.06 percentage point. Both factors combined would lead to an increase by 1.48 percentage points.[15] When interpreting the relatively low impact of exchange rate changes, one must bear in mind that this indicator only takes account of interest payments and neglects the rise in liabilities resulting from the higher euro equivalent.

Higher Debts of Affluent Households

According to financial accounts data, the debt ratio (debt as a percentage of GDP) of Austrian households has increased by roughly 8 percentage points during the past five years and stood at around 54% at end-2006. Thus, Austria's debt ratio is below the euro area average of slightly more than 60%. Given that 40% of households carry debt, the incidence of loans is low by international standards.[16]

To assess the risks of household debts to financial stability, it is important to know the debt concentration within the household sector and the ratio of debt to income and assets at household level. Data on these aspects are available for 2004 from the OeNB's financial wealth survey.[17]

Borrowing and loan volumes differ significantly depending on income and financial wealth. These differences also show in the distribution of outstanding loan amounts to the income and gross financial wealth quartiles. For example, households in the

[14] *Compare Beer, C. and M. Schürz. 2007. Charakteristika der Verschuldung der privaten österreichischen Haushalte in Österreich. Ist die Verschuldung ein Risiko für die Finanzmarktstabilität? In: Geldpolitik & Wirtschaft Q2/07. OeNB (forthcoming also in Monetary Policy & the Economy Q2/07. OeNB.)*

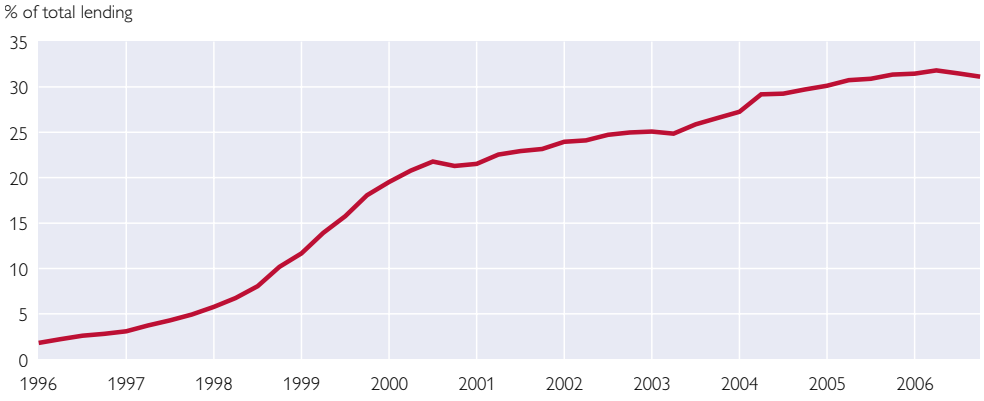
[15] *For this calculation, the loan volume recorded at the end of 2006 is maintained constant and multiplied by the respective interest rates. Fixation periods and potential changes in borrowing behavior are not considered.*

[16] *See Sierminska, E., A. Brandolini and T. M. Smeeding. 2006. Comparing Wealth Distribution across Rich Countries: First Results from the Luxembourg Wealth Study. LWS Working Paper Series No. 1.*

[17] *Compare Beer, C. and M. Schürz. 2007.*

Chart 11

Foreign Currency Loans to Households



Source: OeNB.

top income quartile account for 45% of the loan volume and households in the top gross financial wealth quartile for 30%. The share of these groups in the outstanding amount of consumer loans is even higher. From the perspective of financial stability, this means that a nonnegligible share of loans was taken out by households that can rely on reserves in the case of adverse events, such as a rise in interest rates for variable rate loans, an unfavorable development of exchange rates for foreign currency loans or an income reduction.

Moderate Decline in Foreign Currency Loans

The share of foreign currency lending in the total volume of loans outstanding slightly decreased in the second half of 2006, somewhat reducing the exchange rate risk in financing, which, however, remains high at 31%. This decline was probably caused by the lower interest rate differential to loans denominated in Swiss francs. Swiss franc-denominated loans account for 97% of households' foreign currency loans. Because of the appreciation of the euro against the Swiss franc, households achieved high valuation gains that on principle, however, are only unrealized gains.

Conclusion: The Risk Situation of Households Is Stable

As capital market instruments account for a growing share of households' financial investment, investment income and price fluctuations in financial markets are likely to have an increasing impact on the financial situation of households. A prime method to reduce risks inherent in capital market investments is broad portfolio diversification. While direct investments made by Austrian households are highly concentrated, indirect investments ensure a broader diversification. The risk inherent in capital market investments is also reduced by the fact that investment products subject to price risk are primarily held by households in the top income and wealth deciles.[18] These

[18] *Compare Beer, C., P. Mooslechner, M. Schürz and K. Wagner. 2006. Austrian Households' Financial Wealth: An Analysis Based on Microeconomic Data. In: Monetary Policy & the Economy Q2/06. OeNB.*

households should be in a position to absorb potential price losses so that price fluctuations should only have a limited impact on financial stability.

However, as saving for retirement by investing in capital markets gains importance, developments in capital markets will play a greater role in the risk position of the household sector.

Although the share of foreign currency loans in outstanding amounts slightly decreased in the second half of 2006, financial liabilities continue to attract sizeable exchange rate risks. Given the high share of variable rate loans, the interest rate risk is quite significant, which was evidenced by the further increase in the interest expenditure of households in the second half of 2006. In spite of the rising costs of finance, household debts currently do not point to any financial stability risk. Both in terms of volume and frequency, household debts are low by international standards, and the loan amounts outstanding are highly concentrated among affluent and high-income households. Moreover, favorable conditions in the labor market have a positive effect on the households' ability to meet their loan liabilities.

Indicators for Measuring the Financial Risks of the Corporate and Household Sector

The assessment of risks arising for the corporate and the household sectors from their activities in financial markets is a major aspect of the OeNB's macroeconomic financial stability analysis. The analysis covers the risks for the financial position of companies and households entailed by price fluctuations of financial parameters (interest rates, exchange rates, share prices, etc.). Three risk types are differentiated: interest rate risk, which relates to a change in the general interest level (change of the absolute value of an interest rate or shape of the yield curve), exchange rate risk, which results from fluctuations of the exchange rate between the settlement currency and the reference currency of the borrower or investor, and price risk, which is the risk of changes in the prices of assets.

The analysis measures the exposure of a sector to these risks on the one hand and, on the other hand, the change (in the book value) of assets or liabilities resulting from the price fluctuations of financial parameters is quantified (ex post effects). Statistics collected by the OeNB primarily for monetary analyses serve as the data basis. While they do not permit microlevel assessments, they allow for an analysis of risk development for companies and households at a sectoral level.

The extent of exposure to the three risk types is expressed by the share of those assets or liabilities subject to the risk concerned in total financial assets and total liabilities according to the financial accounts. Hence, the indicators specify the level of exposure across the entire maturity range of the instrument in question at the relevant cutoff date and, as a result, measure the upper limit of risk exposure. A breakdown by fixation periods shows lower exposure for shorter time horizons. However, this method only covers the risks directly resulting from the respective positions, but not indirect risks, such as the effect of an interest rate change on share prices.

For the analysis of exposure to interest rate risk, deposits, short-term securities and money market funds are included on the assets side; loans outstanding are considered on the liabilities side. The exposure to exchange rate risk is assessed on the basis of the share of deposits and loans denominated in foreign currencies. Price risks affect quoted shares and bonds because of interest rate changes. The relevant indicator covers both direct holdings and indirect investments through mutual funds. As changes in the valuation of assets traded in less liquid markets (e.g. nonquoted shares) are very difficult to identify and measure, the analysis only considers financial assets traded in a standardized form on stock exchanges (bonds, quoted shares).

Ex post effects can be quantified by multiplying the volumes outstanding with the corresponding changes in interest rates, exchange rates and share prices. Indicators were calculated for the interest burden of loans taken out,[1] the impact of exchange rate fluctuations for foreign currency loans and the effect of price changes for quoted shares, bonds and mutual fund shares. Exchange rate and price effects are essentially changes in the book value of assets, while the interest burden relates to changes of expenditure.

The analysis is enhanced and deepened continuously. In a next step, the data basis is to be expanded in order to improve the assignment of financial instruments to risk types and to refine the breakdown by intermediation level. A more detailed presentation is planned for a future issue of the Financial Stability Report.

[1] The data currently available do not allow for consideration of fixation periods.

Austrian Financial Intermediaries Benefit from the Benign Economic Climate

Investment in Central and Eastern Europe Fuels Banks' Total Asset and Profit Growth

Total Asset Growth Slows Down Somewhat

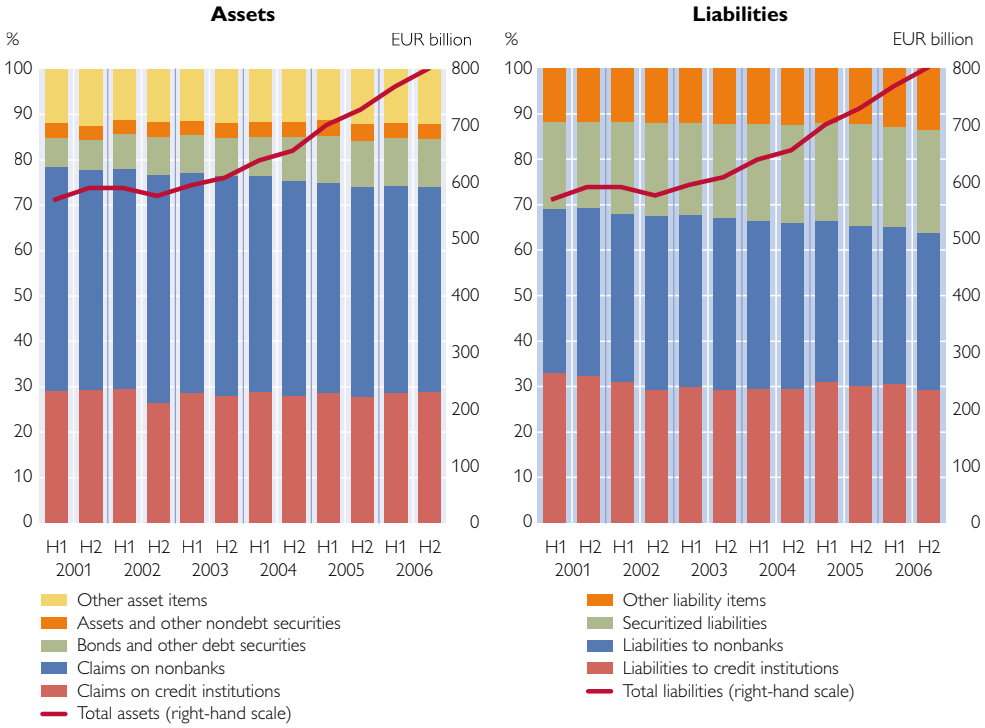
2006 witnessed a slight slowdown in growth in the unconsolidated total assets of the Austrian banking sector. Despite continued dynamic expansion (+9.9%), growth was not as high as in 2005 (+11.1%). By end-2006, unconsolidated total assets amounted to EUR 798 billion, with Austria's five largest banks[1] accounting for 43.8% of this sum. On a year-on-year basis, this group's total assets augmented by 9.0%, leaving its market share essentially unchanged.

Consolidated total assets, coming to EUR 928 billion as at December 2006, grew by 9.5% year on year.

External business remained the engine for growth in unconsolidated total assets – 36.9% of all assets were invested abroad in 2006. External liabilities accounted for 32.5% of total liabilities. External assets and liabilities grew by 19.4% and 10.5%, respectively, in 2006. On the assets side, claims on foreign banks and nonbanks rose by 21.7% and 16.9%, respectively, whereas on the liabilities side, external liabilities to banks and

Chart 12

Balance Sheet Structure of the Austrian Banking Sector (Unconsolidated)



Source: OeNB.

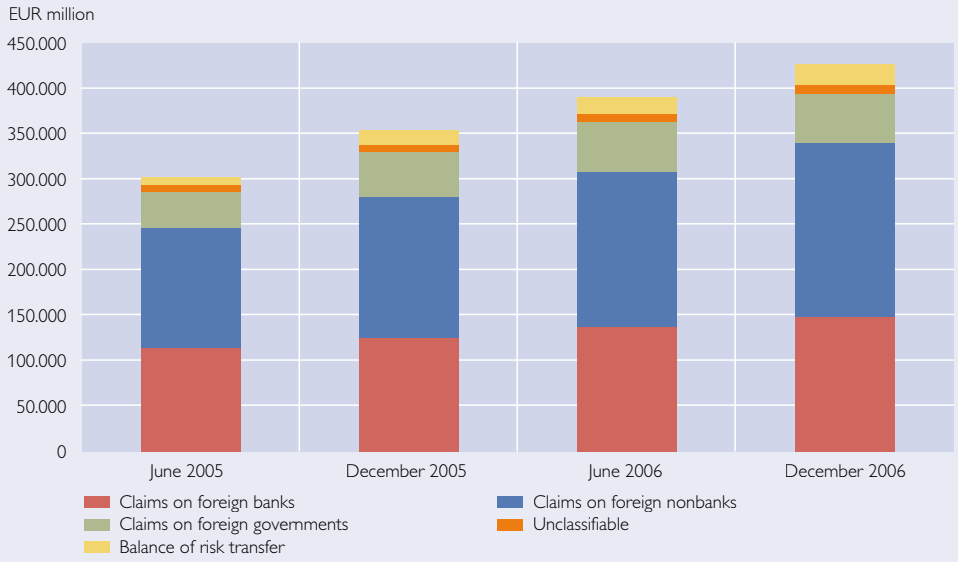
[1] *Bank Austria Creditanstalt AG (BA-CA), Bank für Arbeit und Wirtschaft und Österreichische Postsparkasse AG (BAWAG P.S.K.), Erste Bank der oesterreichischen Sparkassen AG (Erste Bank), Österreichische Volksbanken AG (ÖVAG) and Raiffeisen Zentralbank AG (RZB).*

Austrian Banks' External Assets

Given the internationalization of Austrian banks, which has been growing for years, and the related rise in external assets, country risk has become an increasingly important issue. In June 2005, Austrian banks for the first time submitted a detailed report on their external assets in the context of the residual maturity and risk statistics. This reporting requirement extends to banks with external assets in excess of EUR 100 million at year-end, and reporting is carried out at the highest possible level of consolidation. External assets are reported on a country-by-country basis and are allocated to the following sectors: banks, nonbanks, government and an "unclassifiable" category. In addition, risk transfer payments are reported (comprising guarantees, collateral and other transfer payments which are also related to equity interests and include off-balance-sheet transactions). Taking account of these risk transfer payments makes it possible to determine the ultimate country risk arising from external assets and the balance of risk transfer.

Chart 13

Development of Austrian Banks' External Assets from June 2005 to December 2006



Source: OeNB.

The consolidated external assets of Austrian banks climbed by 19.4% year on year, reaching EUR 404.7 billion at end-2006 (see chart 13). Growth in external assets was induced primarily by investments in and loans to nonbanks (+23.8%). The growth of external assets was highest in Central and Eastern Europe (CEE) as well as the Commonwealth of Independent States (CIS) which amounts to EUR 43.6 billion in absolute terms on a year-on-year basis, followed by Western Europe, where external assets augmented by EUR 20 billion in absolute terms. As at end-2006, Austrian banks' risk exposure increased by around 5.6% or EUR 22.6 billion, with Western Europe (+EUR 16.8 billion) and CEE and CIS countries (+EUR 5.0 billion) accounting for the bulk of this increase. It is evident that risk exposure is on balance being reduced particularly in countries whose ratings have deteriorated (noninvestment grade status), and that further increases in risk exposure are visible in countries that are rated as good or very good (investment grade).

[1] *External assets include, inter alia, loans to foreign borrowers as well as participating interests in enterprises abroad and investment abroad.*

[2] *Country risk indicators are provided by rating agencies that carry out complex assessments of a country's economic and political situation. The OeNB quantifies the risk inherent in external assets using the country risk ratings assigned by recognized rating agencies (Moody's, S&P, Fitch).*

nonbanks increased by 6.7% and 28.8%, respectively.

As for domestic business, claims on banks augmented by 6.2% in 2006, while claims on nonbanks continued to rise, posting the second-highest increase year on year since 1996 at 5.0%. The liabilities side reveals a similar picture: Liabilities to domestic banks increased by 6.7% (2005: 4.5%), whereas nonbank deposits registered somewhat more modest growth at 4.7%. In 2006, growth in direct domestic issues – albeit strong at 15.5% – did not reach the very high 2005 level of 22.7%. This area saw, above all, an increase in the number of bonds issued (17.8%) and of other securitized liabilities (13.4%).

After stagnating in early 2006, specific off-balance sheet transactions (derivatives business) grew by 10.2% in 2006 as a whole and amounted to EUR 1,660 billion by year-end.[2]

Austria's high banking density relative to the euro area declined slightly in 2006, following a long-term trend. The number of bank branches fell by 47 to 5,150 (–6% compared with 2000 when there were still 5,479 branches). The number of mergers across all sectors rose from 9 in 2005 to 13 in 2006, continuing the consolidation trend.

International Business Continues to Spur Growth

Whereas domestic profit growth slackened in 2006, CEE business fueled the Austrian banking sector's still dynamic profit growth.

In 2006, operating profit generated by the consolidated sector rose[3] by 18.9% to EUR 9.2 billion, reflecting buoyant CEE business growth. Despite robust growth in total assets, operating profit margins[4] widened slightly from 0.92% in 2005 to 1.0% in 2006. Moreover, the cost/income ratio decreased further from 63.3% in 2005 to 61.5% in 2006. At +13.4%, operating income grew much faster than operating costs (+10.2%). The key income driver was interest income, which accounted for more than one-half (59.3%) of total income growth. Lending and deposit taking in CEE was highly profitable, contributing substantially to income growth on a consolidated basis. Fee income was a slightly less significant growth driver, accounting for around 40% of total income growth. The growth contribution of trading income (a less significant component in the Austrian banking sector) came to some 2.4%, which was almost offset by a decline in other income to the same degree. Staff costs and administrative expenses accounted for two-thirds and one-third of growth in total operating expenses, respectively.

In 2006, credit risk provisions consumed 27.5% of operating profit, somewhat less than in 2005 (30%). At +62.8%, annual profits rose almost twice as fast as they did in 2005. However, net profits also reflected, inter alia, the disposal proceeds from

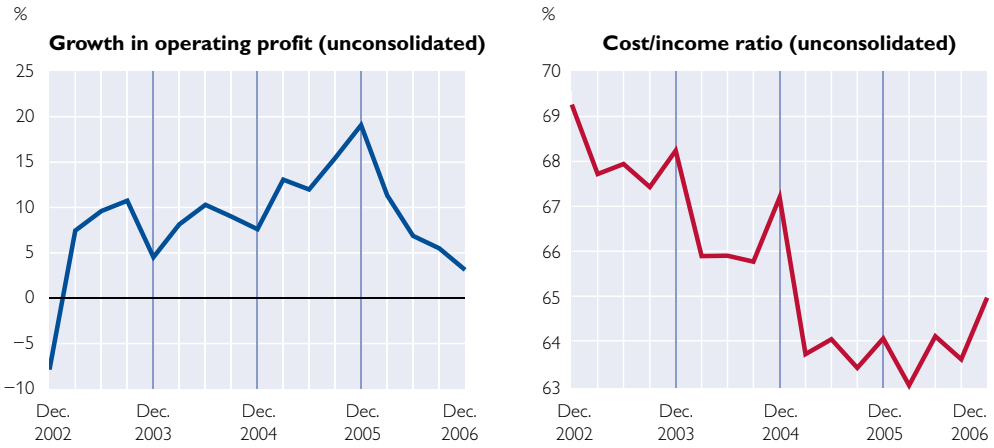
[2] *As the reported data is based on nominal values, it is not possible to make a clear statement about the riskiness of the derivatives business.*

[3] *The consolidated overall results may be slightly distorted, given that the aggregated data cover individual financial statements as well as group financial statements drawn up in compliance with the Commercial Code or the International Accounting Standards.*

[4] *Operating profit relative to total assets (consolidated).*

Chart 14

Operating Profit and Cost/Income Ratio



Source: OeNB.

Bank Austria Creditanstalt's participating interests in Poland and Croatia as a result of restructuring within the UniCredit group, raising the consolidated return on assets (ROA) from 0.63% in 2005 to 0.94% in 2006.[5]

Profit Growth in Domestic Business Slows Down

After improving steadily since 2002, profit growth in domestic business slowed in 2006. In unconsolidated business, which mirrors this growth, operating profit in 2006 rose by a mere 3% on the previous year, compared with 19% in 2005 (see chart 14). As a result, 2006 posted the lowest profit growth in domestic business since 2002. Furthermore, the unconsolidated cost/income ratio – following its historical low at 64.1% in 2005 – deteriorated somewhat, rising to 65.0% in 2006. At +6%, growth in unconsolidated operating income lagged behind growth in operating expenses (+7%) in 2006 for the first time since 2002.

Although unconsolidated net interest income rose by 1.1% year on year owing to robust lending growth in recent years, the interest margin narrowed by a further 9 basis points to 1.01% between end-2005 and end-2006. In addition, interest rates for new business do not indicate that the interest margin will widen in the future. The gap between interest rates for euro-denominated loans and deposits[6] has largely been just below 1% since mid-2006.

Weaker growth in domestic business is also attributable to the slowdown in unconsolidated net fee income growth in 2006, which rose by a mere 9% (2005: 16%). In addition, Austrian banks – after downsizing staff in recent years – significantly expanded employment measured in full-time equivalents (FTE)[7] in 2006, which is reflected in staff costs. After

[5] *Excluding these disposal proceeds by BA-CA, the ROA of domestic business in 2006 would be around the 2005 levels.*

[6] *Interest rates are calculated on the basis of the volume-weighted average of interest rates for all euro-denominated loans and deposits of households and nonfinancial corporations.*

[7] *Part-time employees are included on a pro rata basis.*

FTE employment had been cut from around 69,700 to some 65,400 between 2000 and 2005, it rose to about 66,500 in 2006. Some of this new employment is likely to be used for international business and, in particular, for the major banks' CEE business, but Austria's small banks have also taken on new staff as a result of the thriving economy.

Although CEE business continues to generate dynamic profit growth on the whole and some domestic cost increases may be attributable to international business, the improved profitability of domestic business in recent years must be further strengthened and deepened.

Sustained High Lending Growth

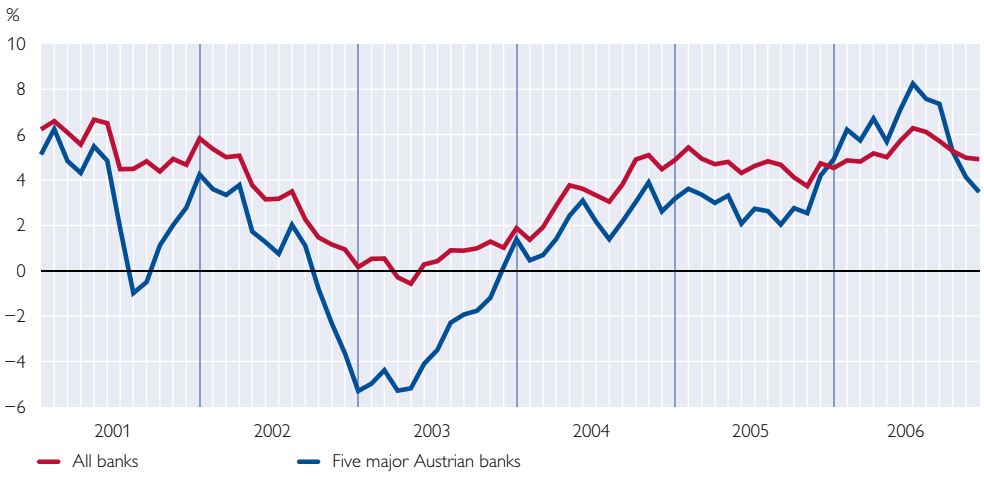
Although growth in lending to domestic households and nonfinancial corporations by banks operating in Austria slowed to 4.9% year on year in the fourth quarter of 2006, it still remains dynamic in historical terms. At just above 6%, corporate lending grew much faster than household lending, which expanded by more than 3%. In view of the ECB's increase in key interest rates in 2006, this development reflects the continued benign economic climate.

An analysis of Austria's five largest banks[8] reveals a far steeper slowdown in growth (especially for one of them), confirming the overall picture that the lending cycles of major banks are subject to sharper fluctuations.

An analysis of lending growth by individual banking sectors (excluding special purpose banks) shows robust annual growth in lending by Raiffeisen credit cooperatives (+6.6%) and mortgage banks (+7.2%) in 2006. By contrast, lending by joint stock banks (+2.8%) and savings banks (+1.9%) grew at a slower-than-average pace in 2006. Growth in lending by building and loan associations (+3.5%) followed the trend in general household lending growth.

Chart 15

Growth in Claims on Domestic Households and Nonfinancial Corporations



Source: OeNB.

[8] *BA-CA, BAWAG P.S.K., Erste Bank, ÖVAG and RZB.*

Share of Foreign Currency Loans To Households Remains High Despite Slight Decline

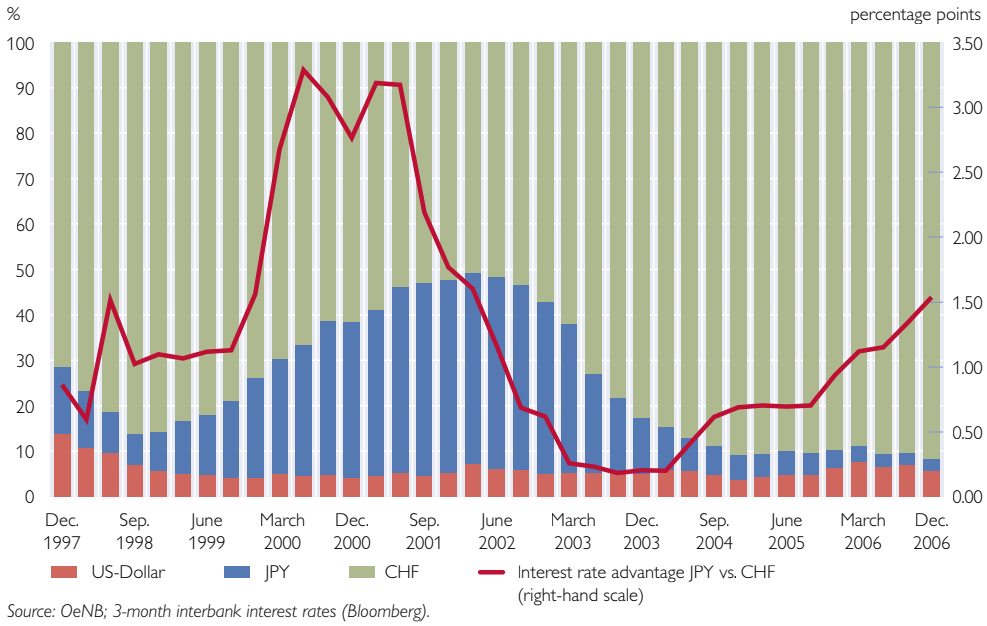
Despite a widening interest rate advantage of the Swiss franc and, above all, the Japanese yen over the euro in the money markets, foreign currency loans were somewhat less popular particularly in the second half of 2006. The volume of foreign currency loans issued to domestic nonbanks declined, as did their share as a percentage of total loans issued. At end-2006, EUR 52 billion in foreign currency loans was outstanding, which is equivalent to a share of 18.7% of total loans issued. This was primarily ascribable to the sustained trend of declining foreign currency corporate financing since 2002. Just a little less than 10% of corporate loans are denominated in foreign currency. Unlike in the past, the share of foreign currency loans to households failed to offset this decline, as households acted somewhat more cautiously, too, with the share of foreign currency loans to households shrinking slightly in 2006, albeit from a high level. Almost one-third of total household loans are still denominated in a foreign currency.

The Swiss franc remains the dominant foreign currency with a share of 91%. Only 3% of foreign currency loans were denominated in Japanese yen. Despite the long sustained widening of the yen's interest rate advantage over the franc (see chart 16), yen-denominated loans are currently stagnating at a low level. This also reflects an increase in borrowers' risk awareness.

In view of the still high share of foreign currency loans to households, in particular, the OeNB intends to continue highlighting the risks associated with foreign currency loans to both banks and borrowers.

Chart 16

Foreign Currency Lending by Austrian banks – Shares of Currencies



Source: OeNB; 3-month interbank interest rates (Bloomberg).

Foreign Currency Lending by Austrian Banks in Central and Eastern Europe

Foreign currency lending is not restricted to the domestic market, as this type of financing is also very popular in Central and Eastern Europe. Austrian banks' heavy investment in the CEE region means that, in addition to their foreign currency exposure at home, they are also subject to foreign currency exposure abroad. Foreign currency loans can be issued directly from Austria or indirectly via subsidiary banks based in the CEE region. In the Financial Stability Report 12, an attempt at an initial estimate of this exposure was made. Thanks to an OeNB survey of the largest Austrian banks in the region, empirical results on Austrian banks' foreign currency lending in CEE countries are now available.

The survey found that total foreign currency loans to nonfinancial corporations and households issued via subsidiaries amounted to EUR 39.7 billion as at June 2006.[1] This is equivalent to a share of foreign currency loans of 51.5% in relation to the total number of loans issued by the surveyed banks' subsidiaries. OeNB data show that foreign currency loans worth EUR 22.7 billion were issued directly from Austria.[2] Since these almost entirely involve euro-denominated corporate loans (issued to subsidiaries of Austrian companies, inter alia), the risk profile of direct loans differs considerably from that of loans extended indirectly via subsidiary banks.

In the context of rapid credit expansion in the CEE region, foreign currency lending grew particularly quickly, although the latest data indicate a slowdown in this growth. The key countries in the area of foreign currency financing by Austrian subsidiary banks are Hungary and Croatia, which account for some 37% of foreign currency loans issued indirectly via Austrian banks' subsidiaries. The Czech Republic plays a major role in the area of direct loans. Regarding currency allocation, the euro is clearly dominant, but CHF-denominated loans are already of major importance in some countries – especially in Poland, Hungary and Croatia.

Austrian banks account for a disproportionately high share of foreign currency lending in the national banking markets. Among other factors, this is likely to be attributable to their management experience of foreign currency loans in domestic business. For a definitive risk assessment of this exposure, however, the existence of natural hedges must also be taken into account (e.g. export revenues for nonfinancial corporations or foreign currency income for households). Given that reliable data on the existence of such hedges are not available, Austrian banks' foreign currency lending in the region requires close observation.

[1] *This amount includes EUR 2.1 billion in euro-denominated foreign currency loans in Slovenia which can no longer be classified as foreign currency loans on account of Slovenia's accession to the euro area.*

[2] *This amount also includes EUR 2.3 billion in euro-denominated foreign currency loans in Slovenia.*

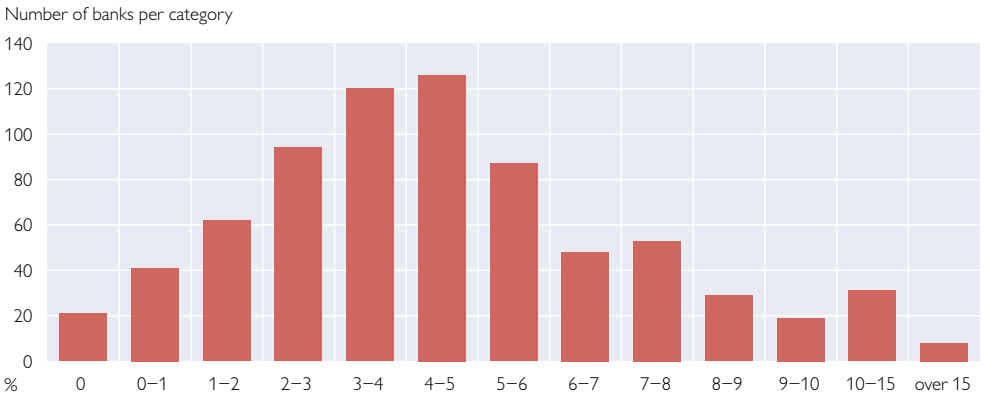
Credit Quality: Banks Still Expect Falling Default Rates

A continued improvement in lenders' assessment of credit quality is inferable from loss provisions for loans extended by banks operating in Austria. On an unconsolidated basis, the ratio of specific loan loss provisions to claims on domestic and foreign nonbanks dropped by 0.21 percentage point year on year, coming to 2.86% at end-2006.[9] This is the sharpest decrease in the ratio since it began declining in 2003. Thus, no trend reversal is discernible in banks' recently increasingly optimistic assessment of expected losses in their loan portfolio.

[9] *Data source: Banks' monthly balance sheet reports.*

Chart 17

Distribution of Banks with Respect to the Ratio of Specific Loan Loss Provisions for Claims on Nonbanks (end-2006)



Source: OeNB.

As before, a sectoral breakdown of specific loan loss provisions shows marked differences at end-2006. Volksbank (4.68%)[10] and Raiffeisen (3.66%) credit cooperatives posted traditionally high values, followed by savings banks (3.30%) and joint-stock banks (3.04%). By contrast, state mortgage banks (1.35%) as well as building and loan associations (0.47%) exhibited values that were well below average. Savings banks and state mortgage banks posted the strongest year-on-year declines in specific loan loss provision ratios for claims on nonbanks (0.26 percentage point, respectively), followed by Raiffeisen credit cooperatives (0.25 percentage point). Joint-stock banks and building and loan associations witnessed a decline of 0.14 and 0.02 percentage point, respectively, whereas Volksbank credit cooperatives registered a rise of 0.12 percentage point.

Chart 17 presents the distribution of banks operating in Austria with respect to their ratio of specific loan loss provisions for claims on nonbanks as at end-2006. To avoid distortions, banks with claims on nonbanks worth less than EUR 10 million are not included.[11] The median of this distribution is 4.31%, with most banks situated in the range between 4% and 5%. It is apparent from this that many smaller banks have higher ratios of specific loan loss provisions than the aggregate Austrian banking system. The eight banks with ratios exceeding 15% are all small banks, whose claims on nonbanks together account for a mere 0.14% of the aggregate banking system. For large and medium-sized banks, ratios of specific loan loss provisions are lower than that of the aggregate banking system: The 30 largest Austrian banks in terms of claims on nonbanks posted an aggregate ratio of specific loan loss provisions of 2.34%, more than one-half percentage point below that of the banking sector as a whole.

[10] *The definition of Volksbank credit cooperatives does not include Investkredit Bank AG and Kommunalkredit AG, which are classified as special purpose banks.*

[11] *These number 123 banks in all, which together account for less than 0.1% of total claims on nonbanks.*

Risks from Exposure to the Leveraged Buyout Market

Having started from a low base, Austrian banks have significantly increased their credit exposures for financing leveraged buyouts (LBOs) in recent years. The associated stability risk is, however, comparatively low. This finding emerged from a survey of three Austrian banks operating in this area, which was conducted by the OeNB within the framework of the Banking Supervision Committee (BSC) of the European System of Central Banks (ESCB). This initiative was prompted by dynamic growth in the LBO market, the recent sharp rise in financial leverage also via recapitalizations[1] and fiercer competition among the banks involved.

In general, an LBO is the takeover of a company by external financial investors, with the transaction being largely financed by debt. The investment horizon usually ranges between five and ten years, during which the investor endeavors to increase the value of the company, e.g. by restructuring, expansion or changes to its financial structure.

The survey results showed that the activities of the surveyed Austrian banks in the LBO segment are very strongly focused on lending. At end-June 2006, their total exposure including investment in LBO funds amounted to EUR 1.9 billion. Compared with EU banks surveyed, their LBO credit exposure was below the median value of 15% of tier 1 capital. The fact that LBO loans are almost entirely senior loans and that most were issued via syndicate business limits the risk arising from LBO financing activities. The banks surveyed also use various risk management tools, perform stress tests and stipulate enhanced borrower transparency.

On the basis of the survey's findings, the risks arising from these banks' LBO activities for financial stability in Austria appear to be low. Still, the performance of the LBO market and the banks' risk management will continue to be monitored closely, as will developments in the credit risk transfer market, which has contributed substantially to growth in the LBO market.

[1] *The enterprise acquired by financial investors distributes a special dividend, which is financed by raising debt.*

Market Risk: Flattening of the Yield Curve Accompanies the Reduction in Interest Rate Risk in the Banking Book

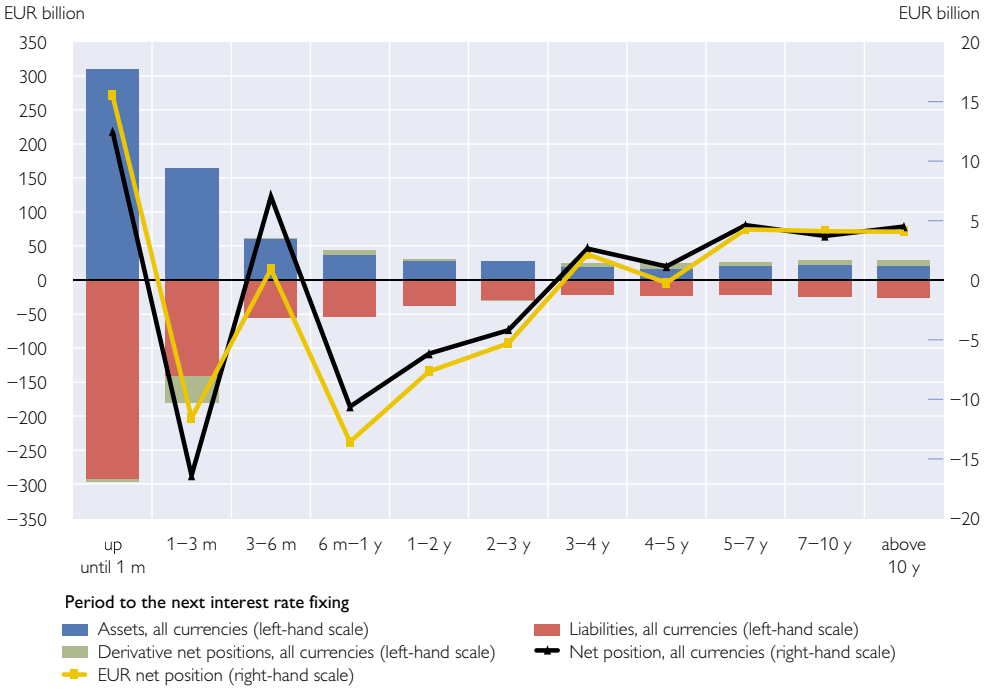
Banks' trading portfolio positions are subject to market risk, i.e. to possible changes in value owing to fluctuations in risk factors such as interest rates or stock prices. Further market risks arise for banks via the interest rate risk in the banking book and the foreign currency risk from open foreign exchange positions.

At end-2006, 27 banks operating in Austria were engaged in substantial securities trading and were thus subject to the relevant regulatory capital requirements. At the level of the banking system, the share of regulatory capital requirements to cover market risk in the securities trading book as a percentage of total capital requirements was 4.0% on average in 2006, only slightly down by 0.1 percentage point compared with 2005. This low share highlights the limited risk inherent in Austrian banks' trading portfolio relative to the loan portfolio. As in the past, interest rate instruments accounted for by far the largest share of these capital requirements, coming to between EUR 700 million and EUR 800 million in 2006 (as at year-end: EUR 737 million), with historically relatively small fluctuations. Capital requirements for equity positions fluctuated during the year, ranging between EUR 85 million and EUR 115 million (year-end: EUR 101 million).

Given a rising yield curve, banks can generate structural profit contri-

Chart 18

Breakdown of Interest Rate-Sensitive Positions by the Period to the Next Interest Rate Fixing (end-2006)



Source: OeNB.

butions by performing positive maturity transformation, which involves funding long-term assets with short-term liabilities. This additional possibility of generating revenue is accompanied by an additional risk in the form of the interest rate risk in the banking book. Chart 18 presents the aggregate Austrian banking system's assets and liabilities according to the period to the next interest rate fixing.[12]

The resulting interest rate risk profile reveals a positive maturity transformation for the aggregate Austrian banking system. However, this transformation is less pronounced than it was in early 2006, which suggests that banks have responded to the flattening of the yield curve that occurred during the year, and especially to that of the euro area, reducing the interest rate risk in the banking book commensurate with the lower structural profit potential. This is supported by the trend in the asset-weighted average of the Basel ratio for the interest rate risk[13] of all banks operating in Austria. After a modest decline from 6.6% to 6.3% in the first half of the year, this indicator fell to a historical low of 5.6% at year-end.

Recently, the foreign currency risk arising from open foreign ex-

[12] *This analysis is based on supervisory data from the interest rate risk statistics. Included in the description are all interest rate-sensitive on- and off-balance sheet positions as well as non-interest rate-sensitive on-balance sheet positions whose performance is assessed on the basis of market interest rates.*

[13] *This is the ratio of a bank's estimated present value loss of positions reported in the interest rate risk statistics, which arises in the event of a parallel 200 basis point shift in the yield curves of all currencies relative to the bank's eligible capital.*

change positions – measured by regulatory capital – has declined somewhat. After increasing modestly to EUR 102 million in the first half of 2006, capital requirements declined to EUR 75 million in the second half of the year.

New EU Legal Framework for Cashless Payments

Following intensive negotiations, the European Parliament and the Ecofin Council adopted the Directive on payment services in the internal market in spring 2007. With this Payment Services Directive (PSD) – which was developed as part of the SEPA project[14] – the EU aims at creating a single legal framework for cashless payments (credit transfers, direct debits, credit card payments, etc.) within the internal market. Basically, the Directive's provisions aim at increasing transparency and strengthening the rule of law (standardized disclosure requirements, execution times, liability, etc.); in addition, the Directive created a new payment service provider category, the so-called payment institution, and laid down a set of prudential requirements for the different scopes of their activities. The Member States are to transpose the PSD into national law by November 1, 2009.

The Directive focuses primarily on electronic payments as an alternative to the relatively expensive cash payments. In this respect it has to be stressed that in Austria the volume of electronic payments has developed quite dynamically to date. The OeNB-operated large-value payment system ARTIS/TARGET,[15] the various small-value payment systems (used for transferring customer payments) and the international payment systems used by Austrian banks have all reported consistent rises in both the volume and value of transactions processed in recent years (ARTIS payments, for example, increased by about 25% in volume and by around 40% in value compared with the first half of 2004). Only securities settlement systems saw an interruption of this trend in the second half of 2006, which can be attributed to a temporary fall in the price of securities at the Vienna stock exchange in May and June 2006.

In the second half of 2006, a total of 37 system disturbances[16] was reported for the payment and securities settlement systems overseen by the OeNB, which is slightly less than in the second half of 2005 (40 system disturbances). Access to ARTIS was interrupted once, and access to an international payment system was unavailable three times for an Austrian bank. The other system disturbances were temporary disruptions (between 35 minutes and 6 hours) during the business hours of one card payment system, one electronic money system and three smaller infrastructure providers, which handle only around 0.1% of all customer payments. However, none of these disturbances had a negative impact on the Austrian finance system.

[14] *SEPA: Single Euro Payments Area.*

[15] *ARTIS: Austrian Real-Time Interbank Settlement; TARGET: Trans-European Automated Real-time Gross settlement Express Transfer.*

[16] *System disturbance is defined as unavailability of the payment system for more than 30 minutes during business hours or within the last 30 minutes before settlement cut-off.*

Potential Regulatory and Supervisory Reforms of Banks' Liquidity Risk Management

In 2006, the Basel Committee for Banking Supervision set up a working group on liquidity risk management (Liquidity Group). Already in 2005, the European Commission had announced a study on banks' liquidity management practices and a comparison of national supervisory requirements. A joint task force of the Commission and the European System of Central Bank (ESCB) is to present its results in fall 2007. The banking industry has itself called for reforms in this area: Both the European Banking Federation (EBF) and the International Institute of Finance (IIF), for instance, have published working papers on the topic.

How to explain the current interest in reforming liquidity management? First, despite a number of reforms to regulate the banking sector (e.g. Basel II, EU Financial Services Action Plan) this area has largely been neglected up until now. Second, studies on the structure of banks' short- and medium-term financing show that banks' liquidity risk has increased and that risk management has become more complex.[1] In this context the following questions arise:[2]

(1) How to reform liquidity regulations so that they accommodate the varying liquidity risks of individual institutions and at the same time guarantee an efficient supervision? (2) Since liquidity regulations are not harmonized within the EU and supervision of subsidiaries is subject to the host country principle, the question arises whether liquidity regulations should be harmonized and whether the liquidity supervision of subsidiaries should be made subject to the home country principle.

Since banks' liquidity risk management might impact on the tasks of central banks, the OeNB engages in these reform discussions at all levels. Liquidity problems of individual banks could result in negative external effects, which in turn could affect the liquidity and efficiency of the money market and thereby make it more difficult for central banks to fulfill their essential tasks.[3] Therefore, from the OeNB's point of view, an adequate regulatory framework would have to meet two basic requirements: It should be able to internalize negative external effects, and it should be flexible enough to provide for appropriate liquidity risk management at individual institutions.

[1] *Basel Committee on Banking Supervision – Joint Forum. 2006. The Management of Liquidity Risk in Financial Groups. Basel: BIS. May; ECB – European Central Bank. 2002. Developments in Banks' Liquidity Profile and Management. Frankfurt/Main. May; ECB – European Central Bank. 2006. EU Banking Structures. Frankfurt/Main. October.*

[2] *European Banking Federation – EBF. 2006. Supervision of Banks' Liquidity Management. Discussion Paper W6298IEW. Brussels; International Institute of Finance – IIF. 2007. Principles of Liquidity Risk Management. Washington D.C.; Basel Committee on Banking Supervision – Joint Forum. 2006. Basel.*

[3] *Schmitz, S. W. and A. Ittner. 2007. Why is Liquidity Risk Management a Concern for Central Banks? Central Banking Vol. XVII. No. 4, 32–40.*

Central and Eastern European Countries Still Gaining Importance for the Austrian Banking Market[17]

According to the business segment reports of the six major Austrian banks active in Central and Eastern Europe[18], total assets in this segment have grown to around EUR 188 billion on a consolidated basis, thus accounting for 20.3% of the Austrian banking system's consolidated total assets in December 2006. Pretax profits before adjustment for special factors improved as well to around

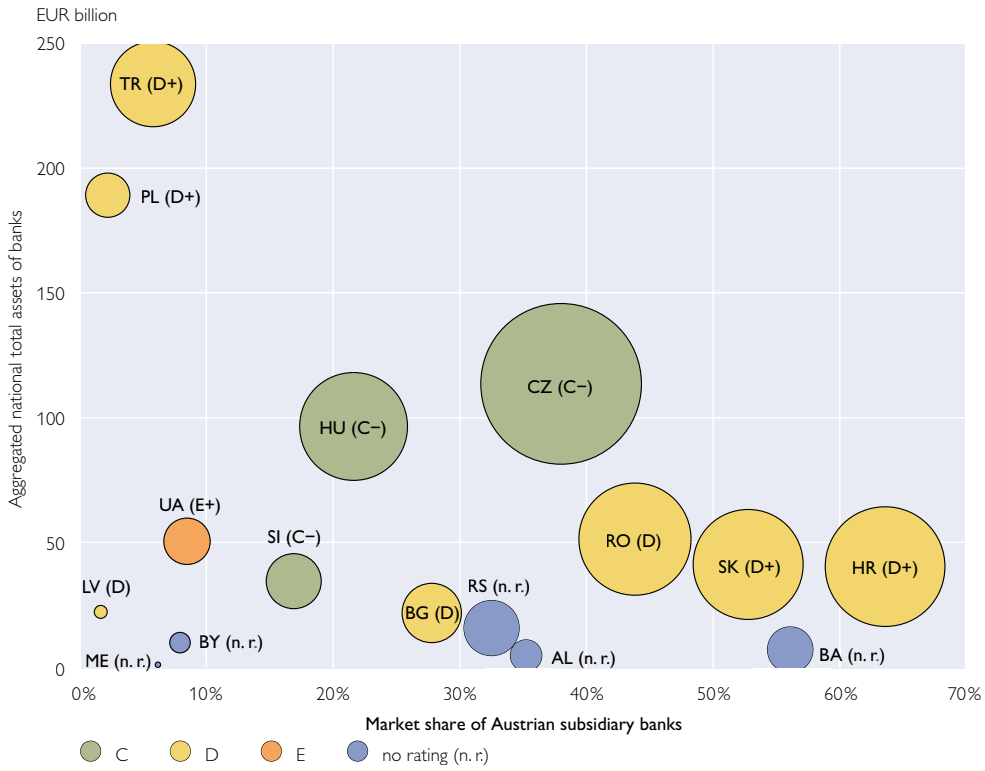
[17] *Mainly on the basis of quarterly reports on condition and income submitted by Austrian banking groups since early 2002. These reports contain selected items from the consolidated annual reports of parent banks and their fully consolidated subsidiaries abroad. Additional sources, like annual reports or market research data, supplement the analysis where indicated.*

[18] *BA-CA, BAWAG P.S.K., Erste Bank, Hypo Alpe Adria International, ÖVAG and RZB.*

Chart 19

Market Share of Austrian Subsidiary Banks in CEE[1]

Extrapolation 2007



Source: BankScope, national central banks, OeNB, Moody's.

[1] *Because of the size of the Russian banking sector (around EUR 413 billion as at December 2006) the chart does not show Russia, where at the end of 2006, Austrian subsidiary banks held a market share of around 3.8%.*

Note: The chart shows the individual countries according to the Austrian subsidiary banks' market share (x scale) and the aggregated total assets of the national banking industry (y scale). The size of the circle corresponds to the total exposure of Austrian banks vis-à-vis the respective country. The countries are colored according to Moody's average bank financial strength (BFS) rating (A–E).

EUR 2.8 billion, as a result of which the CEE segment made up already 38.7% of the consolidated pretax profit of all Austrian banks at the end of 2006.

In total, 11 Austrian banks with 62 fully consolidated subsidiaries operated in this market as at December 31, 2006. 29 of these subsidiaries are situated in the new EU Member States which joined in 2004 (NMS-2004[19]), 8 in EU Member States which joined in 2007 (NMS-2007[20]), 20 in other Southeastern European countries (SEECs[21]) and 5 in the Commonwealth of Independent States (CIS[22]). In addition, there is the Turkish joint venture of the Italian UniCredit Group, which, following the restructuring of the banking group's CEE

[19] *NMS-2004: the Czech Republic (CZ), Hungary (HU), Latvia (LV), Poland (PL), Slovakia (SK) and Slovenia (SI).*

[20] *NMS-2007: Bulgaria (BG) and Romania (RO).*

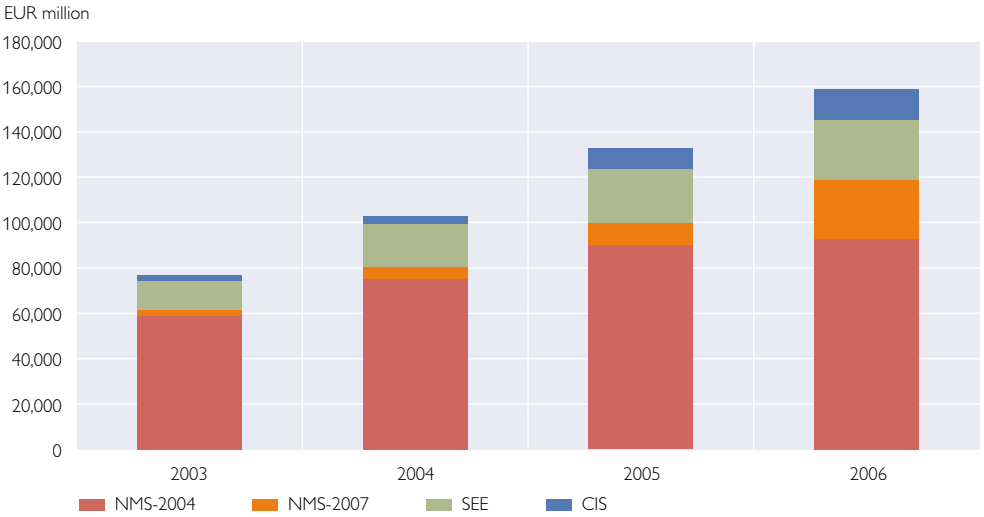
[21] *SEE: Albania (AL), Bosnia and Herzegovina (BA), Croatia (HR), Montenegro (ME) and Serbia (RS).*

[22] *CIS: Russia (RU), Ukraine (UA) and Belarus (BY).*

Chart 20

Total Assets of CEE Subsidiary Banks

As on December 31, 2006



Source: OeNB.

segment, is now being supervised by the Austrian bank BA-CA, and seven other banks in seven CEECs,[23] which were not considered in the end-of-December-2006 reports as the restructuring had not been formally finalized when the accounts were closed for 2006. Together with these subsidiaries Austrian banks hold already around 14.5% of the total CEE banking industry (see chart 19) or, excluding Russia and Turkey, even around 23.7%.

A look at the data reported by the fully consolidated subsidiary banks in CEE shows a clear focus on the new EU Member States. With 58.5% (NMS-2004) and 16.4% (NMS-2007) of the aggregated total assets as at the end of 2006, a total of around EUR 118.9 billion have been generated within the EU (see chart 20); 16.6% (about EUR 26.3 billion) in SEE countries and 8.5% (about EUR 13.5 billion) in CIS countries. Accordingly, these figures correspond to a total increase of 19.3% against 2005. The decline of the growth rate by 10.3 percentage points is attributable to the above-mentioned restructuring of the BA-CA,[24] the effects of which could neither be offset by the dynamic growth in CEE nor by new purchases. In this respect, major differences between the individual groups of countries become apparent. Rapid growth of the NMS-2007, for example, is mainly attributable to the fact that Erste Bank reported its Romanian subsidiary bank BCR for the first time.

The same effects can be observed as regards aggregated operating profits of CEE subsidiary banks, which increased by 14.0% to around EUR 2.8 billion in 2006 (see chart 21),

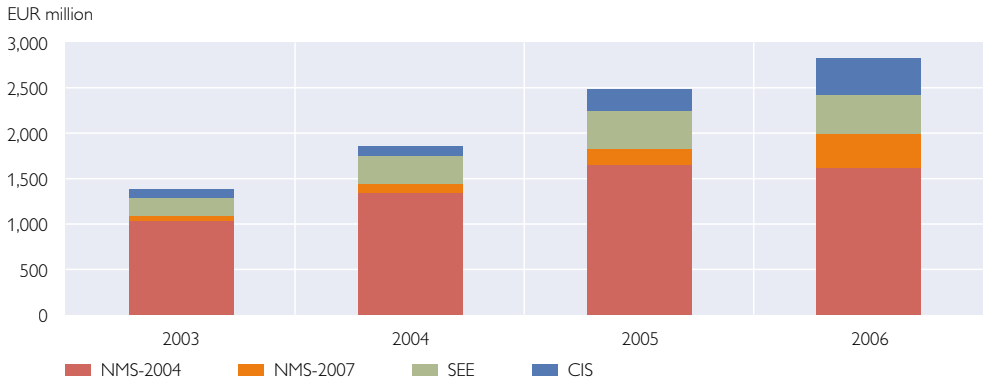
[23] *Bulbank (BG), Zivnostenska (CZ), Zagrebacka (HR), UniCredit (LV), UniCredit Romania (RO), IMB (RU) and Unibanka (SK).*

[24] *More precisely the fact that the internal group sale of the Polish BPH and the Croatian Splitska Banka was not timed with the purchase of the eight banks mentioned earlier.*

Chart 21

Operating Profits of CEE Subsidiary Banks

As on December 31, 2006

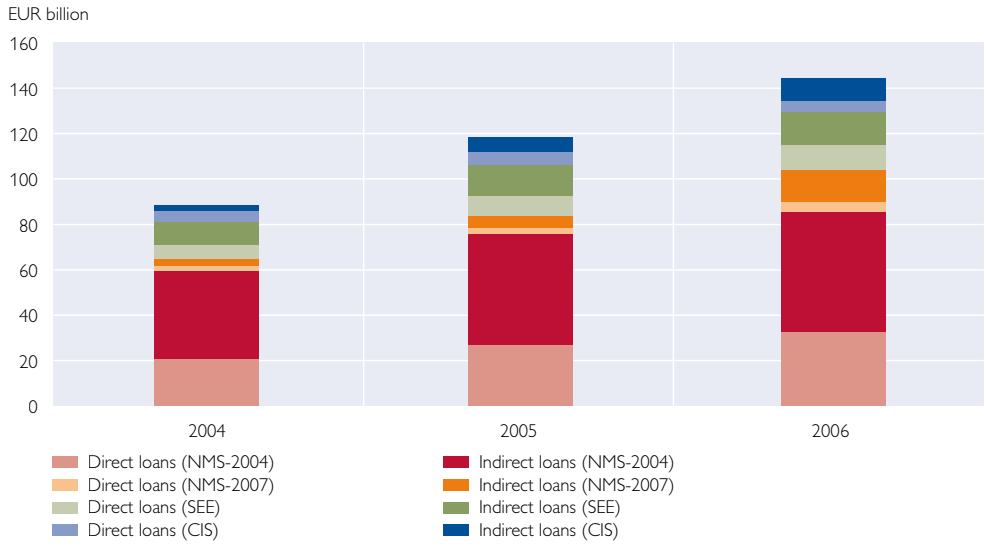


Source: OeNB.

Chart 22

Credit Exposure to CEECs

As on December 31, 2006



Source: OeNB.

57.1% of which can be attributed to the NMS-2004, 13.4% to the NMS-2007, 15.2% to other SEE countries and 14.2% to members of the CIS. Despite similar growth rates of their total assets (around 20%), non-EU subsidiary banks recorded more dynamically growing operating profits (28.2%) than their EU-based counterparts (8.9%). Yet higher returns also imply significantly higher risks.

In December 2006, the cost/income ratio[25] of the fully consolidated CEE subsidiary banks remained at the

[25] *Ratio of administrative costs to operating income before deduction of net risk provisioning in the lending business.*

level of 56.7% observed in December 2005. While subsidiary banks within the EU saw their cost/income ratios improving by 1.6 percentage points to 56.3%, the ratio deteriorated on average by 4.5 percentage points to 57.6% in non-EU countries, thereby offsetting the positive trend; recent purchases of the latter being one reason for this development. Yet once the integration process will be completed, cost/income ratios are expected to fall again.

As regards indirect credit exposure[26] of Austrian banks vis-à-vis CEE, the new EU Member States hold a unique position at 73.2% of the total credit volume of EUR 91.7 billion (NMS-2004: 57.9%, NMS-2007: 16.3%), which corresponds to a growth rate of 24.7% (see chart 22). This is contrasted by SEE countries, where loan growth only seemed to stagnate[27], as they currently report an indirect credit volume of EUR 14.8 billion, and by CIS countries where growth was above 50% amounting to EUR 9.8 billion.

In 2006, the growth of existing subsidiary banks together with the increasing volume of direct lending[28] added yet again to the rising exposure in CEE.[29] Similar to subsidiary bank data, loans to EU Member States account for the larger share of the total lending volume of EUR 52.5 billion (see chart 22). With a total growth rate of 19.1% (disregarding upward outliers) direct lending amounted to 62.1% in NMS-2004 and 7.9% in NMS-2007. About the same amount of direct lending goes to borrowers from the CIS (around EUR 4.8 billion) and more than twice the amount to SEE (around EUR 11.0 billion). A considerable share of credit exposure was denominated in another currency than the respective national currency.[30]

Stress tests simulating the effects of extreme shocks to the Austrian banking system are a valuable tool to quantify the risk of the CEE banking markets for Austria. The goal of these tests is to establish the resilience of the Austrian banking system to an extreme deterioration of the loan quality of the foreign subsidiary banks. The scenario that is used goes deliberately beyond historic worst case scenarios, as currently dynamic markets feature only low NPL quotas[31] (NPLs above the total sum of loans to nonbanks). Furthermore, it is assumed that a shock would hit all countries of the region at the same time. The results of these tests show that the Austrian banking sector would even be able to absorb a shock multiplying the current NLP volume at many subsidiary banks. In this scenario, the banking system's consolidated capital ratio would fall from

[26] *Loans given out by subsidiary banks in other countries.*

[27] *Indirect loans granted by SEE subsidiary banks increased by around 6% year on year. Yet the sale of Splitska Banka distorts this result; adjusted for loans granted by this bank in 2005, the growth rate amounts to about 23%.*

[28] *Loans granted by Austrian banks to borrowers resident in other countries.*

[29] *Contrary to the examination of indirect loans, the examination of direct loans comprises all countries of the respective region (i.e. also those without local subsidiaries). Consequently, the SEE region also includes Macedonia and all 12 member countries of the CIS.*

[30] *See above, box on 'Foreign Currency Lending by Austrian Banks in Central and Eastern Europe'.*

[31] *NPL: Non-performing loan.*

11.61% to 10.66% at the end of 2006; i.e. it would still remain well above the statutory 8% threshold, even though particularly one bank, which had operated close to the minimum capital requirement, would drop below this 8% threshold. Moreover, the good performance of Austrian subsidiary banks in CEE serves as an additional buffer that could absorb adverse developments.[32] As the capital figures at year end had to be reported in January, they did not yet reflect banks' profits for 2006 and their good performance in CEE; current capital figures including these are higher however. Yet banks which are particularly exposed to CEE should take into consideration their rapid asset growth in their capital adequacy policies.

The region's fast loan growth, also in the foreign currency sector, constitutes a considerable challenge to banks' risk management as banks have to prevent the accumulation of hidden credit risks. Yet the fact that the exposure of Austrian banks is mostly concentrated to CEECs within the EU limits particularly legal, institutional and therefore also economic risks.

Banks in Central and Eastern Europe: Strong Credit Growth Continues

Interrelated with robust real economic growth in most of the analyzed countries, growth (adjusted for inflation) of domestic credit to private nonbanks accelerated or stabilized at a relatively high level. Recent credit growth rates typically reached between 17% and 25% year on year in most countries and even reached almost 50% in Romania. The sole exception to this trend was Hungary where real growth of domestic credit to private nonbanks dropped to 15% in the fourth quarter of 2006 as a result slower growth in foreign currency credit together with a moderation in domestic demand. Given the dynamic development of domestic credit to private nonbanks, the annual increase in lending in relation to GDP[1] also rose in all countries including Hungary in the second half of 2006.[2] During the same period, Bulgaria also saw increased credit activities, although credit growth remained markedly below the high levels of 2005.Despite the measures taken over the past few years by their respective central banks to limit credit growth, it gathered momentum in Romania and Croatia. At the beginning of 2007, the Croatian National Bank tightened its measures by introducing new credit ceilings, whereas the Bulgarian and Romanian central banks loosened selected (administrative) borrowing constraints as of January 2007, which has been attributed pertly to their EU accession, partly to the success or increasing ineffectiveness of these measures.

[1] *Measured as the nominal change in outstanding loans compared with the same quarter of the previous year in percent of GDP of the respective four quarters.*

[2] *At the same time, growth of cross-border loans to private nonbanks picked up in the second half of 2006 in most countries except in Poland (stable low growth) and Hungary (markedly declining growth). Compared with the growth of domestic loans, the increase of external loans was particularly relevant for Bulgaria and Croatia.*

[32] *For a detailed description of the CEE stress tests see Boss, M., G. Krenn, C. Puhr and M. Schwaiger (2007) "Stress Testing the Exposure of Austrian Banks in Central and Eastern Europe" in this volume.*

Slovenia was the only country in which the high and/or accelerating growth of domestic loans led to a more pronounced decline (4% of GDP) in banks' net external asset position in 2006. In Poland, the Czech Republic, Romania and Croatia this position fell only between 0.5% and 1.5% of GDP, while it went up slightly in Hungary and picked up strongly in Bulgaria and Slovakia (by 4% and 10% of GDP respectively). As regards Bulgaria, this development can mainly be attributed to the rise in external assets, which might partly reflect loan transfers to foreign parent banks. At the end of 2006, banks' net external assets stood between −5% and −20% of GDP in Slovenia, Croatia, Hungary and Slovakia, was balanced in Romania and reached between 2.5% and 10% of GDP in Bulgaria, Poland and the Czech Republic.

The declining share of foreign currency loans in outstanding lending to businesses and households in Hungary, Croatia and Romania as well as the stabilization of this share in Bulgaria have mitigated the risks. In the first three countries measures taken by their respective central banks may have promoted this trend (e.g. recommendations for improving credit risk management in Hungary; assigning higher risk weights for foreign currency loans to unhedged borrowers and applying more comprehensive reporting requirements in Croatia; limiting foreign currency loans to unhedged loan borrowers in percentage points of banks' equity in Romania − this measure has already been lifted again). In Hungary, currency turbulences in May and June 2006 seem to have made banks and borrowers more aware of the risk related to foreign currency loans, whereas these became increasingly popular in Poland and Slovenia in 2006. In Poland this trend was primarily linked to housing loans, while in Slovenia it was promoted by the introduction of the euro. At the end of 2006, the foreign currency share in outstanding loans to businesses and households stood between 45% and 50% in Bulgaria, Romania and Hungary, was very high in Slovenia (more than 60%) and Croatia (70% including loans indexed to foreign currencies) and reached 30% in Poland. With the exception of Slovenia, this development constitutes a risk to the financial stability as unfavorably developing exchange rates together with increasing foreign interest rates could have a negative impact on borrowers' solvency, particularly since households and small and medium-sized enterprises (SMEs) might not be adequately covered against such risks.

In 2006, nominal and real banking sector profitability in CEE reached the highest levels in Poland, the Czech Republic and Hungary. Polish, Slovakian and Bulgarian banks were able to increase their nominal return on equity, while the indicator decreased in the Czech Republic, Hungary, Croatia and Romania. As a result of continuous strong expansion of credit to businesses and households, the capital adequacy ratios continued to decline in all countries; in Croatia they also declined as a consequence of tightened provisions for the calculation of risk-weighted assets. Yet capital adequacy ratios still remained at a double-digit level and constituted adequate buffers against a broad range of risk according to the IMF's and NCBs' stress tests. However, the resilience to shocks has not been put to any "real life" test (strong economic recession or permanent substantial depreciation of the currency) in the recent past. Moreover, since loans grow robustly, information on the portfolio quality has to be interpreted more cautiously (strongly expanding denominator, "young" portfolios, limited data on borrowers' loan history, strong competition to gain new customers). In Hungary, for example, authorities reckon that due to unfavorable economic conditions the need for loan loss provisioning will rise in 2007, which − together with the expected declining demand for loans and the increasing competition among financial service providers both in the lending and deposit business − might have a negative impact on the banks' performance.

Nominal Return on Equity (after Tax)

%

	2003	2004	2005	2006	H1 05	H1 06
Bulgaria	**14.8**	**16.6**	**18.4**	**20.2**	18.6	18.1
Croatia	**14.5**	**16.1**	**15.6**	**12.7**	14.5	14.7
Poland	**5.5**	**17.4**	**24.0**	**27.2**	21.2	28.0
Romania	**17.7**	**17.7**	**15.1**	**12.1**	19.7	14.2
Slovak Republic	**10.5**	**12.3**	**13.4**	**15.7**	14.6	16.4
Slovenia	**8.2**	**8.7**	**11.1**	. .	. .	. .
Czech Republic	**23.4**	**23.1**	**24.9**	**22.2**	29.3	24.8
Hungary	**18.7**	**23.8**	**23.2**	**21.6**	27.3	23.1

Note: Based on profit after tax.

Net Interest Income

% of annual average bank assets

	2003	2004	2005	2006	H1 05	H1 06
Bulgaria	**4.7**	**4.9**	**4.5**	**4.2**	4.4	4.3
Croatia	**3.3**	**3.0**	**2.9**	**2.7**	3.0	2.8
Poland	**3.1**	**3.2**	**3.1**	**3.2**	3.1	3.2
Romania	**4.7**	**4.8**	**3.5**	**3.3**	3.7	3.2
Slovak Republic	**2.9**	**2.9**	**2.2**	**2.4**	2.2	2.2
Slovenia	**3.2**	**2.8**	**2.5**	. .	2.7	. .
Czech Republic	**2.1**	**2.3**	**2.2**	**2.3**	2.3	2.2
Hungary	**4.0**	**4.3**	**4.1**	**3.6**	3.9	3.7

Operating Costs

% of annual average bank assets

	2003	2004	2005	2006	H1 05	H1 06
Bulgaria	**4.5**	**4.2**	**3.6**	**3.4**	3.5	3.5
Croatia	**2.6**	**2.3**	**2.2**	**2.1**	2.2	2.1
Poland	**3.9**	**3.7**	**3.7**	**3.3**	3.7	3.3
Romania	**6.9**	**6.1**	**5.4**	**5.0**	5.3	5.0
Slovak Republic	**2.6**	**2.4**	**2.1**	**2.1**	2.1	2.0
Slovenia	**2.9**	**2.7**	**2.5**	. .	2.4	. .
Czech Republic	**1.9**	**1.9**	**1.8**	**1.8**	1.8	1.7
Hungary	**3.4**	**3.3**	**3.1**	**2.7**	2.8	2.6

Net Change in Loan Loss Provisions

% of annual average bank assets

	2003	2004	2005	2006	H1 05	H1 06
Bulgaria	**0.3**	**0.7**	**0.8**	**0.3**	0.9	0.4
Croatia	**0.3**	**0.3**	**0.2**	**0.2**	0.2	0.2
Poland	**0.9**	**0.4**	**0.2**	**0.2**	0.3	0.2
Romania	**0.6**	**0.7**	**0.5**	**0.6**	0.2	0.3
Slovak Republic	**−0.5**	**0.2**	**−0.1**	**0.2**	0.0	0.1
Slovenia	**0.8**	**0.7**	**0.7**	. .	0.8	. .
Czech Republic	**0.0**	**0.4**	**0.5**	**0.5**	0.3	0.4
Hungary	**0.3**	**0.5**	**0.3**	**0.4**	0.1	0.4

Nonperforming Loans

% of total loans

	2003	2004	2005	2006	H1 05	H1 06
Bulgaria	**4.2**	**3.6**	**2.8**	**2.2**	2.8	2.7
Croatia	**5.1**	**4.6**	**4.0**	**3.2**	4.3	3.6
Poland[1]	**21.2**	**14.7**	**11.0**	**7.3**	13.2	9.4
Romania	**8.3**	**8.1**	**8.3**	**8.0**	8.2	8.4
Slovak Republic	**9.1**	**7.0**	**3.7**	**3.3**	4.7	3.7
Slovenia	**6.5**	**5.5**	**4.7**	. .	5.3	. .
Czech Republic	**5.0**	**4.1**	**4.0**	**3.8**	4.3	3.8
Hungary	**2.7**	**2.7**	**2.5**	**2.5**	2.6	2.4

[1] *The nonperforming loans for Poland comprise nonperforming loans in the narrow sense as well as so-called irregular claims.*

Source: NCBs.
Note: Data are not comparable between countries. Intrayear data are annualized linearly.

Capital Ratio Declines Slightly

A credit institution's risk-bearing capacity is largely determined by its capital ratio, i.e. the amount of capital it holds in relation to risk-weighted assets. In the first quarter of 2006 the consolidated capital ratio for all Austrian banks grew by 1 percentage point against the previous quarter, reaching 12.7%. In the course of the year, however, it slightly declined and ultimately came to 11.6% at the end of the fourth quarter (see chart 23), which broadly corresponds to the comparable value of the previous year.

The rise in the capital ratio recorded in early 2006 was mainly attributable to the acquisition-driven capital increase of one major bank. The relevant acquisition was entered into the books in the fourth quarter of 2006, which reduced not only the capital ratio of the involved bank but, given the bank's size, also that of the entire banking sector. Accordingly, the average capital ratio of the five largest banks dropped to 10.1% in the last quarter of 2006, which actually corresponds to the value recorded in the same quarter of 2005. By international comparison, the average capital ratio of Austria's largest banks was lower than the average value calculated for a representative sample of major banks in the euro area.[33] However, this was to a large part attributable to the low capital ratio of one large Austrian bank which hit the news last year[34] and which was recently taken over by new owners. Furthermore, one has to take into consideration that retained earnings for 2006, which were particularly high in the case of large banks operating in Central and Eastern Europe, were not yet included in the capital ratios reported at year-end.

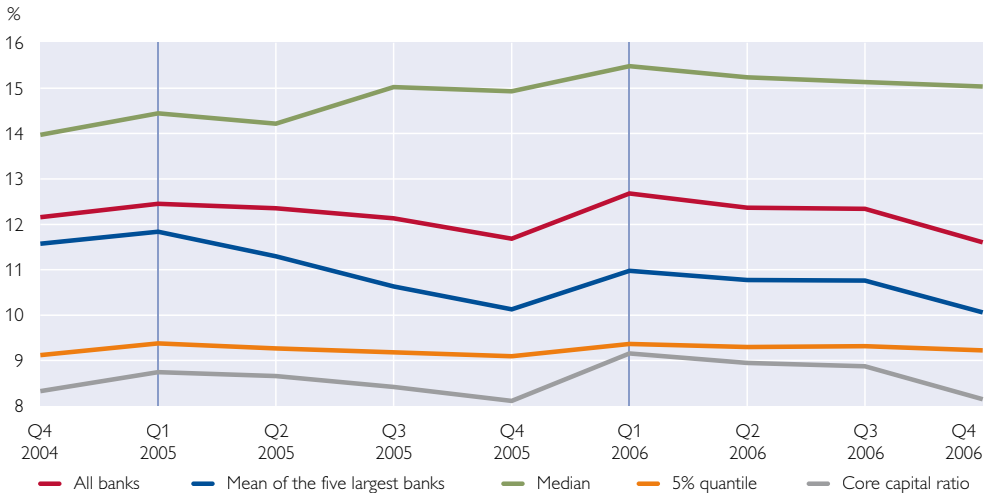
The median capital ratio of all Austrian banks also slightly deteriorated in the course of 2006, but still reached 15.0% at the end of the

[33] *Based on a representative sample of large banks operating in the euro area, the December 2006 ECB Financial Stability Review lists an average capital ratio of 11.3% for mid-2006.*

[34] *See related box in Financial Stability Report 11 (page 45).*

Chart 23

Austrian Banks' Consolidated Capital Ratio



Source: OeNB.

fourth quarter of 2006. In other words, the majority of Austrian banks continued to record solid capital ratios. The overall sound capital adequacy of Austrian banks is also confirmed by the core capital ratio, i.e. tier 1 capital (core capital) in relation to risk-weighted assets. At end-2006 the consolidated core capital ratio of all Austrian banks was 8.1%.

To sum up, the capital ratio of Austrian banks may have declined slightly, but is still satisfactory.

Austrian Banking Sector's Resilience to Shocks Remains Satisfactory

Financial stability analysts rely on stress tests to quantitatively assess the risk-bearing capacity of a financial system under hypothetical crisis scenarios. In this context, the OeNB has developed the Systemic Risk Monitor (SRM), a software for quantifying the systemic risk in the Austrian banking sector and for conducting corresponding stress tests.

Within the framework of a Monte Carlo simulation, the SRM yields a multitude of different scenarios which outline the possible development of relevant risk factors[35] over the following quarter. Based on each scenario, the profit/loss for every bank is calculated; the calculated values are then aggregated to assess the profit/loss for the entire banking system, thus establishing a loss distribution for the entire banking system. The 95% quantile of this distribution represents the amount of loss which is not exceeded in 19 out of 20 cases (95% probability).[36]

Table 5 summarizes the results of selected stress tests and of a simulation without a crisis scenario carried out on the basis of end-2006 data and presents the results in the format in-

[35] *In particular, these include macroeconomic risk factors (e. g. GDP growth) as well as market risk factors (e. g. interest rates, exchange rates and stock market indices).*

[36] *For details on the methodology underlying the SRM see Boss, M., G. Krenn, C. Puhr and M. Summer. 2006. Systemic Risk Monitor: A Model for Systemic Risk Analysis and Stress Testing of Banking Systems. In: OeNB. Financial Stability Report 11. 83–95.*

Table 5

Results of Selected SRM Stress Tests for End-2006

%

	Total risk		Credit risk		Market risk		Contagion risk	
	Mean	95% quantile	Mean	95% quantile	Mean	95% quantile	Mean	95% quantile
Simulation without crisis scenario	−2.1	1.1	−1.9	0.6	−0.3	1.5	0.1	1.6
Doubling of domestic borrowers' default probability	−1.1	2.2	−1.0	1.2	−0.3	1.5	0.2	1.6
Increase in euro area interest rates by 120 basis points	−0.3	2.9	−1.9	0.5	1.5	3.2	0.1	1.6
Appreciation of the euro by 10%	−2.8	0.8	−1.9	0.5	−1.0	1.5	0.1	1.6
Depreciation of the euro by 10%	−1.4	2.2	−1.9	0.5	0.3	2.9	0.1	1.6

Source: OeNB.

Note: Values denote the mean and the 95% quantile of the loss distribution in the relevant risk category relative to eligible capital for the first quarter of 2007. Loss from credit risk was adjusted for provisions related to claims on domestic and foreign nonbanks as well as on foreign banks; loss from contagion risk in the Austrian interbank market – which corresponds to the credit risk vis-à-vis domestic banks – was adjusted for provisions related to claims on domestic banks. Correspondingly, total risk was adjusted for total loss provisions.

troduced in December 2006 (Financial Stability Report 12). While sensitivity stress tests typically calculate the impact of a particular crisis scenario on the capital ratio, the format of presentation used here is supposed to indicate whether losses established with SRM simulations (with or without crisis scenarios) are sufficiently covered by capital, taking into consideration existing risk provisions.

The table displays the mean value and the 95% quantile of the loss distribution related to credit, market and contagion risk in the domestic interbank market for the entire Austrian banking sector over one quarter, as well as the sum of these three risk categories, i.e. total risk relative to eligible capital. Existing risk provisions were deducted from the calculated losses.[37]

The simulation without a crisis scenario yields a mean value of –2.1% for total risk. This means that existing risk provisions at end-2006 (EUR 10.74 billion) surpassed the losses expected to arise in a quarter from credit, market and contagion risk in the interbank market (EUR 9.45 billion) by EUR 1.29 billion, which corresponds to 2.1% of total eligible capital[38]. With regard to credit risk, existing provisions for loans to nonbanks and foreign banks exceeded losses expected to arise from these claims by a value corresponding to 1.9% of eligible capital. The mean value of the loss distribution related to contagion risk in the interbank market, by contrast, is higher than the relevant risk provisions, though just by 0.1% of eligible capital. In the case of market risk, no risk provisions were taken into consideration; thus, the value listed can be interpreted as an expected profit in the amount of 0.3% of capital. In the 95% quantile, the losses arising from all risk categories surpass existing loss provisions; in the simulation without a crisis scenario, however, losses never exceeded loss provisions by more than 2% of eligible capital.

[37] *See notes to table 5.*

[38] *The SRM analyzes unconsolidated capital, as group structures of domestic banks are implicitly taken into account by the model.*

In all stress tests, total expected losses based on the assumed crisis scenarios are lower than allocated risk provisions as at end-2006. Even if one assumes a doubling of domestic borrowers' default probability, the related risk provisions still exceed the mean value of the loss distribution related to credit risk by 1% of capital. An upward shift in the yield curve by 120 basis points produces an expected loss from market risk in the amount of 1.5% of capital. The stress tests for exchange rate risk, as in previous tests, yield an expected loss in the event of a euro depreciation, which, at 0.3% of eligible capital, is low. All in all, the capital ratio of the Austrian banking system remained clearly above the regulatory minimum requirement of 8% in all listed scenarios.

Currently, the model framework of the SRM does not allow the stress testing of two risk categories which are significant for the Austrian banking sector, i.e. indirect credit risk of foreign currency loans and credit risk arising from claims in Central and Eastern European countries. Due to this, the year-end 2006 data were subjected to sensitivity stress tests, which are described in greater detail in previous issues of the Financial Stability Report. The sensitivity stress test for indirect credit risk of foreign currency loans yields a reduction of the capital ratio by 0.25 percentage point for the Swiss franc and 0.03 percentage point for the Japanese yen. A new scenario for analyzing credit exposure to Central and Eastern Europe, introduced in the previous Financial Stability Report, is presented in detail in this issue ("Stress Testing the Exposure of Austrian Banks in Central and Eastern Europe" – see special topics).

Overall, the satisfactory shock resilience of the Austrian banking sector was again confirmed on the basis of the end-2006 data.

Moody's New Assessment Method Changes Austrian Banks' Ratings

The OeNB's financial stability analysis is primarily based on supervisory reporting, which is complemented by market data, e.g. valuation of stock prices and ratings. In addition to long-term deposit ratings we particularly focus on Moody's bank financial strength ratings (BFSR) in the following.

Following turbulent changes in the ratings of two major Austrian banks in the first two quarters of 2006, the ratings of these two institutions[39] as well as the ratings of the other large Austrian banks remained unchanged until the end of the first quarter of 2007. The review process of Hypo Alpe Adria's BFSR has since been completed, confirming the rating of D–. At the same time, the review of BAWAG P.S.K.'s ratings was reopened by Moody's after the sale to the consortium led by th U.S. investment fund Cerberus.

At the beginning of the second quarter of 2007, however, there were two major changes in ratings: First, the phasing-out period for state guarantees for state mortgage banks agreed between Austria and the EU expired on April 1, 2007. As a conse-

[39] *As reported in Financial Stability Report 12, between January and May 2006, Moody's gradually downgraded BAWAG P.S.K.'s BFS rating from C+ to E+. The long-term deposit rating was downgraded from A2 to A3 in March 2006. The downgrading of Hypo-Alpe-Adria Bank's BFS rating was also reported.*

Table 6

Ratings of Selected Austrian Banks

As of May 14, 2007

	Deposit-Rating		BFSR[1]	
	LT[2]	Outlook		Outlook
BA-CA	Aa2 (+3)	stable	C+ (−1)	stable
BAWAG P.S.K.	A3	under review	E+	under review
Erste Bank	Aa3 (+1)	stable	C (−1)	stable
Hypo Alpe-Adria	A2 (−3)	stable	D−	stable
Hypo Tirol	Aa1 (−1)	stable	C	stable
Investkredit	A1 (+1)	stable	C (+1)	stable
Kommunalkredit	Aa2 (+1)	stable	B−	stable
Kontrollbank	Aaa	stable	..	..
ÖVAG	Aa3 (+2)	stable	C	stable
RZB	Aa2 (+2)	stable	C (−1)	stable
RLB OÖ	Aa3 (+1)	stable	C (−2)	stable
Hypo Landesbank Vorarlberg	Aa1 (−1)	stable	C	stable

Source: Moody's.

[1] *Bank Financial Strength Rating.*
[2] *Long-term Deposit Rating.*
Note: Values in brackets denote changes caused by the phasing out of state guarantees and the introduction of JDA by Moody's (see text).

quence, the three affected credit institutions (Hypo Alpe Adria, Hypo Tirol and Vorarlberger Landes- und Hypothekenbank) were assigned "non-guarantee" ratings for long-term liabilities, which led to a downgrading of their ratings (see table 6).

Second, the fact that Moody's adjusted its assessment methods led to changes in ratings. Moody's introduced Joint Default Analysis (JDA), with a view to placing greater emphasis on external support for banks through their own group or the government. When the first JDA ratings were published, the ratings of long-term liabilities improved internationally (not just for Austrian banks), while BFSRs were downgraded slightly (see table 6). Owing to the introduction of JDA, the ratings of Austrian banks' long-term liabilities improved in two-thirds of all cases, while for the other banks no deteriorations were recorded. In the BFSR segment, two upgradings compare with four downgradings. Moody's assessment of Austrian banks' subsidiaries did not change significantly, neither with respect to long-term liabilities nor with regard to the BFSR.[40]

Given the fact that rating changes published by other agencies were not nearly as pronounced as those published by Moody's, it is safe to assume that the latter primarily reflect Moody's new rating methods rather than marked improvement/deterioration of the environment of the Austrian banking system or of individual banks.

Stock Prices of Major Austrian Banks Rise Steadily

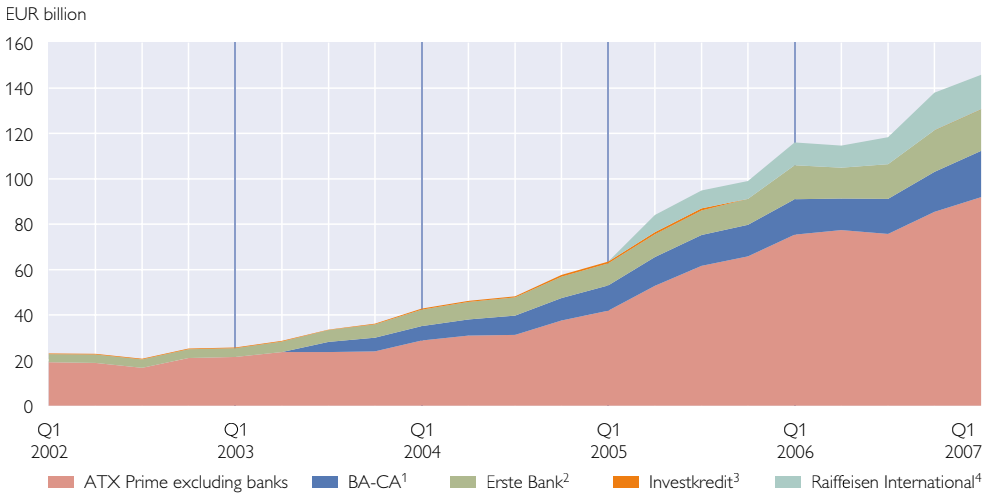
After the market turbulences of early summer 2006, when emerging markets stocks came under pressure worldwide and virtually all stocks listed in the ATX Prime segment declined as a consequence, the Austrian stock market saw three quarters

[40] *See Financial Stability Report 12 of December 2006.*

Chart 24

Market Capitalization of Austrian Banks Listed in ATX Prime

As of March 31, 2007



Source: Wiener Börse AG.

[1] *Relisted on July 9, 2003.*
[2] *Including capital increases on June 12, 2002, and January 27, 2006.*
[3] *Delisted at end-2005 after its takeover by ÖVAG.*
[4] *IPO on the Vienna stock exchange on April 25, 2005.*

marked by positive development and only minor stock market corrections. The market capitalization of the three banks listed in the ATX Prime[41] increased by 26.1% between September 30, 2006, and March 31, 2007, reaching EUR 53.8 billion; year-on-year growth came to 32.6% (see chart 24). Additional momentum was provided by UniCredit's announcement that it planned to repurchase BA-CA's remaining free float of stock at Wiener Börse AG under a squeeze-out. The solid growth of the market capitalization of listed banks was mirrored by overall market developments. Thus, the share of bank stocks in the total market capitalization of the ATX Prime only grew by one percentage point over the past half year, reaching 36.1%.

Following abrupt price changes in May and June 2006, the implicit volatilities of the at-the-money call options[42] of banks listed in the ATX abated in the second half of 2006. So far, the development of implicit volatilities in 2007 has been primarily characterized by the effects of the stock market correction in February, although implicit volatilities have since returned to the level of the second half of 2006. All in all, however, the solid performance of the ATX and of the bank stocks listed in the ATX has shown to imply a higher implicit volatility against, for instance, the Dow Jones EURO STOXX 50 or the Dow Jones EURO STOXX Financial Services Index.

[41] *BA-CA, Erste Bank and Raiffeisen International.*
[42] *Source: Datastream, Bloomberg.*

Less Dynamic Growth of Insurance Companies' and Mutual Funds' Business

Favorable Economic Environment Supports Insurance Sector

Austrian Insurance Companies Record Subdued Premium Growth

Favorable developments in the real economy and in financial markets – combined with the absence of major claims events – had a positive impact on the financial situation of both primary insurers and reinsurers in Europe. The continued uptrend in international stock markets yielded higher investment results. According to preliminary estimates, the solvency of the European insurance sector may have improved slightly. Given the improvement of risk management systems, risk-adequate pricing and stable economic framework conditions, the overall outlook for European insurance companies remains positive.

Austrian insurance companies' business developed less dynamically in 2006 than in previous years, with insurance premium income across all business lines growing by 1.9% (against 9.6% in 2005).[43] This significantly slower expansion is basically attributable to low premium growth (only 0.8%) in the life insurance sector. The decrease in one-off payments in this segment was compensated only by a 36% rise in state-subsidized personal pension plans (to EUR 619 million). Despite sluggish growth, life insurance remained the most important business line, accounting for slightly over 46% of total premiums written in the insurance sector. The share of nonlife insurance and health insurance in total premiums went up slightly to 44.7% and 9.2%, respectively, which is attributable to the relatively strong growth by 2.8% in each of the two categories in 2006. Overall claim payments by insurance companies climbed by 10.4% in 2006; maturing life insurance policies accounted for 60% of this increase, while the remaining 40% were attributable to payments for snow damage. The Austrian Association of Insurance Companies expects the volume of insurance premiums to augment by 3.9% in 2007. In the first quarter of 2007, storm-induced insured damage came to EUR 200 million – a figure that will have an impact on Austrian insurance companies' claim payments throughout the current year.

The market indicators for Austrian insurers have shown a slightly positive development. At the end of the first quarter of 2007, the rating outlook for the large Austrian insurers was stable. The stock prices of insurance companies listed on the prime market segment of Wiener Börse AG remained largely unchanged between December 2006 and May 2007. Compared with the MSCI Europe Insurance Index, stock price developments were below average in the period under review. During the stock market correction of end-February 2007, some Austrian insurance company stocks recorded substantial losses – a phenomenon that was in line with developments in CEE markets.

Aside from shocks in the financial markets and the higher frequency of major claims events, continued lower

[43] *Source: Austrian Association of Insurance Companies, March 2007.*

long-term interest rates and inadequate risk pricing in the face of tough competition also pose risks to the profitability and stability of the insurance sector.

Risk of Contagion Remains Low

In 2006, total assets[44] of Austrian insurance companies went up by EUR 5.8 billion to EUR 82.5 billion. At 7.5%, the annual growth rate was clearly lower for 2006 than for the two previous years, but still slightly above the average rate observed over the past five years (7.4%). The increase in assets can be attributed to a large extent to domestic equity securities and other domestic securities (+EUR 2.4 billion or +11.1%), foreign debt securities (+EUR 2.1 billion or +11.7%) and domestic debt securities (+EUR 0.9 billion or +10.0%). The trend toward increased investment abroad continued, causing the share of external assets in total assets to climb to 34.8%. At end-2006, debt securities accounted for 37.8% of invested assets, while domestic and foreign equity securities and other securities as well as domestic participations had a 40.1% share.

The total exposure of insurance companies to domestic banks went up by 6.1% to EUR 11.2 billion (13.6% of total assets) in 2006, with debt securities issued by domestic banks accounting for the lion's share (EUR 8.4 billion). This item went up by 10.1%. Lending to domestic banks expanded further, going up by EUR 0.1 billion to EUR 0.5 billion in 2006. The share of insurance companies' investments with domestic credit institutions in Austrian banks' consolidated total assets remained unchanged at slightly above 1.2%. Owing to a positive business and profit performance and the moderate level of exposure, the risk of contagion between the banking and insurance sectors is still low.

Mutual Funds Exhibit Slower Growth

While the European mutual funds market continued to benefit from the generally favorable financial market conditions, it expanded at a less dynamic pace than in 2005 (+22.9%) with assets under management[45] going up by 15.0% to EUR 7,574 billion in 2006. Part of this development can be traced to the strong decline in some stock prices in May and June 2006. As a consequence, investors in equity funds exhibited a lower risk appetite, which caused partly high capital outflows in this segment in the second quarter of 2006. The subsequent recovery in the second half of 2006 helped improve investors' confidence, raising the contribution of net capital inflows to 8 percentage points. It was thus even slightly higher than the contribution of price gains at 7 percentage points. While all fund categories recorded net inflows, fixed income and money market funds saw net outflows in the fourth quarter of 2006.

[44] *Excluding reinsurance business; based on quarterly reports (OeNB insurance statistics).*

[45] *Here, mutual funds comprise undertakings for collective investment in transferable securities (UCITS) and non-UCITS. Source: The European Funds and Asset Management Association (EFAMA).*

New Investment in Austrian Mutual Funds Remains Subdued

The capital invested in Austrian mutual funds (excluding investments in funds of funds) advanced by 5.9% to EUR 140.8 billion (net) in 2006 – a clearly weaker pace than recorded in the year before or across Europe. Around 90% of this capital increase was attributable to price gains. Net inflows decreased by two-thirds year on year and reached EUR 4.5 billion, and price gains declined by one-half, coming to EUR 7.1 billion. Distributions climbed by almost 11% to EUR 3.8 billion in 2006. The third and fourth quarters of 2006 even saw net outflows. Weaker growth may be attributable to general market conditions on the one hand and to the increasing importance of structured products which might be seen as competing with mutual funds, on the other. At 4.4%, the capital-weighted average total performance of all Austrian mutual funds was significantly lower in 2006 than in the previous year (10.1%). Mutual funds' performance was characterized, to a substantial degree, by the merely marginal price gains in fixed income funds (+0.9%), which operated in an environment of rising interest rates and a weaker exchange rate of the U.S. dollar against the euro. Equity funds, alternative funds and balanced funds saw an above-average performance, augmenting by 12.8%, 9.8% and 5.0%, respectively. Fixed income, real estate and money market funds, by contrast, only recorded a below-average performance in 2006.

Share of Austrian Stocks in Capital Invested Reaches Record High

A breakdown of retail funds by individual categories shows that while fixed income funds continued to play a dominant role (52.6%), their importance has decreased somewhat since 2003. By contrast, the share of equity funds in the volume of retail funds grew from around 16% to 20.5%, partly on the back of price gains. The holdings of domestic stocks and equities continued to grow (not least owing to their performance at Wiener Börse AG) and accounted for a share of 2.8% in the overall capital invested in mutual funds in 2006, thus reaching its highest level since the introduction of the OeNB's mutual fund statistics in 1998. As the second most important category of funds, balanced funds accounted for 20.9% of capital invested in retail funds, while the remaining categories (money market funds, alternative funds and real estate funds) accounted for just below 6% of capital invested in retail funds.

Low Returns on Severance Funds

In Austria, nine severance funds were licensed to manage severance claims in the fourth quarter of 2006. Their total assets came to EUR 1.2 billion, up 59.6% against the comparable period of 2005 (fourth quarter). In 2006, vested rights to future severance payments climbed from EUR 696 million to EUR 1.1 billion (+61.8%). Eligible capital, by comparison, went up by 2.6% from EUR 21.76 million to EUR 22.3 million and thus exceeds capital requirements calculated at EUR 3.7 million. The capital invested in severance funds is mainly managed by capital management companies. EUR 781 million (i.e. 69.4% of investment groups' assets or 93.9% of indirect investment) were invested in euro-denominated mutual fund shares. At end-2006, the number of employers that had signed severance fund agreements came to 345,914,[46] up by 21.6% from the previous year (284,531 agreements). As measured by the number of agreements with employers, the three largest providers control a market share of 75.2%, thus securing a high market concentration also in 2006 (2004: 74.5%; 2005: 75%). In 2006, severance fund agreements established around 4.5 million vesting periods for 2.1 million people. This corresponds to a rise by 37.7% and 20.7%, respectively, against 2005. The number of vesting periods not assigned to any severance fund went down from 115,134 in 2005 (2004: 215,728) to 54,508 for 51,574 persons. Severance funds' real investment yields came to 2.1% in 2006 (3.5% in nominal terms), after having stood at 2.5% in real terms (nominal: 4.6%) in 2004 and 3.2% (nominal: 5.5%) in 2005.[47] Taking into account the costs of capital management, real investment yields came to around 1.4% in 2006. To sum this up, yields clearly fell below the legislator's expectations of an average of around 6% in the long-run (in nominal terms and adjusted for all costs).[48] Upon termination of an employment contract (with the exception of the cases laid down under Article 14 paragraph 2 Federal Act on Corporate Staff Provision) the prospective beneficiaries may opt for a lump-sum payment of their severance claims, for further investment of the respective assets in the severance fund of their former employer or for a rollover of the assets into their new employer's severance fund. In view of current yields and possible spending needs, up to now around half of prospective beneficiaries have decided against further investment in severance funds, which means that in 2006 severance funds had to make payments of more than EUR 23 million.[49]

[46] *Source: Main Association of Austrian Social Security Institutions.*

[47] *Source: Severance funds platform; OeNB.*

[48] *Source: Vienna Economic Chamber. 2006. www.wkw.at/docextern/ArbeitundSoziales/Extern/Arbeitsrecht/AbfertigungNeu/AbfertigungskassenKostenvergleich.doc and Federal Law Gazette 100/2002.*

[49] *Source: Severance funds platform.*

Special Topics

Banking Efficiency and Foreign Ownership in Transition: Is There Evidence of a Cream-Skimming Effect?[1]

Jaroslav Borovička[2]

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.

JEL classification: C30, G21, G32
Keywords: banking efficiency, stochastic efficiency frontier, foreign ownership, cream-skimming effect.

1 Introduction

The efficiency of banking institutions is an important factor that fosters the economic development in transition economies (Bonin and Wachtel, 2003). A more efficient banking system facilitates financial intermediation and contributes to the optimal allocation of financial resources in the real sector. In transition economies the banking sector plays an even more important role in the process of reallocating financial resources than in developed countries, since other elements of the financial sector are still underdeveloped in those transition countries (Anderson and Kegels, 1998).

In this paper we focus on foreign ownership as an important determinant of banking efficiency in transition economies. Theoretically predicting the direction of the impact of bank ownership is a complex task (Detragiache et al., 2006). On the one hand, foreign banks benefit from the advantages of having access to more advanced information technologies and better expertise in the field than their domestic counterparts. They import more effective supervision and regulation practices and

[1] *This paper is the short version of a longer study that will be published in the CERGE-EI Working Papers series. CERGE-EI is a joint workplace of the Center for Economic Research and Graduate Education, Charles University (CERGE) and the Economics Institute of the Academy of Sciences of the Czech Republic (EI).*

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Refereed by Markus S. Schwaiger, OeNB.

enhance competition. In addition, they may be less vulnerable to political pressures and less inclined to lend funds to connected parties. These factors imply that there is a positive connection between the presence of foreign banks and financial sector performance.

On the other hand, domestic banks have a better idea of how the domestic economies work; they understand the particularities of the respective legal systems, the relevant traditions and other institutional aspects. They are more inclined to lend to informationally opaque firms, as they can monitor these firms more easily than their foreign competitors. All these factors mitigate the negative impact of asymmetric information on the performance of domestic banks as compared to their foreign counterparts.

Our study focuses on the cost side of the efficiency analysis. The prevailing view in the empirical literature on banking in transition countries suggests that banks acquired by strategic foreign partners tend to do better in terms of cost. Only few studies provide empirical evidence suggesting that foreign ownership may, in fact, have a negative impact on efficiency, but these studies are either based on cross-country data from developed countries (Berger et al., 1999), or on data from a set of developing economies including only a small number of transition countries (Detragiache et al., 2006; Lensink et al., 2006) or on individual country data (Kraft and Tirtiroglu, 1998; Matousek and Taci, 2002).

From the econometric point of view, the possibility of an endogeneity bias caused by the so-called cream-skimming effect is a challenge when evaluating the impact of foreign ownership on efficiency. Cream-skimming describes a situation when foreign investors select the most efficient banks for acquisition, thus rendering the sample from which the individual observations are drawn non-random. The presence of the cream-skimming effect suggests that foreign ownership does not necessarily improve the performance of banks, but that the illusionary positive impact results from the fact that the banks acquired by foreign investors had already been the more efficient ones in the first place.

Surprisingly, the cream-skimming effect has not been given appropriate attention in the empirical literature on banking efficiency in the transition economies.[3] This paper tries to take up the challenge and shed some light on the true effect of foreign ownership on banking efficiency by employing a two-step instrumental variable approach. The results of our study can be used by policymakers for developing liberalization strategies and opening domestic banking systems to foreign entry.

[3] *The only paper we are aware of that suggests the possibility of cream-skimming in transition banking is Lanine and Vennet (2005), but this paper rather focuses on microeconomic determinants of foreign acquisitions without integrating the issue into the cost efficiency framework. Hanousek et al. (2007) analyze the relation between the endogeneity of ownership and performance for a large sample of firms in the Czech Republic and find a positive effect of foreign ownership if the subsidiary is owned by a foreign industrial firm. However, they do not focus on the banking sector, as banks account for no more than approximately 1% of the observations in their sample.*

2 Literature and Methodology Review

So far only relatively few studies have addressed the issue of banking efficiency in transition economies, and – to our knowledge – none of these studies has directly examined the extent to which the cream-skimming effect matters. Several approaches to the efficiency estimation are available, including parametric and non-parametric methods (an extensive survey of the literature can be found in Berger and Humphrey, 1997). The basic idea underlying all these methods is to compare the total costs, profits or production plans of the economic units with the best achieved levels observed in the sample.

Given that in transition economies the quality of banking data is not perfect and measurement errors are quite widespread, some authors argue that parametric methods, which are more robust to data problems, would constitute more suitable empirical tools for analyzing banking efficiency (see Fries and Taci, 2005). In this paper we apply the stochastic frontier approach, a parametric method assuming a particular functional form of the estimated cost function or production technology and allowing for an error term composed of a symmetrically distributed random error and a truncated inefficiency term. Kumbhakar and Lovell (2000) provide a detailed discussion of this method.

The data used in this study are based on the BankScope database provided by Bureau van Dijk and they allow us to perform a cross-country analysis. Over recent years BankScope has been the main source of bank-level indicators for several panel data studies[4] of transition countries. The present study picks up the threads of this literature and provides new insights and results which previously were either impossible to obtain owing to lack of data or which remained unconsidered.

Although some of the panel data studies also deal with profit efficiency in the banking sector, we focus solely on cost efficiency – an approach that does of course not provide direct information about the banks' ability to generate profit. Nevertheless, we decided to exclude profit efficiency from this study as the informative value of the available data gave cause for concern. The 1990s in particular – from which a substantial fraction of the data sample is taken – were characterized by underdeveloped administrative and regulatory systems in the transition economies, which created loopholes for profit misreporting linked to rent extraction, the concealing of nonperforming loans or the privatization process. Thus, we feel that reported profits do not provide a reliable picture of the true state of the individual banks during the period analyzed. Although such strategies certainly also have an influence on cost analysis, the impact on bank costs is substantially lower, since profit control only operates on the margin of total costs.

2.1 Foreign Ownership

There is an overall consensus in the empirical literature that banks' cost efficiency is positively associated with foreign ownership. Bonin et al.

[4] *For instance Grigorian and Manole (2002), Yildirim and Philippatos (2002), Rossi et al. (2004), Bonin et al. (2005) or Fries and Taci (2005).*

(2005) report that the participation of international investors adds considerably to banks' cost efficiency. The authors also observe that although government-owned banks tend to make fewer loans, collect fewer deposits and have higher noninterest expenditures relative to other ownership, their performance in terms of efficiency is not significantly lower than that of private domestic banks. Yildirim and Philippatos (2002) find that foreign banks are more cost efficient but less profit efficient than domestic private and state-owned banks. Fries and Taci (2005) use a unique banking database compiled by the European Bank for Reconstruction and Development (EBRD) and provide a detailed ownership breakdown into five categories: greenfield foreign-owned banks, greenfield domestic-owned banks, privatized foreign banks, privatized domestic banks and state-owned banks. Estimation results predict that private banks are more cost efficient than state-owned banks. There are, however, differences among private banks: Privatized banks with majority foreign ownership are the most cost efficient, followed by greenfield banks (domestic and foreign), whereas privatized banks with majority domestic ownership are the least efficient.

Although a statistically significant link between foreign ownership and better performance has been detected in most of the relevant studies, the literature does not provide an appropriate policy discussion of this result on the country level. According to the prevailing results the most developed transition economies exhibit the lowest cost efficiency scores, while it is widely acknowledged that these economies have been very successful in attracting foreign direct investment (FDI) into their banking sectors. This conclusion contains elements of controversy, since on the one hand, foreign ownership enhances efficiency, but on the other hand countries recording the highest inflows of foreign investment have failed to establish efficient banking systems. Another interesting observation is that Slovenia managed to build one of the most efficient banking systems in transition, although it is the transition country with the lowest presence of foreign-owned banks. In fact, the majority of Slovenian banks are still state-owned, which apparently does not preclude the banking system from being relatively efficient.

In a recent study on banking efficiency in a set of transition economies (including some European transition countries) Lensink et al. (2006) examine whether efficiency differences associated with foreign versus domestic ownership depend on the governance of the host country. According to their findings an increase in foreign ownership is negatively linked to banking efficiency. However, the extent of the negative impact varies depending on the state of institutional development and the rule of law, with cost efficiency-reducing effects being less substantial in countries with better established governance practices. The authors interpret this result as evidence that foreign banks find it more difficult to deal with local banking supervision, the respective judicial system and corruption.

From the above discussion it follows that empirical evidence on the relationship between foreign ownership and banking efficiency is mixed. Most of the relevant papers conclude that foreign ownership benefits outweigh the possible disadvantages and

asymmetric information problems. Therefore, opening the domestic banking sector to foreign entry is a standard policy recommendation given in these papers. However, none of the studies try to explicitly address the cream-skimming effect or to investigate whether foreign acquisitions enhance the cost efficiency or whether foreign investors had acquired the more efficient domestic banks in the first place without adding too much to their efficiency afterward.

In this paper, we challenge the widespread conclusion that foreign-owned banks perform better in terms of cost efficiency than their domestic-owned counterparts. We employ a two-step estimation method in the spirit of the Heckman (1979) procedure. In this setup, the acquisition decision is estimated in the first step; then this estimate is used to control for the selection bias in the second step. The appropriateness of this method is based upon the availability of data on instrumental variables that influence the foreign investor's decision to acquire a bank without being correlated with cost efficiency. This method has been widely used for studies on ownership and total factor productivity in many countries, including transition economies (Djankov and Hoekman, 2000). We are not aware of any study that applies a two-step instrumental variable method to analyze the relationship between foreign ownership and efficiency in the banking sector of transition countries.

2.2 The Impact of EU Entry and Country-Specific Factors

The time and cross-sectional coverage of the above-mentioned panel data studies differs significantly. The time span covered varies from three to eight years and involves samples from 1993 to 2002. It is noticeable that none of the studies employ more recent data that cover the period of EU membership negotiations and EU accession. Grigorian and Manole (2002) provide the most extensive cross-section (585 banks in 17 countries) but use a short time period (1995–1998).

Our dataset allows us to construct an unbalanced panel that spans the period from 1995 to 2004 and includes 19 countries.[5] Given the length of the time span covered, we are able to reliably investigate the evolution of cost efficiency over time. Moreover, since the data date back to 2004, we can analyze the effect of EU accession on the eight countries that joined in 2004 as well as the impact of the convergence process on those countries that had filed their EU membership applications but had not been accepted by 2004.

In addition to the indirect impacts of improving institutional factors and economic conditions, which are captured by other country-specific covariates, we hypothesize that EU accession may have a positive impact on production opportunities in the acceding countries. Since EU accession is a gradual process, we do not model it as a simple binary variable. For

[5] *Albania (AL), Armenia (AM), Azerbaijan (AZ), Bulgaria (BG), Belarus (BY), Croatia (HR), the Czech Republic (CZ), Estonia (EE), Georgia (GE), Hungary (HU), Kazakhstan (KZ), Latvia (LV), Lithuania (LT), Moldova (MD), Poland (PL), Romania (RO), Slovakia (SK), Slovenia (SI) and Ukraine (UA).*

countries which have submitted the application for EU membership, the variable equals zero for years prior to submission, then it gradually grows to one for the year of (actual or expected) accession, and finally it equals one for the years following accession. For countries that had filed their applications but did not actually join in 2004, we use the expected year of EU entry. For countries which have not submitted their applications, we set the value to zero for the entire time period under observation. In this way, we are able to capture the increasing benefits resulting from the reforms carried out by countries during the convergence process.

Furthermore, we focus on the impact of various country-specific factors on banking efficiency. In general, the existing studies provide mixed evidence. Grigorian and Manole (2002) and Yildirim and Philippatos (2002) report a positive association between GDP growth and banking sector efficiency, while Fries and Taci (2005) fail to find any significant link. In the same spirit, market concentration was found to have a positive impact on banking efficiency in Grigorian and Manole (2002) – a fact which, according to the authors, has to do with additional benefits from economies of scale. Fries and Taci (2005), by contrast, did not find any significant association between market concentration and cost efficiency, while Yildirim and Philippatos (2002) report a negative link between cost efficiency and market concentration (market competition improves efficiency).

Fries and Taci (2005) also find that lower nominal interest rates in the economy, a greater market share of foreign-owned banks and a higher intermediation ratio are positively correlated with cost efficiency, which implies that greater macroeconomic stability and free access to the banking industry for foreign competitors promote the efficiency of banking systems.

In general, banking inefficiency in transition economies was found to show a decreasing tendency over time (Rossi et al., 2004). Also, progress in banking reforms has a nonlinear association with cost efficiency: The impact of reforms appears to have a positive impact on cost efficiency at the outset while it declines over time (Fries and Taci, 2005).

2.3 The Stochastic Efficiency Frontier Model

In order to evaluate the extent and significance of the sample selection problem we pursue the following empirical strategy. We start by specifying a translog cost function, which is broadly consistent with the stochastic efficiency frontier specification employed in the previous panel data studies. The estimation results from this non-instrumented specification are then compared to our two-stage instrumental variable outcomes. Finally, we present and provide a comparative analysis of inefficiency score estimates for both specifications.

Cost efficiency measures the relative performance of a bank by comparing its current level of costs to the efficiency frontier for a given technology. Since technologically feasible cost frontiers are not observable, the measurement of cost efficiency is based on deviations from minimal costs observed in a sample for practical applications (Aigner et al., 1977).

Following the approach pursued in other related papers, we apply a semilogarithmic second-order expansion of the general form of the cost

function to obtain the well-known translog specification[6] enriched by country-specific factors. In our case, the cost frontier depends explicitly on time. To reduce the number of second-order terms in the regression equation, we assume a linear dependence between total costs and country-specific factors. Thus, the country-specific variables operate as linear cost frontier modifiers and reflect changing operating conditions within which banks optimize their operations; these variables include per capita GDP, the interbank rate, the Index of Economic Freedom provided by the Heritage Foundation and the Index of banking sector reform provided by the EBRD. We prefer this approach to using country dummy variables, since the latter do not explain the sources of differences between countries but merely establish their presence.

In our study banks are modeled as firms producing two outputs (loans Y_1 and deposits Y_2) using two inputs (physical capital and labor, with prices X_1 and X_2, respectively).[7] Loans are measured as the total amount of loans granted by a bank and deposits as the total amount of deposits attracted. The price of physical capital is defined as the ratio of noninterest expenses to total assets, while the price of labor is measured as the ratio of total expenses on personnel over total assets. Other related studies have employed variations of this specification to analyze different aspects of banking efficiency in transition countries.[8]

Furthermore, we are interested in finding out what factors influence the inefficiency term. While country-specific factors constitute the given economic environment for banks and thus cannot be at the source of individual banks' inefficiency, inefficiency itself may depend on bank-specific correlates Z_1– Z_4.

In our model, the net interest margin (Z_1) proxies the degree of competition the bank faces (a larger net interest margin indicates more market power). The ratio of other operating assets to total assets (Z_2) measures the diversification of individual banks' operations. Using this quantity also helps to at least partly account for possibly different output vectors in the relatively heterogeneous sample of banks.

The ratio of net loans to total assets (Z_3) captures the ability to transform deposits into loans. Finally, the ratio of equity to total assets (Z_4) serves as an (inverse) indicator of a bank's leverage and thus controls for the owner's risk preferences and decisions about the capital structure.

The inefficiency term also includes a variable that captures foreign ownership; in this respect we create two competing models.[9] In the benchmark model, foreign ownership is a simple dummy variable, which enters

[6] *The estimated equations are given in the annex. For technical details, see the full version of this paper, which can be obtained from the author upon request.*

[7] *By treating both loans and deposits as outputs, we follow the production approach to banking sector modeling (various versions of this approach measure loans and deposits at their nominal values or as the number of realized transactions). The main alternative is the intermediation approach, which considers deposits as inputs that, together with labor and capital, contribute to the creation of loans on the output side.*

[8] *For example, Fries and Taci (2005) employ a model with two outputs and one input price; Yildirim and Philippatos (2002) and Rossi et al. (2004) assume three outputs and three inputs; Lensink et al. (2006) use two outputs and two input prices.*

[9] *In the full version of this paper, we also specify a third model based on linear instrumenting, which serves as a robustness check.*

the specification as exogenous to the residual efficiency variable. Although this assumption is in line with the existing literature, it does not appear plausible to us for the following reason:

While inefficiency caused by variables observed in financial statements (i.e. included in the bank-specific variables) should be priced and thus be reflected in the price at which a bank is sold to a foreign investor, the residual (in)efficiency is what may attract the foreign investor. The so-called cream-skimming effect documented in other studies on foreign entry predicts that foreign investors tend to acquire the best enterprises in the first place.[10] This means that the decision to purchase shares of a bank in a transition economy might in itself depend on the investor's assessment of the bank's future potential in terms of cost efficiency. This situation leads to an endogeneity problem in the given specification, and estimated coefficients from a non-instrumented specification will be biased and inconsistent.

Therefore, we instrument the ownership dummy in our second model to control for the selection bias. In the first stage of our approach, we estimate a panel probit model linking foreign direct investment (*FDI*) dummy variable to a set of instruments. The predicted values $\widehat{FDI}$ (probabilities of being foreign-owned) then replace the original dummy variable for foreign ownership in the second-stage estimation of the stochastic frontier.

A statistically significant discrepancy in the estimated parameters of the two models indicates an endogeneity bias in the non-instrumented model. The parameter estimates of the non-instrumented model are then inconsistent.

3 Estimation Results

The results of our empirical estimations using the parameterization by Battese and Coelli (1995) are summarized in table 1 and table 2. The cost frontier estimations are performed using the Frontier econometric program developed by Tim Coelli from the University of Queensland (Australia). Accompanying estimations were performed in Stata.

3.1 Cost Frontier Specification

Looking first at the translog time-varying cost function component of the model, we find most coefficients highly significant and relatively similar in all three specifications. This confirms the appropriateness of the time-varying cost function model.

The negative marginal effect of time confirms the overall downward shift in the cost frontier over time, resulting from improvements in the available production technology. These improvements include both hard factors like advanced telecommunications and electronic banking and soft factors like better managerial skills. Consequently, banks are able to cut about 7% of their costs each year, provided they follow the shifts in the cost frontier.

On the country-level, we did not find any significant link between the overall level of economic development measured by per capita GDP and total costs. This finding is consis-

[10] *Lanine and Vennet (2005) present evidence of a common practice by western banks to acquire the best banks in Central and Eastern European countries (CEECs).*

Table 1

Panel Estimation of Stochastic Efficiency Frontier Models

	Instrumented with probit	Without Instruments
Constant	−2.1663***	−2.0512***
log (y_1)	0.058	0.0893
$^1/_2$ (log (y_1))^2	0.1695***	0.1637***
log (y_2)	1.1092***	1.0739***
$^1/_2$ (log (y_2))^2	0.189***	0.1932***
log (x_1/x_2)	0.2039	0.1848
$^1/_2$ (log (x_1/x_2))^2	0.1428***	0.1433***
t	0.109**	0.0973**
$^1/_2$ t^2	−0.0044	−0.0038
log (y_1) log (y_2)	−0.1767***	−0.1752***
log (y_1) log (x_1/x_2)	0.0673***	0.0684***
log (y_2) log (x_1/x_2)	−0.0958***	−0.0964***
t log (y_1)	0.0403***	0.0375***
t log (x_1/x_2)	−0.0143**	−0.0127*
t log (y_2)	−0.0429***	−0.0406***
Country-specific variables (cost frontier modifiers)		
Log per capita GDP	0.0195	0.0039
Interbank rate	0.0048***	0.005***
Index of Economic Freedom	−0.0069	0.0041
Index of banking sector reform	0.0917***	0.1149***
EU accession trend	−0.1018***	−0.0543*
Bank-specific variables (inefficiency correlates)		
Net interest margin	−0.0627***	−0.0696***
Other operating income/total assets	−0.0375***	−0.0388***
Net loans/total assets	−0.033***	−0.0333***
Equity/total assets	0.0049**	0.0053**
FDI[1]	0.2211***	−0.0087

Source: Author's calculations.

*Note: *, ** and *** denote 10%, 5% and 1% significance levels, respectively.*

[1] estimated probability of being foreign-owned in the first column.

y_1 stands for total loans, y_2 for total deposits, x_1 for the ratio of noninterest expenses to total assets, x_2 for the ratio of total expenses on personnel to total assets, t for time.

Table 2

Panel Estimation of Stochastic Efficiency Frontier Models (continued)

	Instrumented with probit	Without instruments
Marginal effects		
log (y_1)	1.3773	1.3489
log (y_2)	1.4443	1.4727
log (x_1/x_2)	1.5713	1.5705
t	−0.0721	−0.0673
Number of observations	1780	1780
Number of banks	282	282

Source: Author's calculations

Note: Marginal effects evaluated at variable means. For the definition of y_1, y_2, x_1, x_2 and t, see note to table 1.

tent with results of Fries and Taci (2005) and Lensink et al. (2006). Equally in line with Fries and Taci (2005), we find that the level of nominal interest rates has a positive and significant impact on scaled total costs: an increase by 1 percentage point in the interbank rate causes total costs to rise by 0.5%. The estimation results are mixed regarding the impact of liberalization reforms on banking costs. We failed to find any

significant connection between the respective country's ranking in terms of the Index of Economic Freedom and banking costs. The Index of banking sector reform, however, was found to have a positive and significant impact on total costs. Fries and Taci (2005) explain the possibility of a positive association between banking sector reforms and banking costs by the fact that banks in transition are moving from a defensive restructuralization of banking operations (cost cutting) to operating strategies based on service improvement and innovation, which require a higher level of spending.

The significantly negative coefficient of the variable that captures the EU accession trend confirms the positive impact of EU accession on banking sector productivity. Even after controlling for the benefits linked to institutional and economic development and for the evolution of technology over time, we are still able to find that EU entry shifts the available cost frontier downward. We expect that including subsequent years of data into our estimation will further strengthen this effect as the positive impacts of EU accession unfold.

3.2 Inefficiency Analysis

The analysis of the bank-specific inefficiency correlates uncovers a significantly negative association between banking costs and the proxy for a bank's market power measured as the level of its net interest margin (the difference between the implicit rates for lending and borrowing).[11] This result indicates that banks with greater market power are able to reduce their costs, possibly owing to economies of scale and scope. This finding is consistent with the findings in Grigorian and Manole (2002) and differs from those reported by Fries and Taci (2005) and Yildirim and Philippatos (2002), who found nonsignificant and negative associations, respectively.

We proxy the degree of diversification of banking activities by the ratio of other operating income to total assets and find that it is significant and negatively associated with banking costs. This result is in line with previous findings and indicates that larger banks with a greater variety of banking services tend to perform better. Similarly, banks which are more active in terms of loan provision, as captured by the ratio of net loans to total assets, are also significantly more cost efficient, which might be attributable to economies of scale.

Finally, those banks which allocate a greater share of their assets to their capital for stability reasons should sacrifice part of their cost efficiency, as they distract a share of their assets from circulation.

3.3 The Impact of Bank Ownership

Following the general discussion of estimation results, we focus on the effect of foreign ownership. Contrary to the other cross-country panel data studies (e.g. Yildirim and Philippatos, 2002; Fries and Taci, 2005; Bonin et al., 2005; Lensink et al., 2006), we

[11] *We believe the net interest margin is a better proxy for the market power of a particular bank than the share of the largest banks' assets in total banking assets (a popular indicator employed in other related works). The net interest margin provides a qualitative measure of how banks benefit from their market position in terms of price setting, while the market share measure may be distorted by specific characteristics of banking sector regulation in a particular country.*

do not find a significantly positive relation between foreign ownership and cost efficiency in our non-instrumented model (see the specification without instrumental variables in table 1).

To check for the presence of the cream-skimming effect, we start by running a panel random effect probit model, which we apply to instrument for the decision of foreign investors to acquire domestic banks. In the probit specification, we use the exogenous variables from our model and add instruments which we assume to correlate with the decision of foreign investors to buy a bank, but which are independent of the residual inefficiency after accounting for all exogenous variables. These instruments include information about individual banks (total expenditure, total assets, total fixed assets and net interest revenue as size indicators; cost-to-income ratio, recurring earning power and noninterest expenses-to-total assets as performance indicators) and country-specific information about the size of the country in question, the size of its banking sector and the involvement of other foreign investors (i.e. data on the population, number of banks and number of foreign banks, respectively).

After instrumenting for the foreign ownership dummy, we find a substantial change in the impact of foreign ownership on the cost efficiency (see first column in table 1). The impact of foreign ownership becomes significantly positive, which implies that there is a negative relationship between the foreign ownership of a domestic bank and its cost efficiency. This leads us to the conclusion that foreign investors do not improve cost efficiency, but rather contribute to its deterioration. The insignificant coefficient in the specification without instrumental variables is caused by two effects working in opposite directions: The less favorable performance in terms of cost efficiency is partly offset by the fact that foreign investors tend to primarily acquire banks with high residual efficiency, which is not captured by our efficiency correlates. The negative impact of foreign ownership on cost efficiency is uncovered in the instrumental variable specification and confirms the cream-skimming hypothesis. Since cream-skimming is related to the residual efficiency not captured by observable quantities, it may be partially caused by insider information the foreign investors have about the acquired domestic banks.

This finding supports the evidence provided by Lanine and Vennet (2005) that "large Western European banks have targeted relatively large and efficient CEEC banks with an established presence in their local retail banking markets". In addition, the empirical finding has its theoretical justification as stated in Detragiache et al. (2006), where the authors show that in a world with imperfect competition and informational asymmetries, foreign entry can cause banking sector efficiency to diminish.

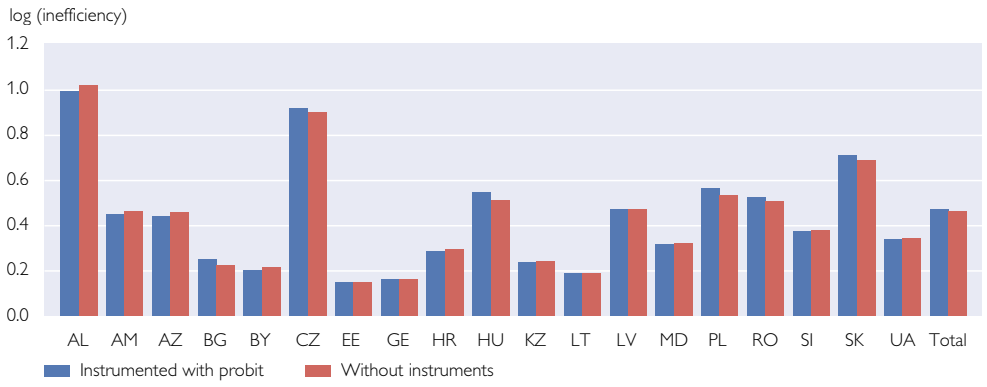
3.4 Inefficiency Scores

Chart 1 presents estimated average inefficiency terms in both models for the set of countries under consideration. Both specifications produce comparable inefficiency scores, and endogeneity does not play a substantial role in this case.

The overall average inefficiency measure indicates that banks are on average operating 47% above the optimal cost frontier. The results vary

Chart 1

Average Inefficiency Scores for Individual Countries



Source: Author's calculations.

Note: AL: Albania, AM: Armenia, AZ: Azerbaijan, BG: Bulgaria, BY: Belarus, CZ: Czech Republic, EE: Estonia, GE: Georgia, HR: Cro atia, HU: Hungary, KZ: Kazakhstan, LT: Lithuania, LV: Latvia, MD: Moldova, PL: Poland, RO: Romania, SI: Slovenia, SK: Slovakia, UA: Ukraine.

heavily across countries. The worst performer is Albania, but otherwise the economically less developed countries do not underperform. The Visegrad countries[12] show above-average inefficiency, with the Czech Republic almost matching Albania. This is not a good record for countries which should be closing the gap to the "old" EU members; it is, however, consistent with the findings presented in previous studies. Incidentally, these are the countries that have been very successful in attracting FDI into their banking systems.

On the other end of the spectrum, the Baltic countries generally show a much better performance, with Estonian banks being on average the most efficient ones within the whole sample. Banks in CIS countries exhibit medium inefficiencies, with Georgia being the best-performing country among the CIS countries.

4 Conclusions

In this paper, we address the issue of foreign ownership and banking efficiency in the European transition economies. We employ the instrumental variable approach to tackle the sample selection problems caused by the possibility of cream-skimming. Our main observation is that the instrumental variable approach makes the coefficient of the impact of foreign ownership on banking efficiency positive and highly significant. This finding indicates the presence of a cream-skimming effect, which predicts that foreign investors target the most efficient banks for acquisition in the first place.

Furthermore, our estimations suggest that those transition countries which started EU accession negotiations and eventually became (or will soon become) EU members have experienced a downward shift in the cost frontier. This trend documents that improved discipline resulting from the obligations related to EU accession together with benefits from technological and market spillovers indeed improves banking sector technology in the accession countries.

The comparison of inefficiency scores provides evidence that in general, the most advanced transition

[12] *The Czech Republic, Hungary, Poland and Slovakia.*

countries (the Czech Republic, Hungary, Poland and Slovakia) house the most inefficient banks, with only Albania disrupting this unflattering hegemony. Since these countries have been the most successful in terms of attracting FDI into their banking systems, this result implies that opening the financial sector to foreign entry does not necessarily lead to an improvement in the performance of banking institutions. Drawing parallels to previous findings of a downward shift in the cost frontier owing to EU accession, we interpret this result as the inability of those transition economies that recently joined the EU to accommodate the improved technological possibilities and fully enjoy the gains stemming from productivity improvements.

However, we would like to emphasize that the negative association between foreign ownership and cost efficiency should not be confused with the contribution of foreign ownership to the stability of financial systems in emerging markets. Rather, the results of this paper should be interpreted as evidence of the inefficient use of inputs by foreign-owned banks given the input prices and other country- and bank-specific characteristics. In other words, foreign-owned banks in transition economies might be more active in terms of providing e.g. more loans to local clients or extending banking services within their local networks in transition countries. As mentioned in Detragiache et al. (2006), a possible reason why this is not happening is that foreign-owned banks prefer stability to efficiency and engage in activities with either top-ranking domestic clients or foreign firms and governmental organizations to ensure the safety of their operations.

In addition, we do not want to necessarily associate the negative impact of foreign ownership on cost efficiency with underperformance. After entering a new market, foreign owners may decide to follow strategies aimed at long-term success and development which may be costly in the short-run. These include aggressive expansion in the market or in-depth modernization and restructuring, which usually require additional spending. Furthermore, this paper does not include an analysis of profit efficiency, which means that we cannot tell whether foreign-owned banks might be able to generate comparable or higher profits despite their higher costs.[13] However, this does not change our conclusion about foreign banks primarily targeting more efficient domestic banks, which biases cost efficiency results if not treated properly in the analysis.

The results of our estimations suggest that opening domestic financial systems to foreign entry should not be regarded as panacea for policymakers in transition economies. To enjoy the full benefits of bank acquisition by foreign investors, the countries in question should develop appropriate strategies to diminish the impact of the cream-skimming effect. In addition, the creation of beneficial conditions for foreign entrants can lead to greater benefits only if supported by a set of other institutional reforms, for example the improvement of governance practices.

[13] *Maudos et al. (2002) provide some empirical evidence on the aggregate level in their study of the Spanish banking sector.*

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Annex

The translog specification of the cost function with K inputs and L outputs can be schematically written as

$$\log\frac{TC}{X_1} = \beta_0 + \sum_{k=2}^{K}\beta_k \log\frac{X_k}{X_1} + \sum_{l=1}^{L}\gamma_l \log Y_l + \frac{1}{2}\sum_{k=2}^{K}\sum_{l=2}^{K}\delta_{kl}\log\frac{X_k}{X_1}\log\frac{X_l}{X_1} +$$
$$+\frac{1}{2}\sum_{k=1}^{L}\sum_{l=1}^{L}\psi_{kl}\log Y_k \log Y_l + \sum_{k=2}^{K}\sum_{l=1}^{L}\omega_{kl}\log\frac{X_k}{X_1}\log Y_l + \tau_1 t + \frac{1}{2}\tau_2 t^2 +$$
$$+\sum_{k=2}^{K}\tau_k^X t\log\frac{X_k}{X_1} + \sum_{k=1}^{K}\tau_l^Y t\log Y_l + \sum_{n=1}^{N}\xi_n G_n + v + u$$

where TC are total cost, X_k input prices, Y_l output quantities, t denotes time and G_n country specific variables. Dividing by the price X_l imposes homogeneity of the cost function in prices; we also require symmetry in second partial derivatives $\delta_{kl}=\delta_{lk}$ and $\psi_{kl}=\psi_{lk}$. Furthermore, v is a zero-mean random error and u the inefficiency term specified as

$$u = \lambda_0 + \sum_{m=1}^{M}\lambda_m Z_m + \alpha FDI + \varepsilon$$

where Z_m are the bank-specific inefficiency covariates, FDI is a dummy for the bank being foreign owned and ε denotes the residual inefficiency. We instrument FDI by OLS and by the panel probit model

$$\Pr(FDI = 1 \mid I_1,\ldots I_R) = \Phi\left(\sum_{r=1}^{R}\theta_r I_r\right)$$

and use the estimated probabilities $\widehat{FDI}$ in the inefficiency term specification. The instruments I_r include both country-specific and bank-specific variables.

The Concept of Capital within the Framework of Basel II

Georg von Pföstl

The new Basel II Capital Accord has been one of the financial sector's most fiercely discussed topics in the recent past. After many years' debate, the regulations formally took effect on January 1, 2007, and the advanced measurement approaches are scheduled to become fully operational on January 1, 2008. The new regulations will cause a number of changes in the area of credit risk. The calculation of risk-weighted assets, and thus of regulatory capital, will henceforth be based on borrowers' credit ratings to a much greater extent than according to the old regulations (Basel I). The concept of capital (i.e. the definition of own funds) itself will remain largely unchanged, although it was subject to repeated changes in recent decades. This paper examines the definition of capital in the new Austrian Banking Act and shows that the capital concept will need to be modified in the future. In addition, it defines regulatory capital in relation to other capital concepts, revealing inter alia that capital has a broader definition than balance sheet equity. An analysis of the capital adequacy of Austrian credit institutions demonstrates that their capital ratio clearly exceeds minimum capital requirements and that the composition of banks' capital shows a favorably high share of core capital.

JEL classification: G21, G28.
Keywords: Basel II, credit institutions, banking supervision, capital, regulatory capital, own funds, capital ratio.

1 Introduction

Following a consultation phase that lasted several years, the new capital adequacy framework (Basel II) formally took effect in early 2007. (By exercising a national discretion, credit institutions in Austria may, however, defer the application of the new regulations to 2008.) The advanced approaches (advanced IRB approach and AMAs) become fully operational in 2008. Austria transposed the relevant EU directives ("Capital Requirements Directive", CRD, and "Capital Adequacy Directive", CAD) into national law by revising the Austrian Banking Act and publishing the new Solvency and the Disclosure Regulations. In the sphere of credit risk, borrowers' credit ratings will play a bigger role in establishing capital requirements under the new rules than they used to under the Basel I framework. While this means that the calculation of risk-weighted assets – and thus capital ("own funds"[1] in the CRD) – will be subject to major changes compared with Basel I, the definition of capital will remain largely unchanged for the time being. However, there are plans to revise the concept of capital as current national discretions and differing accounting standards are expected to give rise to differences in the eligibility of different types of capital. Given the complexity of the topic, these changes are not envisaged until after Basel II has become fully operational.

This paper examines the impact of the new capital regulations on the definition of capital. A historical outline illustrating the development of the concept of (liable) capital is provided before we examine the definition provided in the (new) Austrian Banking Act and show what (minor) adjustments have been made to the Austrian Banking Act in the course of

Refereed by:
Markus S. Schwaiger, OeNB

[1] *The terms "capital" and "own funds" are used inconsistently in the various legal documents this paper refers to; for reasons of consistency, we use "capital" throughout the paper.*

its amendment. Furthermore, regulatory capital is defined in relation to other concepts of capital, and the capital adequacy of Austrian credit institutions and its historical development are analyzed. Finally, we provide an outlook on changes to capital requirements that can be expected from Basel II. Macroeconomic aspects of Basel II such as procyclicity are not considered in this article.[2]

2 The Concept of Capital within the Framework of Basel II

2.1 Historical Development of the Capital Concept

Austrian banking legislation as such did not exist until March 1979. Until then, Austrian credit institutions were subject to the (adapted) regulations of the German Banking Act dating from 1939. Before the German Banking Act was introduced, individual regulations and special statutes governed the Austrian banking sector. [3]

The concept of "liable capital" is found for the first time in the above-mentioned German Banking Act of 1939, although similar provisions had existed previously, e.g. in the Mortgage Banking Act (restriction of credit bond issuance in relation to share capital). The German Banking Act defined for the first time what, in regulatory terms, may be recognized as capital in an initial attempt to set structural norms. These structural norms comprised a maturity matching rule, a liquidity rule and a type of large exposures rule.

Passed in 1979, the first Austrian Banking Act (Kreditwesengesetz) was to a very large extent based on its German equivalent, with capital corresponding to liable capital plus loosely defined general allowances for losses. The maturity matching rule stipulated that capital must amount to at least 4% of liabilities that are not covered by liquid funds. The liquidity rule stipulated that the balance sheet value of equity investments, real estate and buildings may not exceed 100% of capital. A type of large exposures rule stipulated that the exposure to a single client may only amount to between 5% and 7.5% of liabilities. These three rules constituted the structural norms. The calculation of capital requirements was based exclusively on the liability side of the balance sheet, which meant that capital adequacy in Austria was lower than in other countries. This situation – highlighted by an OECD study, according to which the equity ratio of Austrian banks fell from approximately 6% to below 2.5% from 1960 to 1983 – called for a change.

The Act amending the first German Banking Act (1986) represented a fundamental intervention in the law existing at the time and basically tightened up the provisions relating to capital by introducing the concept of participation and supplementary capital (while reducing the eligibility of so-called surrogate capital). In addition, rules governing the coverage of banking risks – large exposures, liquidity, open foreign exchange positions, investment limits – were also

[2] *The data (on an unconsolidated basis) used in this paper are provided by the OeNB as compiled from banks' monthly balance sheet reports.*

[3] *See Turner (2000) for details on the information provided in this paragraph and the following ones regarding the historical development of capital and the capital concept.*

tightened up or added. This amendment had two aims: first, to reflect the international trend in limiting ever more complex banking risks with more stringent capital provisions and, second, to encourage credit institutions to build up more capital. In this connection, the 1986 amendment introduces the term "liable capital." The asset side of the balance sheet now represented the basis for calculating liable capital, with 4.5% of asset items having to be held in liable capital at all times. Moreover, off balance sheet transactions (contingent liabilities) were now also included in the capital requirements (2.25%).

In 1994 the second Austrian Banking Act (Bankwesengesetz – BWG) entered into force as a new legislative framework for banks, introducing the concept of "eligible own funds." The new regulations differed from the old framework both in terms of composition and eligibility by imposing a 1:1 ratio of core capital[4] to supplementary capital[5]. Among other things, eligible capital had to attain a solvency ratio of 8% of both risk-weighted assets (based on counterparty risk) and off balance sheet transactions. This solvency ratio also had to be used on a consolidated basis.

The Banking Act was subsequently amended several times, in particular with a view to implementing the Capital Adequacy Directive in 1996. As a result, the definition of capital was again changed (to include tier 3 capital[6]), and capital requirements for market risks were introduced, thus abandoning the exclusive focus on credit risks (market risks had not been covered at all previously, apart from restrictions on open foreign exchange positions). In 1998, finally, innovative capital (hybrid capital[7]) instruments were recognized as capital based on consolidated figures. This definition of capital continues to apply by and large and was also retained – with a few modifications – in the (new) Banking Act, which has been in force since January 1, 2007.

2.2 The Definition of Capital under § 23 Austrian Banking Act

The definition of eligible regulatory capital as outlined in the 1998 Capital Accord (Basel I) remains in place, except for some modifications, in the revised capital adequacy framework (Basel II) and in the revised Austrian Banking Act. At present, capital thus includes the original categories of core (tier 1) and supplementary (tier 2) capital plus short-term subordinated

[4] *Core or tier 1 capital is the most reliable form of capital and broadly equivalent to balance sheet equity. Core capital must be fully and immediately available to a credit institution for covering risks and absorbing losses as soon as they arise.*

[5] *Supplementary or tier 2 capital is the second most reliable form of capital and includes items such as hidden reserves. Tier 2 capital is limited to a proportion of tier 1 capital held.*

[6] *Tier 3 capital includes short-term subordinated capital, which is less reliable as a source of liability capital than tier 1 and tier 2 capital. It may only be used to apply capital requirements for market risks and is subject to restrictions on recognition.*

[7] *Although both the concepts of innovative capital instruments and hybrid capital are often used synonymously, they sometimes have different meanings. The concept of hybrid capital describes instruments that possess both equity and debt components. Since 1998 (Sydney press release), the concept of innovative capital instruments (or innovative tier 1 capital) has normally related to the portion of hybrid instruments that are recognized as (core) capital within the framework of Basel II. See CEBS (2006b, p. 2).*

(tier 3) capital, which was introduced in line with the explicit recognition of market risks (1996).[8]

Table 1 presents a summary of the components eligible as capital under § 23 Banking Act, the items to be deducted from capital and the eligibility of various forms of capital.

Although this definition of capital remained essentially unchanged, a few amendments were made to the (new) Banking Act – apart from renumbering articles and paragraphs and the relevant references:

- If expected losses as calculated according to the IRB approach are less than value adjustments and provisions, credit institutions may recognize as capital the difference up to a maximum of 0.6% of risk-weighted assets (§ 23 para 1 No 10).
- Where expected losses exceed value adjustments and provisions, banks must deduct the difference from capital (§ 23 para 13 No 4c).
- Banks must also deduct from capital a securitization exposure subject to a risk weight of 1,250% (§ 23 para 13 No 4d).

The first two points reflect the fact that – unlike the original proposals of the Basel Committee on Banking Supervision (BCBS) – the IRB approach will focus to unexpected loss only. Credit institutions must, however, compare their expected loss amounts with their value adjustments and provisions levels. As explained, they may count a positive net balance toward capital, but must deduct a negative net balance.

2.3 Future Modification of the Capital Concept

There are plans to revise the definition of capital, basically for two reasons. First, the above-mentioned calibration of unexpected loss and thus the new treatment of provisions will generally reduce the ratio of core capital requirements to overall capital requirements. Second, there currently exist national discretions and differing accounting standards, which will give rise to (competition-distorting) differences in the definition and the eligibility of different forms of capital. Growing convergence toward a uniform international capital standard requires a unanimously agreed list of capital instruments that may be used to cover unexpected loss.[9]

Uniform standards for regulatory capital cannot be attained until currently diverging national differences concerning the regulatory recognition of various capital items are eliminated. "Because of national differences in the composition of regulatory capital and loan loss provisioning standards, Basel II may require banks to be subject to widely varying degrees of prudential safety while ostensibly satisfying an identical IRB minimum capital requirement. If a bank's regulatory capital includes a greater share of equity than average and its specific loan loss provisions are more conservative than average –

[8] *The term "core (tier 1) capital" used in the Austrian Banking Act and in the Revised Framework Version published by the Basel Committee on Banking Supervision (BCBS) is equivalent to "original own funds" used in the EU directives; "supplementary (tier 2) capital" is equivalent to "additional own funds." For "short-term subordinated capital" or "tier 3 capital," the EU directives use the term "ancillary own funds."*

[9] *See BCBS (2006, p. 4).*

Table 1

The Definition of Capital Pursuant to §23 Austrian Banking Act

	Capital Components	Eligibility		
Core capital	Paid-up capital pursuant to § 23 para 3	Unrestricted eligibility (§ 23 para 14 No 1)		
	Disclosed reserves including liability reserve pursuant to § 23 para 6;			
	The interim profit in the current business year shall be counted toward the disclosed reserves only if			
	a) it has been calculated in accordance with the principles set out in Chapter XII after deducting all foreseeable taxes, charges and dividends,			
	b) the bank auditor has verified the accuracy of the calculation pursuant to lit a, and			
	c) the credit institution has demonstrated to the FMA the accuracy of the calculation pursuant to lit a;			
	If a credit institution is the originator of a securitization, the net profits from capitalized future income generated by securitized claims that enhance credit quality may not be included.			
Deductions from core capital	Funds for general banking risks pursuant to § 57 paras 3 and 4			
	– The credit institution's portfolio of own equity at book value pursuant to § 23 para 2			
	– Intangible assets pursuant to § 23 para 13 No 1			
	– Net loss as well as substantial negative results in the ongoing business year (§ 23 para 13 No 2)			
Supplementary capital	Hidden reserves pursuant to § 57 para 1	Up to 1.5% of the assessment base, provided core capital amounts to 4.5% of the assessment base (§ 23 para 14 No 4)		Up to 100% of core capital (§ 23 para 14 No 2)
	Supplementary capital pursuant to § 23 para 7 and participation capital (§ 23 paras 4 and 5) with the obligation of subsequent payment of dividends			
	Revaluation reserves pursuant to § 23 para 9			
	A positive net balance of value adjustments and provisions vis-à-vis expected losses of up to 0.6% of the assessment base pursuant to § 22 para 2, provided the expected losses are calculated pursuant to § 22b para 6 No 1 using the IRB approach pursuant to § 22b; securitization exposure that is subject to a risk weight of 1250% must not be included in this item.			
	Subordinated capital pursuant to § 23 para 8	Eligible five years prior to the repayment date in five equal annual installments (§ 23 para 14 No 5)	Up to 50% of core capital (§ 23 para 14 No 3)	
	Liability sum surcharge pursuant to § 23 para 10	Up to 25% of core capital (§ 23 para 14 No 6)		
Short-term subordinated capital	Short-term subordinated capital pursuant to § 23 para 8a	Only to be used for covering market risk. The amount of short-term subordinated capital employed may not exceed 200% of the core capital used for covering market risk (§ 23 para 14 No 7).		
Deductions from capital	– Shares, subordinated claims and other capital components held by the credit institution in other credit institutions and financial institutions of which it holds more than 10% of their capital pursuant to § 23 para 13 No 3	Deduction of 50% from core capital, 50% from supplementary and subordinated capital pursuant to § 23 para 14 No 8 If the amount of deductions exceeds supplementary and short-term subordinated capital, the excess amount must be deducted from core capital. Securitization exposures pursuant to § 23 para 13 No 4d must not be deducted if included in the calculation of risk-weighted assets.		
	– Shares held directly or indirectly, subordinated claims and other capital components held by the credit institution in other credit institutions or financial institutions of which it holds up to 10% of their capital that exceed 10% of the credit institution's capital (§ 23 para 13 No 4)			
	– Shares and capital components in insurance companies, reinsurance companies and insurance holding companies pursuant to § 24 para 13 No 4a			
	– For credit institutions which use the IRB approach pursuant to § 22b the difference between expected losses pursuant to § 22b para 6 and value adjustments and provisions (§ 23 para 13 No 4c)			
	– A securitization exposure which is subject to a risk weight of 1250% (§ 23 para 13 No 4d)			

and to the extent that its national regulations or supervisor encourages these business practices – the bank will satisfy a higher prudential standard than the average bank that meets Basel II IRB standards."[10]

As regards standardizing the definition of capital, specialist literature sometimes points out that it would be grotesque "to stipulate the percentage of minimum regulatory capital with extreme precision but to allow gray areas for the summands of the numerator both at the national level and in internal market competition."[11]

The key importance of a standardized definition of capital is evident not least in a study published in mid-2006 by the *Committee of European Banking Supervisors* (CEBS). This study provides a detailed analysis of the capital components that are cited in Article 57 of the CRD and eligible in the EU Member States. Although the study identifies a number of commonalities between individual countries (there are e.g. criteria such as robustness, cover for losses and flexibility, whose degree of compliance determines both the allocation to various capital component categories and the degree of eligibility), it concludes that the scope provided for in the directive, the differing corporate and accounting regulations and local market characteristics will give rise to varying definitions of capital items.[12] The key findings of the study can be summarized as follows:[13]

- In all EU Member States, (paid-up) capital and reserves constitute the highest quality core capital and are unreservedly recognizable as such from a regulatory perspective.
- On the first-time application of IAS/IFRS, equity is reduced owing to the fact that the Commercial Code and IAS/IFRS valuation provisions currently differ. Although this situation is mitigated by *prudential filters*, an adjustment of core capital cannot be prevented entirely.[14]
- Some countries have accepted as components of core capital new forms of capital (hybrid capital) geared to the relevant national legal and tax conditions although these new forms do not have the same quality as (paid-up) capital and reserves. The volume of hybrid capital – which is subordinated vis-à-vis deposits, other liabilities and subordinated liabilities – has grown significantly in recent years, attaining a volume of some EUR 60 billion in Europe according to a CEBS study conducted between end-2005 and early 2006.[15,16]
- The recognition of hybrid instruments gives rise to different scenarios between Member States. Most countries plan to apply a cap

[10] *See Kupiec (2003, p. 31).*

[11] *See Bruckner and Raab (2004, p. 630).*

[12] *See CEBS (2006a, p. 3–4).*

[13] *For details on the following statements, see CEBS (2006a, p. 4–6). For a clear-cut comparison of the national differences, see appendix of CEBS (2006a).*

[14] *See also CEBS (2006c).*

[15] *See CEBS (2006b, p. 3).*

[16] *On the development of hybrid capital in Europe, see also ECB (2006, p. 108–110).*

of 15% of core capital to hybrid capital with *incentives to redeem*. The recognition limit of overall hybrid items will vary to a greater extent and can amount to up to 50%. In Austria, hybrid capital pursuant to § 24 para 2 No 1 Austrian Banking Act can be counted toward consolidated capital up to a maximum level of 15% of consolidated core capital. Unless otherwise agreed in line with § 24 para 2 No 6e Austrian Banking Act, hybrid capital can be counted toward consolidated capital up to a maximum level of 30% of consolidated core capital.

- The requirements for the eligibility of different supplementary capital items have consistently been implemented in the individual EU Member States.
- Basically, only undated instruments qualify as supplementary capital (apart from subordinated items). In some cases, however, items with a specific maturity are also recognized, typically subject to regulatory approval. Table 1 presents capital items that are eligible as supplementary capital in Austria.
- The biggest differences in respect of subordinated instruments that are eligible as supplementary capital relate to the recognition restrictions applicable in the last five years prior to the repayment date.
- No standardized procedure currently prevails for deducting shares in insurance companies.
- In the area of subordinated capital, Member States recognize short-term subordinated instruments for hedging market risk. Although their respective requirements have generally been implemented consistently, there are some differences regarding the eligibility of various instruments. For instance, net trading book profits of credit institutions are not recognized in Austria in contrast to Germany.

2.4 Definition of Regulatory Capital Compared with Other Capital Concepts

The above remarks make clear that the regulatory definition of capital differs from the one used in the accounting concept of capital. It is defined more broadly and not limited only to (equity) items shown on the balance sheet. The interaction between these two approaches at both the national and international level has an impact on capital adequacy measurements – a situation which the Basel Committee is aware of. The Committee is therefore endeavoring to narrow disproportionate differences between regulatory and accounting standards.[17,18]

In the following, we will briefly explain the terms "balance sheet equity" as well as "economic value" and "market value" of equity, which are used in addition to the term "regulatory capital," and provide a comparison of these concepts with that of regulatory capital:

[17] *See BCBS (2006, p. 3).*

[18] *Differences between regulatory and accounting standards are, however, not only found in the area of equity. For expected loss, for example, both approaches define and interpret the risk parameters (PD, LGD and EAD) required for the calculation of expected loss in differing ways. See, for instance, PWC (2006).*

– Balance sheet equity corresponds to the book value shown on the balance sheet and is composed (in simplified form) of the following items: subscribed capital, capital reserves, profit reserves, liability reserves as well as balance sheet profit or loss.
  The amount of balance sheet equity depends on the accounting rules used by the respective credit institution, as the Commercial Code and IAS/IFRS valuation provisions currently differ. This is why, for instance, the valuation of assets following international standards relies much more strongly on market values (see, for example, the rules governing the valuation of financial instruments pursuant to IAS 39).[19]
  In addition, balance sheet equity provides only an approximate picture of cover pools actually available at a credit institution, which is primarily attributable to the fact that hidden reserves are not included. This situation is only partially mitigated by IAS/IFRS.[20]
– The economic value of equity is obtained by adding balance sheet equity to hidden reserves. In this case the valuation of assets is based on market values (fair value accounting) and includes only transactions that have already been concluded. In the absence of market values, specific valuation methods (e.g. the discounted cash flow method) are used to calculate these values. To calculate the net economic value, all value-reducing factors that may arise when hidden reserves are increased must be deducted (e.g. realization risk). In retail banking, for instance, all discounted costs (operating costs, risk costs, costs of capital) must be deducted from the calculated present value of cash flows in order to obtain the long-term net economic value.[21]
– Unlike the calculation of the economic value of equity, the market value of equity also includes the expected goodwill. Whereas the market value for publicly traded companies corresponds to the shareholder value, for private companies it can be calculated using internal models (e.g. valuing future projected profits using the net present value method). From a risk perspective, the use of this valuation approach, i.e. the use of market values, is problematic insofar as the calculated value of equity in a risk event is hardly available over a sustained period of time.[22]

Chart 1 draws a clear and comprehensive picture of the distinction between the concept of regulatory or supervisory capital on the one hand and the above-mentioned definitions or valuation approaches on the other.

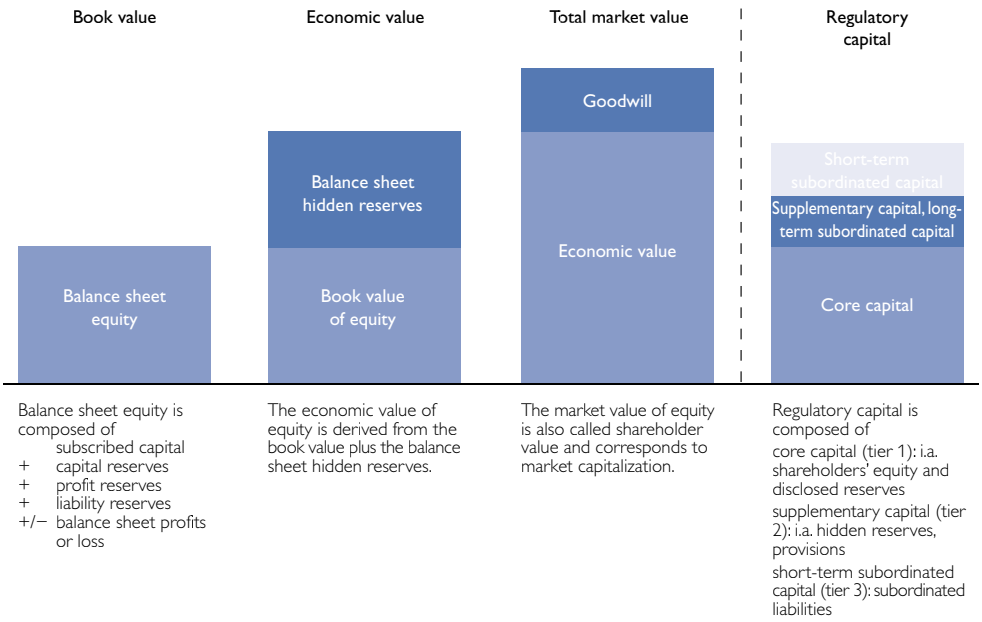
2.5 Regulatory Capital vs. Economic Capital

Another differentiation to be made is that between regulatory capital and economic capital. Economic capital signifies "[…] the overall risk cover-

[19] *For the fundamental differences between the Commercial Code and IAS, see the appendix in Zingel (2006).*
[20] *See OeNB and FMA (2006, p. 63).*
[21] *See OeNB and FMA (2006, p. 63).*
[22] *See OeNB and FMA (2006, p. 64).*

Chart 1

Systematic Presentation of Capital Concepts



Source: OeNB and FMA (2006, p. 65), author's additions.

age potential that must, at minimum, be held in reserve so that credit institutions can remain solvent should the predefined maximum stress scenario occur."[23] Such extreme stress scenarios are usually not covered by VaR calculations as these are based on the assumption of "normal" market conditions.

Credit institutions can employ economic capital to manage their business operations by using it as a basis for allocating capital to their individual operational areas, as a basis for calculating risk-adjusted ratios and for limiting risks. The use of regulatory capital for internal management purposes has so far been problematic insofar as its calculation under Basel I rests on rather general assumptions. Under Basel II, regulatory capital is brought more closely into line with economic capital, thus rendering management by regulatory capital more effective.[24] Nevertheless, the problem remains that the regulations are still portfolio-invariant, which is an argument against basing credit portfolio management on regulatory capital.

Harmonizing regulatory capital with economic capital is also necessary so as to mitigate to the greatest possible extent any disincentives that might arise from differing definitions or interpretations of capital and the consequences of such disincentives. Of key importance here is regulatory arbitrage, whereby credit institutions take advantage of "differing regulatory capital requirements as well as differences between true economic risks and those measured in accordance with the Basel Capital Accord"[25] for their own benefit, but with detrimental repercussions for

[23] *See Schierenbeck (2003, p. 21).*

[24] *See OeNB and FMA (2004, p. 64–65).*

[25] *See BCBS (1999), p. 6.*

the stability of the banking sector.[26] As borrowers' credit risk only plays a minor role under Basel I, credit institutions are prompted to remove items with low economic risk (i.e. high-quality assets) from the balance sheet, which results in a deterioration in the quality of the loan portfolio and thus higher economic risk. Although Basel II alleviates this problem by introducing more risk-sensitive capital requirements, it is not entirely resolved given the lack of homogeneity within rating categories.

Any comparison of regulatory capital and economic capital should take into account that, according to a survey conducted by the Deutsche Bundesbank, there is no uniform definition of economic capital. Although most credit institutions manage their operations on the basis of core capital, some supplementary capital components (e.g. nonrealized reserves or preferred stock) are also used.[27]

3 The Capital of Austrian Credit Institutions

3.1 Capital Adequacy of Austrian Credit Institutions

Given the expansion of Austrian credit institutions in recent years, risk-weighted assets (or their assessment base) have gone up significantly, and so have capital requirements. Austrian credit institutions' overall capital requirements, which are composed of capital requirements for solvency, for the securities trading book, for open foreign exchange positions and gold as well as for eligible non-equity interests, came to some EUR 32,042 million on an unconsolidated basis (consolidated: EUR 38,318 million) in September 2006.

With an unconsolidated volume of EUR 59,660 million (consolidated: EUR 57,674 million), capital held by banks thus exceeded the increased capital requirements by a wide margin. The fact that Austrian banks' capital ratios surpass the minimum capital requirements clearly reflects this situation. The capital ratio indicates regulatory capital adjusted for market risk in relation to the assessment base; chart 2 shows the development of capital ratios for various sectors in recent years (on an unconsolidated basis).

First and foremost, the chart reveals that capital ratios vary widely across sectors. For instance, state mortgage banks and building and loan associations exhibit a far lower capital ratio than other sectors over the entire period under review – a fact that is attributable to the specific business operations these credit institutions engage in and that should not be considered negative as their capital ratios surpass the 8% level by a wide margin. Among the other sectors, savings banks noticeably have a higher capital ratio than cooperative banks (Raiffeisen and Volksbank credit cooperatives) and, with the exception of 2005, always outperformed the rest of the sector (apart from special purpose banks[28]) in capital ratio terms. A positive point to note is that the capital ratio of the sector as a whole went up in the period under review, attaining a value of 15.22% (unconsoli-

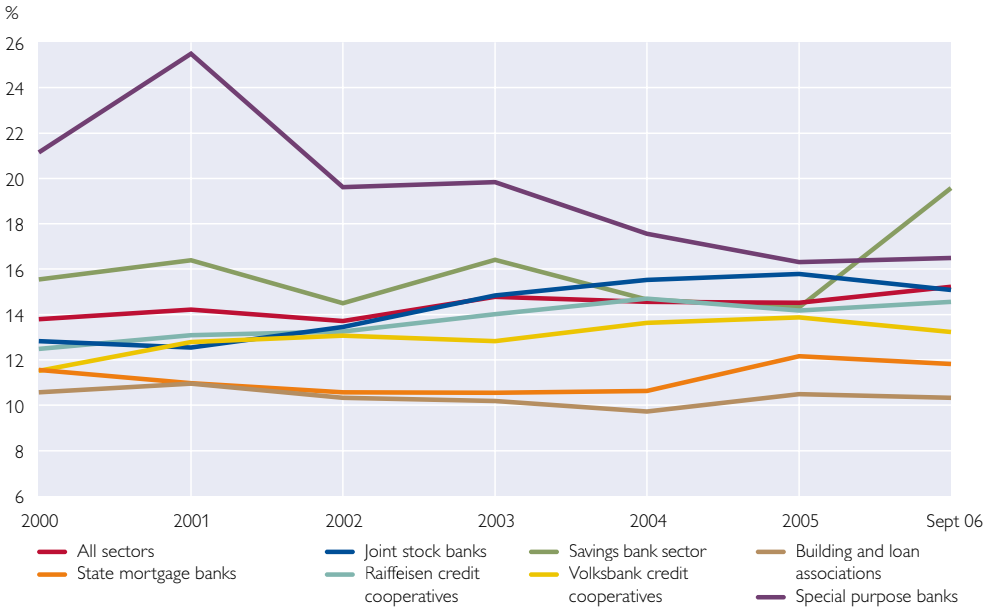
[26] *For the different options relating to capital or regulatory arbitrage and their underlying principles, see Jackson et al. (1999, p. 22–25), and Jones (2000, p. 40–47).*

[27] *See Deutsche Bundesbank (2002, p. 41).*

[28] *Special purpose banks are not comparable with other sectors owing to separate developments and limited banking licenses.*

Chart 2

Unconsolidated Capital Ratio in Austria by Sector (%)



Source: OeNB.

dated) and 12.22% (consolidated) in September 2006. These values also compare favorably in an international context. According to the ECB, the average capital ratio of major European banks stood at 11.2% in the first half of 2006.[29]

It should be highlighted here, however, that these current capital ratios merely reflect a temporary rise that was fairly strongly influenced by the capital increases carried out by major banks to finance their foreign operations.

3.2 Capital Composition

A qualitative analysis of Austrian banks' capital shows that the share of core capital in total capital went up across all sectors in the past few years, coming to almost 66% on an unconsolidated basis[30] and around 70% on a consolidated basis across the entire sector in September 2006. At the same time, the tier 1 ratio reached approximately 10.5% on an unconsolidated basis and almost 9% on a consolidated basis. Compared with the tier 1 ratio of 8% calculated by the ECB on data from major European banks,[31] Austria's current ratio is quite favorable. This situation is primarily attributable to the capital increases carried out by major Austrian banks to finance their expansion in Central and Eastern Europe.

In view of the exclusive capital requirements for unexpected loss under the IRB approach (which will generally reduce the ratio of core capital requirements to overall capital requirements), it remains to be seen

[29] *See ECB (2006, p. 88, as well as appendix, p. 24).*

[30] *In calculating the share of core capital in total capital, the deduction items were directly deducted from the capital components (50% of core capital and 50% of supplementary capital).*

[31] *See ECB (2006, p. 88, as well as appendix, p. 24).*

how the level of core capital and its percentage share in total capital will develop in future.

The composition of core capital reveals that disclosed reserves have increased at a disproportionately fast pace in recent years, attaining a share of some 84% in September 2006. As a result, they accounted for the lion's share of tier 1 capital, while paid-up capital accounted for a share of around 16%, with the fund for general banking risks making up the rest (about 1%).

Apart from core capital, the share of supplementary capital also augmented in the past few years (at the expense of short-term subordinated capital), which led to an improvement in the quality of capital held by Austrian banks. It should generally be noted that such an increase in eligible supplementary capital may be traceable to two factors: (1) an actual increase in these capital items or (2) the enhanced eligibility of supplementary capital caused by an increase in core capital.

3.3 Results of QIS5

The fifth Quantitative Impact Study (QIS5) recently analyzed the impact the new Basel II capital regulations will have on banks' capital requirements. Austrian credit institutions did not participate in QIS5. Results for Germany, however, show that for the entire German banking system, regulatory capital requirements decreased by 6.7% compared with Basel I. However, table 2 shows clear differences between the different bank groups (group 1 vs. group 2[32]) and the different approaches to calculating credit risk.[33]

Across all approaches, group 2 banks posted a more pronounced decrease in capital requirements compared with the corresponding approaches for group 1 banks. The capital requirements for group 2 banks decreased most sharply when the advanced IRB approach was used (–26.9%); applying the foundation IRB approach resulted in a 8.3% decrease, while using the standardized approach produced the smallest re-

Table 2

QIS5 Results (Germany)

Approach	Number of banks	Change in minimum capital requirements (Δ MCR)	Results expected if most likely approach is implemented (Δ MCR)
Group 1			
Standardized approach	12	8,4%	
Basic IRB	13	–1,0%	
Advanced IRB	6	–5,2%	
			–4,2%
Group 2			
Standardized approach	85	–5,4%	
Basic IRB	61	–8,3%	
Advanced IRB	5	–26,9%	
			–8,4%
Overall aggregated result			–6,7%

Source: Deutsche Bundesbank (2006, p. 6).

Note: MCR = minimum capital requirements.

[32] *In this instance, group 1 banks are internationally active diversified banks with a minimum core capital of EUR 3 billion. Group 2 banks are all other credit institutions that do not belong to group 1.*

[33] *See Deutsche Bundesbank (2006, p. 5–6).*

duction (–5.4%). For group 1 banks, the IRB approaches also resulted in lower capital requirements (–5.2% in the advanced IRB approach and –1.0% in the foundation IRB approach). By contrast, capital requirements went up by 8.3% when the standardized approach was applied. According to the Deutsche Bundesbank, these differing results are attributable, above all, to the generally higher share of retail exposure in group 2 banks.[34]

The results observed for Germany are around the same scale as international findings (G-10 and EU Member States). However, the standardized approach yields stronger deviations for group 1 banks (which is not of major importance as this approach is not relevant to these credit institutions) and the foundation IRB approach results in greater deviations for German group 2 banks. In both cases, the capital requirements of German credit institutions markedly exceeded their international equivalents.[35]

Given the QIS5 results for German group 2 banks, a decline in the capital requirements for credit risk can also be expected in Austria, in particular when the IRB approaches are used.

4 Conclusion

This contribution examined the impact of the new Basel II capital regulations on the definition of regulatory capital. Whereas the concept of (regulatory) capital frequently underwent major revisions in recent decades, the definition of capital in the new Austrian Banking Act (§ 23) remains essentially unchanged. It is based on the definition laid down in the 1988 Basel I Capital Accord and specifies that capital is composed of the capital components of core capital and supplementary capital as well as short-term subordinated capital, which was introduced in 1996 in order to cover market risks. In addition, hybrid instruments are recognized to a certain extent as consolidated capital. The recent amendments made to the Austrian Banking Act mainly reflect the exclusive application of capital requirements to unexpected loss under the IRB approach. However, this calibration of unexpected loss obliges credit institutions to compare expected loss amounts with their provisions levels. If expected losses are less than value adjustments and provisions, the difference may be recognized as capital; where expected losses exceed value adjustments and provisions, the difference must be deducted from capital.

Although the definition of capital will remain largely unchanged for the time being, there are plans for future adjustments to account for two circumstances. First, current national discretions and differing accounting standards will lead to differences in the eligibility of individual forms of capital. Second, the above-mentioned exclusive capital requirements for unexpected loss and the related changes in the treatment of loan loss provisions will generally reduce the ratio of core capital requirements to overall capital requirements.

An analysis of Austrian banks' capital ratio draws a favorable picture from both a quantitative and qualita-

[34] *See Deutsche Bundesbank (2006, p. 5–6).*

[35] *See Deutsche Bundesbank (2006, p. 6–7).*

tive perspective. While the capital ratio went up in recent years (across all sectors), capital composition improved on the back of a disproportionately rapid increase in core capital. The latter situation is attributable, above all, to the capital increases carried out by major Austrian banks to finance their expansion in Central and Eastern Europe.

The future development of capital requirements will depend to a considerable extent on the approaches credit institutions choose to calculate capital requirements. The results of the fifth Quantitative Impact Study (QIS5), which was conducted on the basis of the latest formulas for deriving risk weights, reveal that there are clear incentives for banks to implement advanced measurement approaches (also in the area of operational risk). As for credit risk, lower capital requirements can be expected on a sector-wide basis.

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Demographic Change, Bank Strategy and Financial Stability

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The purpose of this article is to disseminate the main results of the program "Ageing and Its Implications for Banks and Bank Strategy" of the Oesterreichische Nationalbank's (OeNB's) Financial Markets Analysis and Surveillance Division and to draw conclusions about the implications of aging for financial stability. The first question that arises is whether demographic change is relevant for banks and financial stability at all. The paper answers this question in the affirmative and goes on to analyze the impact of demographic change on the environment in which banks operate, i.e. on economic growth, interest rates, and residential real estate markets, and on the level and composition of household demand for bank services and products. The article summarizes how banks might adapt their strategies in response to demographic change. Finally, it draws conclusions about the potential implications for financial stability.

JEL classification: G21, J10
Keywords: banks, demography, ageing, financial stability.

1 Motivation and Objectives

The purpose of this article is to disseminate the main results of the program "Ageing and Its Implications for Banks and Bank Strategy" of the Oesterreichische Nationalbank's Financial Markets Analysis and Surveillance Division and to provide information about the implications of aging for financial stability. The objective of the program was first, to discuss the impact of negative population growth, increasing longevity and migration on banks and bank strategies over a horizon of up to 20 years and second, to draw conclusions about the stability implications for the banking system. The program consisted of an issue paper (Wood, 2006) and two workshops on "Ageing and Its Implications for Banks and Bank Strategy" in April and September 2006, respectively. The first workshop was devoted to the impact of demographic change on the banking environment, i.e. on economic growth, real interest rates, and residential real estate markets, but also included a presentation on demographic projections for Austria and the EU and presentations on the impact of demographic change on banks. The second workshop focused on the strategic responses of banks to demographic change. It made the findings of the first workshop accessible to banking consultants and bank strategists. As part of the program, the OeNB also put the issue on the agenda of the ESCB's Banking Supervision Committee and led the respective study group.[1]

The program was motivated by the important role financial stability plays for the OeNB and the ESCB, in addition to their main objective of preserving price stability.[2] In addition to the study of current developments, the anticipation of potential long-term developments in the economy and their effects on the banking system form an integral part of macroprudential supervision.

While the literature on aging and its consequences for the macroecon-

Referred by:
Markus Knell, OeNB.

[1] *ECB (2006).*
[2] *Treaty on European Union OJ C 191, 29.7.1992.*

omy, financial markets, and public finances has grown rapidly in recent years, the impact on banks has received little attention so far. A number of European and international institutions have studied the impact of aging from various perspectives: The Economic Policy Committee and the European Commission published a study in which the effect of demographic change on public expenditure in the areas of pensions, health care, long-term care, education and unemployment transfers are projected for all EU-25 Member States until 2050.[3] The Group of Ten studied the implications of aging for financial markets.[4] In 2006, the ECB's Monetary Policy Committee and the Governing Counsel engaged in intensive discussions on the impact of demographic change on the macroeconomy, on the current account, and – of course – on monetary policy. Given the intensive study of the impact of aging on so many subsectors of the economy, it is striking that its effects on banks and bank strategy have received so little attention. The OeNB's program has now closed this gap.

2 The Key Issues and the Conceptual Framework

The first question that arises is whether demographic change is at all relevant for banks and financial stability. We identified three main channels of interaction between demographic change and banking that provide the basis for an affirmative answer to this question: First, banks are exposed to the repercussions of demographic change indirectly via its impact on the macroeconomy, on financial markets, on real estate markets and on household portfolio composition. Second, the increasing volume of funded pension provision and the blurring boundaries between banks and more traditional providers of age-related products have increasingly exposed banks to risks related to demographic change. This is illustrated by examples from the Austrian market: banks play an important role as shareholders of occupational pension funds and they are providers of capital guarantees for pension products. Third, demographic change can result in changes to the product portfolio of banks.

The conceptual framework for the analysis rests on the theory of financial intermediation, on contractual and market incompleteness as well as on the risks inherent to the structure of banks' balance sheets.[5] To analyze the impact of the program's findings on financial stability, we look at selected items on banks' balance sheets and the profit and loss accounts.

The key issues of the paper are the following: What is the main content of current demographic projections (section 3)? How could demographic change affect the environment in which banks operate (i.e. economic growth, interest rates, and residential real estate markets) (section 4)? How do the banks that presented at the workshops (plan to) react to demo-

[3] *Economic Policy Committee and the European Commission (EPC/EC) (2006).*

[4] *OECD (2005).*

[5] *Wood (2006).*

graphic change (section 5)? What are the potential financial stability implications of these reactions (section 6)?

3 Demographic Change

Demographic projections for the European Union (EU) and for Austria provide the quantification of what we consider "aging" throughout the article, namely decreasing fertility, increasing longevity, and the growing importance of migration for demographic developments.

Although the world population is expected to grow from 6.1 billion in 2000 to 8.9 billion by 2050, an increase of 46%, population growth rates are declining in most major economic areas.[6] The median age in the EU is expected to increase from 38 to 48 between 2000 and 2030, while the median age worldwide will eventually converge to approximately 45 until 2050. The distribution across age groups will change with a substantially growing elderly and a decreasing young population.

The EU will experience the lowest fertility rates worldwide and a standstill of natural population growth. In addition, the increase in longevity and the continuing dynamics of international migration will contribute to significant changes of the demographic structure. Overall, the population in the EU-25 is expected to grow until 2025 due to net migration effects but to fall thereafter. The share of the young population aged 0 to 24 will approach 23% in the EU as well as in Japan, while it is expected to reach 30% in the U.S.A. At the same time, people aged 80+ will represent 12% of the EU's overall population by 2050, compared to 15% in Japan and 7% in the USA.

Austria will follow the EU trend of a natural population decline, but the population will nonetheless grow to approximately 9 million by 2050 due to net immigration. At the same time, the structure of the population will change broadly in line with the EU average from 2005 to 2050. The share of people between 0 and 24 years of age is expected to decrease from 28% to 24%, whereas the share of people aged 65+ will increase from 16% to 28% and that of people aged 80+ from 4% to 11%. However, the economically relevant total dependency ratio[7] will increase only very modestly from 101% to 108%.[8] From a regional perspective, the population will grow in urban areas around the main economic centers, whereas the peripheral regions will lose residents.

Overall, the future sizes of current and past birth cohorts can be projected with some accuracy, while future fertility rates, longevity and net migration are outcomes of very complex societal, social and economic dynamics. Thus the uncertainty associated with long-term demographic projections is high.[9] Nevertheless, they provide consistent scenarios to evaluate particular opportunities and challenges for societies in the coming decades.

[6] *The demographic projections are drawn from Lebhart (2006).*

[7] *Here, the total dependency ratio is defined as the ratio of noneconomically active persons (i.e. pensioners, children, the unemployed) to economically active persons (i.e. employed or self-employed persons).*

[8] *Tichy (2006).*

[9] *Tichy (2006) draws attention to the large differences between the projections for Austria published in 2003 and 2005.*

4 The Impact of Demographic Change on the Banks' Environment

The main results of workshop I on the impact of demographic change on the banking environment have already been documented[10] and shall be summarized only briefly here.

The impact of demographic change on *economic growth* is expected to be modest compared to the recent growth experience in the euro area. For the euro area, the European Commission projects GDP per capita growth rates to average 1.8% per annum[11] until 2030. The historical value over the period 1981 to 2005 is even lower at 1.75% per annum. Although the projected growth rates are similar to historical values, their compositions are different. Annual GDP per capita growth rates consist of two components: the growth contribution of increasing labor productivity, and the growth contribution of changes in the input of labor. The first component contributed 1.9 percentage points to GDP per capita growth in the period 1981 to 2005, while the second one accounted for –0.15 percentage point per annum. The EU Commission's projections until 2030 expect the growth contribution of labor productivity (1.6 percentage points) to be lower than the historical value, while the growth rate of labor input is much higher and even positive (+0.2 percentage point). The low projections are attributable not to demographic change but to low projections of the future contribution of labor productivity.

Why is the future contribution of labor productivity so small? This is mainly a consequence of the low contribution of capital deepening to labor productivity growth, which is projected to equal 0.60 percentage point per annum compared to its historical value of 1.12 percentage points per annum. The latter in turn follows from the assumption that capital per efficiency unit remains constant from 2030 to 2050 in the EPC/EC (2006) study. This assumption leads to a downward bias in the projected growth rates of capital stock. The EPC/EC assumes that the growth rate of efficiency units (the growth rate of labor input plus labor productivity) and – on the equilibrium growth path – that of the capital stock are 1.6% per annum. This is below the historical average of 3.5% per annum over the period 1980 to 2001, which in fact exceeded the growth rate of efficiency units of roughly 2.2% per annum by 60%.[12]

Tichy (2006) concluded that the impact of demographic change on future GDP growth rates would be very modest, as he expected decreases in numbers of working-age individuals to be (partly) compensated by increases in participation rates, more and better human capital, more capital-intensive production, and factor-induced technical progress.

The impact of aging on *long-term real interest rates* is expected to be more pronounced than that on GDP per capita growth rates, given that the capital intensity of production will rise to compensate for a decline

[10] *ECB (2006, p. 23–28) and Schmitz (2007).*

[11] *Gomez-Salvador et al. (2006).*

[12] *Timmer et al. (2003, tables 6, 10, 11). For a detailed discussion of the EPC/EC (2006) and the OECD (2005) projections, see Schmitz (2007).*

of the working age population.[13] The OECD projects the long-term real rate of interest to decline by between 0.3 and 0.7 percentage point until 2025 in Germany, France, Japan and the U.S.A.[14] This impact seems to be modest relative to past fluctuations of real interest rates. To examine the causes, Schmitz (2005) integrates demographics into a simple neoclassical growth model. Two opposing effects are at work in determining the impact of demographic change on long-term real interest rates: The increasing capital intensity of production exerts downward pressure on the marginal productivity of capital, while the increasing share of consumption of noneconomically active persons decreases aggregate savings and exerts upward pressure on the long-term real interest rate. In a simulation exercise for Austria, the author demonstrates that the former effect dominates and that long-term real interest rates would fall in the model roughly in line with the OECD projections. Given that funded pensions are a long-term investment of up to 60 years, even modestly declining interest rates can have a large impact on future pensions. Schmitz (2007) presents simulation results for Austria in which a modest decline of long-term real interest rates leads to cuts of up to 15% of funded pensions (even under the international diversification of investments and the international integration of real capital and goods markets). Winter (2006) argued that the privatization of pensions would exacerbate the decline in the long-term real rate of interest, while international diversification would dampen it slightly. International diversification also entails a reallocation of production, as capital exports would have to be accompanied by net exports of goods and services in the net accumulation phase to avoid a depreciation of the home currency. In the net decumulation period, the net dissaving of pensioners would reverse this trend and lead to an appreciation of the home currency, which would reduce the real return on internationally diversified investments in terms of the home currency unless pensioners spend their foreign savings mainly on foreign goods and services. In short, large exports of capital in the accumulation phase would be accompanied by real economic effects on the structure of production and the balance of payments.

The impact of demographic change on *residential real estate markets* is quite intricate to project. The demand for housing units and space is driven by the number, size, and age structure of households rather than by the size and age structure of the population. For Germany, Robischon (2006) expects the number of households to grow slightly until 2020 mainly due to the growing proportion of one- and two-person households and of small elderly households. The aggregate level of demand for residential real estate will not be strongly

[13] *For a discussion of the impact of demographic change on aggregate savings and financial markets see, inter alia, McCarthy and Neuberger (2003) and Schmitz (2007), who find that the econometric studies remain inconclusive and are confronted with substantial methodological problems.*

[14] *OECD (2005). The study covered only these four countries. The results are roughly in line with the studies available for other countries (see ECB 2006, p. 25). However, one must bear in mind that the methods applied in EPC/EC (2006) and in OECD (2005) differ substantially. The extrapolations in the former are based on an exogenously fixed long-term real interest rates, while the simulations in the latter endogenize the long-term real rate of interest.*

affected by demographic change, but its geographical distribution could change. Increasing mobility and a higher diversity of lifestyles and cultural backgrounds might lead to a very dynamic housing market with local oversupply or supply shortages and increasing price dispersion and volatility.[15] External and internal migration and differences in local demographic dynamics may lead to large differences in the evolution of the size and the age structure of local populations within countries.[16] Larger cities and central regions (e.g. Berlin, Vienna, Paris) profit from these developments and tend to be demographically younger, while peripheral rural areas may experience rapidly declining and aging populations. The ensuing brain drain – a consequence of the higher mobility of the young and better educated – would accelerate regional economic decline and increase the incentives to emigrate. The income gap between prospering centers and declining peripheral areas could increase, which would be mirrored by a widening gap in housing demand and housing prices.

5 The Impact of Demographic Change on Banks and the Banks' Strategic Responses

This section presents the common traits of banks' strategies in response to demographic change based on the presentations of financial consultants and bank strategists at the two workshops.[17]

5.1 Demographic Change Has an Impact on Banks and Their Strategies

Vooght (2006) emphasizes that banks frequently had to cope with demographic change in the past, i.e. increases in mortgage lending and construction finance during periods of strong population growth in Western Europe in the 1950s and 1960s. However, demographic change is part of a broad set of factors that are considered important in strategic planning. At the bank Citigroup, these consist of the growing share of world income accrued by (current) non-OECD countries and their increasing geopolitical influence, economic globalization, the changing structure of (Continental European) financial systems, but also of ecological threats, natural resource constraints and religious developments.[18]

[15] *Citing data from the city of Leipzig, Robischon demonstrated that even within the city, various districts experienced large changes in population size (±10%) over the relatively short period from 2000 to 2004. This led to large shifts of housing demand in opposing directions even within local markets.*

[16] *Tourdjman (2006).*

[17] *Bosek (2006), Hedrich (2006), Kraft-Kinz (2006), Raab (2006), Thompson (2006), Tourdjman (2006), Vooght (2006), Weiss (2006).*

[18] *Thompson (2006).*

5.2 Impact on Household Demand Is Considered Most Important

Banks regard the impact of demographic change on household demand as the most important channel of transmission. It is expected to reduce the demand for mortgages, consumer credit and basic financial services (demand deposits, payment services).[19] Since the 1980s, household portfolio composition has undergone significant changes in many OECD countries, shifting from bank deposits toward investment funds, funded pension provision as well as stocks and bonds.[20] This trend is anticipated to accelerate. In addition to the search for yields, the debate about the future of the public pension system is set to motivate households to invest increasingly in alternatives to savings accounts. Banks are reacting to that trend by increasing product innovation, adapting distribution channels, and targeting marketing strategies to the 50+ generation.

– In countries with aging populations, the banks' *product portfolio* will change. Loans and deposits will remain part of the product portfolio offered, but will cease to be the core of the customer relationship. Product portfolios will increasingly contain integrated products and services (e.g. products that structure the decumulation of wealth, target funds, guaranteed products as well as longevity insurance), near-financial services (e.g. advice in handling bequests), and nonfinancial services (e.g. health and long-term care). As a reaction to international migration, internationally active banks also plan to gain market share in international remittances. Many banks already offer reverse mortgages as a response to changing market demand: smaller cohorts of the main target group for mortgages could imply lower demand for mortgages. At the same time, the increasing share of households aged 55+ with a sizeable share of wealth invested in residential real estate creates a market for products that help to liquidize and generate income from this illiquid asset class. One bank emphasizes the strategic importance of the emerging asset class of infrastructure investments for institutional and public clients. It plans to expand in this area in the future by engaging in financing more infrastructure projects.[21] Such projects merge the return on equity and steady cash flows with inflation protection and long-term maturity, making them a good addition to pension funds' assets to match their liabilities. For governments, they reduce the burden for public finances while maintaining the momentum in infrastructure development necessary to support competitiveness and growth. A strategic question for Austrian banks is whether to develop innovative products themselves or whether to rely on white-label products of international financial institutions. To a large extent, they

[19] *Weiss (2006) estimates that bank revenue will shrink substantially until 2050 due to aging. In Germany, total expenditure on financial services is projected to drop by about 19%, and the interest and commission surplus to decline by 25% from 2005 to 2050. In Austria, the interest and commission surplus is projected to drop by 10%.*

[20] *OECD (2005, table I.4, p. 18).*

[21] *Thompson (2006).*

already cooperate with international partners in the area of investment funds, but often integrate these components into own-label products.

– Banks continue to shift the *distribution* of traditional basic banking services (e.g. payment services) to automated channels (i.e. self-service areas, Internet banking) to free resources for new distribution channels. There is broad agreement among presenters that long-term customer care concepts are key to acquiring new and retaining existing customers. These concepts consist of comprehensive personal advice, tailor-made financial portfolios, and long-term relationship management. Banks will have to offer many services they used to reserve for private banking customers a decade ago to a broader market. This requires banks to rebalance their human resources mix from cashiers toward financial advisors and to lower the turnover ratios among their sales personnel. As a consequence, personnel costs might increase. Current incentive structures would have to change, too, and move from volume-based incentives to ones that reward long-term customer satisfaction. Wealth in most developed countries is concentrated among the generation aged 50+. This target group is expected to move further into the focus of attention of financial service providers. Competition for wealthy clients who are also more demanding and more willing to switch financial service providers is becoming fiercer, increasing the cost of customer acquisition and retention.
– *Marketing strategies* will increasingly entail market segmentation.[22] Brand loyalty is becoming more important to retain customers. The penetration of the 50+ age group requires a special marketing concept comprising specialized employee training, enhanced branding, and more personnel-intensive distribution channels. To protect their brands, banks need to focus (even) more on improvements of corporate governance, compliance, and risk management. Quality management in advisory services is gaining importance.

5.3 International Diversification Is Playing an Increasingly Important Role

There is broad agreement about the importance of *international diversification*. The different demographic developments in various regions of the world provide opportunities for banks, enabling them to fund their asset growth in countries with younger populations by means of liabilities in countries with aging societies. In the former countries, the markets for traditional bank services (consumer credit, mortgages and microfinance, payment services) are expected to post strong growth. Geographic diversification is the response to two interdependent challenges: retail and institutional customers require borderless services and higher returns; banks seek new markets. For global banks, prominent examples are China and India. Both countries have

[22] *However, the role of market segmentation is not undisputed. Hedrich (2006) argues that customers might feel offended if addressed as "aging customers with special needs."*

growing economies and expanding middle classes. Starting from low levels of financial intermediation, these countries' financial sectors are projected to grow over the next decades. India is also expected to face population growth. For more regionally oriented banks in Austria and Germany, the focus clearly rests on the Central and Eastern European countries (CEECs), despite the demographic challenges these societies face. The economic catching-up process, increasing intermediation ratios, and the relocation of production to the CEECs are expected to boost market growth.

5.4 Adaptation of Mortgage Policies Envisaged

Real estate price developments are considered to be influenced by demographic change. Banks need to adapt their *mortgage policies*. Low fertility and urbanization lead to a vicious cycle for many peripheral areas across Europe. Increasingly, price developments can strongly and unexpectedly diverge between neighboring districts. Residential real estate price volatility may increase. Banks that have already experienced exacerbated regional demographic change in recent years due to internal migration claim that they have by now factored these developments into the valuation models for residential real estate collateral and into the pricing models of mortgages.

5.5 Branch Network Strategy May Require Reorientation

Demographic change might impel banks to rethink their *branch network strategy*. While branches were mostly seen as cost factors in the last decade, their role as distribution channels and advice centers is expected to increase again. Moving will remain common over the age of 60. Younger pensioners will seek "fulfillment" after retirement (e.g. by moving to traditional holiday destinations) but will probably move back closer to cities and their relatives after the age of 75. This would result in rethinking geographic proximity and the establishment of branch networks in locations to which aging clients move. That might also include the establishment of specialized branches in foreign countries to which banks' affluent clients move (e.g. British and German banks that establish branches in Spanish and French costal regions). Internal migration and the divergence of economic performance also affect the regional development of bank revenues. For banks that have high market shares in declining peripheral areas, demographic change calls for a strategic focus on increasing market share in increasingly prosperous centers. Some banks plan to respond to international migration and high shares of migrants in prosperous centers by increasing the share of own staff with a migration background.

5.6 Maintaining Strategic Relevance Is Central

Banks are under increasing competitive pressure from nonbank financial intermediaries and new market entrants (e. g. retail chains). In order to *maintain strategic relevance* for their customers, banks need to offer superior service as well as superior risk/return profiles, and they should focus on their core competences. This could prompt banks to focus on specialist niche markets where they can gain a maximum competitive advantage. They could specialize on a particular product, service, process or geographic territory. Banks could fo-

cus on the provision of pure advisory services, on the production or on the distribution of financial products. At the other end of the spectrum, (large) banks could choose to offer the full range of standardized banking services and products to a mass market combined with more advice-intensive personalized services for selected customer segments. Size and international reach might also be a competitive advantage for the production of financial products, which are then distributed either directly as own-label products or via smaller, more regionally focused banks (white-label products). Controlling costs and delivering sustainable margins are core competences for the strategic orientation toward the mass market. However, Hedrich (2006) voices a deviating opinion on the strategic relevance of demographic change for banks: He argues that aging has more operational than strategic consequences for banks; the main objective of the banks' boards should be raising awareness throughout the company to the issue of demographic change and its potential impact on the bank's profitability in the future.

5.7 Human Resource Management Will Be Influenced

Demographic change also affects banks' *human resource management* and the age structure of their employees. Some banks' age structures showed relatively low shares of lower and higher age groups and a concentration of employees in the 35 to 50 age group in 2004. Without an immediate response, this would imply a shortage of experienced staff in 2030, when baby boomers retire. In addition, the age profile would no longer correspond to the age structure of the population. An aging workforce increases personnel costs (e.g. higher salaries and absence costs). In addition, older employees are often classified as less resistant to stress, less flexible, and less willing to learn than their younger colleagues. Banks are addressing these problems by increasing training across all age groups, intensifying recruiting, entering new markets to recruit and expanding knowledge management capacities. In order to maintain high productivity among higher age groups, banks are focusing on health management to reduce absences, building teams of mixed age groups, and offering more flexible part-time models. Some banks are attempting to develop a corporate culture that ensures that the company remains "young" despite an aging workforce.

6 Financial Stability Implications

The conceptual framework for this section rests on selected items on the bank balance sheet and the profit and loss account.[23] These are loans to customers (mortgage loans, consumer loans, loans to small and medium-sized enterprises – SMEs) and debt securities (especially long-term government bonds) on the asset side, and deposits, debt certificates, and loan loss provisions on the liability side. But we also take into account some off-balance sheet items (i.e. guarantees and hedging instruments in general). The selected items on the profit and loss statement are interest and noninterest income on the income side, and interest payable, staff costs

[23] *The framework follows our approach in ECB (2006).*

and loan loss provisions on the expense side. This section is structured along the lines of the common traits of banks' strategies in response to demographic change presented in the previous section. The questions we focus on are: What are the main risks that might emerge from banks' strategic responses? How can supervisors (and other public authorities) react to these risks?[24]

6.1 Bank Profitability Will Come under Downward Pressure

The expected effects of demographic change on household demand for traditional bank products and services could translate into downward pressure on *bank profitability*. Lower bank profitability results from a number of factors: intensified competitive pressure, worsening cost-income ratios, and lower revenues from maturity transformation.

– Lower growth rates in the market for banking intermediation could lead to *higher competitiveness*. The growth rate can be decomposed into the growth rates of the following components: the banking intermediation ratio, GDP per capita, and the population. If aging leads to a lower growth rate of the market for banking intermediation, competitive pressure in the market could increase. If banks' strategies focus on the growth of market share or at least aim at avoiding shrinking revenues, banks will have to choose more aggressive and more competitive strategies.[25] The banking markets' growth rate might be negatively affected by demographic change through the following channels:

  First, the structure of Continental European financial systems has changed in recent decades. The role of financial markets and non-bank financial intermediaries has grown.[26] Aging is expected to amplify this trend through its impact on household portfolios (i.e. an increasing share of funded pensions and investment funds at the expense of savings accounts). Many banks expect the demand for SME and consumer loans as well as for mortgages to decrease. Thus, the downward pressure on the bank intermediation ratio might grow.

  Second, although regarded as unlikely in section three, the possibility still remains that demographic change might negatively impact GDP per capita growth rates.

  Third, demographic change will reduce the growth rate of the population.

– At the same time, changing household demand for traditional bank products and services could cause banks' *cost-income* ratio to increase.

  First, the reduction of household acquisition of savings accounts will force banks to seek other funding sources with – usually – higher funding costs. At the same time, the increasing importance of long-term customer relation-

[24] *These questions are addressed under a ceteris paribus assumption relative to a world without demographic change. They are necessarily speculative, given the period of 10 to 20 years to which they apply.*

[25] *However, a second-round effect could attenuate the impact of higher competitiveness, as it might further amplify the market consolidation process in the EU.*

[26] *European Commission (2006).*

ship management, advisory services and personalized financial products will increase operating costs relative to a world in which standardized products are sold to a mass market. The composition of staff is expected to shift toward better trained employees, which increases personnel cost (both through higher salaries and through increasing training costs for an aging workforce). Banks plan to actively address the problem by striving to increase efficiency and cut costs in other areas. The increasing role of brand loyalty was pointed out above. This has ambiguous stability effects: On the one hand, it increases marketing costs and reputation risk, which both have detrimental effects on bank costs and stability, respectively. On the other hand, as Vooght (2006) points out, it increases banks' incentives to protect their brand by improvements in compliance, risk management, and corporate governance, which have positive effects on bank stability.

Second, lower demand for traditional bank products (loans) decreases interest receivable from banks' traditional core business.

– Demographic change is projected to exert downward pressure on long-term real interest rates. Short-term real interest rates are determined by monetary policy, and we are not aware of any studies that suggest that aging would have a direct impact on them. Short-term real rates are determined by the structural liquidity deficit, liquidity preferences, liquidity demand and supply on the money market. Therefore, aging leads to a flatter yield curve, ceteris paribus. That reduces bank revenues from maturity and liquidity transformation, reduces *margins and net interest income*. It further amplifies the pressure on profitability.

Lower bank profitability reduces the ability of banks to absorb adverse shocks by profits in the respective period. Shocks can more easily hit bank capital adequacy ratios. This implies a higher volatility of bank capital reserves, which could also translate into a higher optimal level of reserves. The immediate implications for supervisors are modest, since bank capital adequacy has been at the center of supervisory attention for a while now. The recent introduction of the capital adequacy directive in 2006 in the EU improved the framework, so that potential negative impacts of aging on profitability do not call for immediate action by supervisors or regulators to further adapt the capital adequacy regime. However, in the future the statutory minimum capital adequacy ratio might be reviewed in the light of the increasing reliance on the shock absorption capacity of bank capital.

6.2 Changes of the Bank Product Portfolio Will Give Rise to Risk

There are additional risks that emerge from changing household demand for traditional bank products and that can have stability effects:

– Changing household demand spurs innovation in banks' product portfolios. New products can increasingly expose banks and households to *operational, reputation, and legal risk* (relative to traditional products). For supervisors, this calls for the proactive analysis of these risks' potential financial stability implications.

Wood (2006) reports that reverse mortgages bore substantial reputational risk for U.K. banks in the early years. Households often misjudged the high costs associated with this product, which in fact is a bundle of credit and insurance components, each of which carries a price in terms of the divergence between the current value of the residential real estate asset and the discounted expected value of the future annuities. Households found it difficult to adequately assess the true costs of the product. The bundling of credit and insurance products in reverse mortgages makes them complex products which require sophisticated regulatory frameworks to reduce legal risk. Provisions that increase market and price transparency for consumers and ensure adequate consumer protection might be called for. In countries that have not yet put in place specific regulations, bank supervisors might want to proactively set the issue on the agenda.

– In addition, banks are expected to be increasingly exposed to traditional *insurance* risks (i.e. longevity risk, health care risk). For supervisors, this poses the challenge that the traditional functional and organizational boundaries between banks and insurance companies are blurred further. The blurring of boundaries amplifies an existing trend to which supervisors and regulators have already reacted by establishing integrated supervisory institutions in many countries and by imposing a regulatory framework for financial conglomerates. Nonetheless, cross-sector contagion risk can increase, and supervisors need to (further) increase their understanding of the interlinkages between banks and insurance companies. However, new risks can pose a special challenge if markets are incomplete and risks cannot be hedged efficiently and effectively. One example that has attracted increasing attention in recent years is longevity risk. Market incompleteness implies nonnegligible risks and costs for banks. On the one hand, due to their right to tax, governments are in a unique position to act as risk bearers of last resort by supporting the issuance of longevity bonds. This enables the government to spread risks in society after they have materialized. On the other hand, government is already exposed to substantial longevity risk, as its expenditure is positively correlated to longevity (i.e. health care and public pensions).
– The increasing reliance on funded pensions (i.e. occupational pension funds) could raise regulatory concerns among supervisors to ensure the protection of pensioners' lifetime savings, which could expose banks to *regulatory risk*. Vooght (2006) draws attention to the consequences for banks: With banks' increasing importance in the provision of pension related products, demands for additional regulations addressing this new role could be voiced. Clark (2004) and Schmitz (2006) show that the current governance structures of occupational pension funds entail risk for the interests of the beneficiaries, both in the trustee system (i.e. the U.K.) and in systems in which occupational pension funds are licensed as credit institutions

and incorporated as joint stock companies (i.e. Austria). Banks hold large stakes in occupational pension funds in Austria, which could expose them to regulatory risk.

– Innovations are concentrated around products and services that generate noninterest income to substitute for declining net interest income. The above-mentioned examples include the provision of advisory services, asset management, annuities and the distribution of near-financial services. The increasing role nonbank financial intermediaries tend to play combined with the continuing role banks play in financial markets (e.g. as market makers or brokers) and as shareholders in nonbank financial intermediaries themselves could lead to an increase in the fee and commission income banks generate from nonbank financial intermediaries (commissions, fees, and dividends). In combination with the downward pressure on interest receivable and payable and decreasing margins, this higher income raises the *share of noninterest income* in bank profit. The financial stability implications thereof depend on the volatility of noninterest income and on the correlation of shocks to noninterest income with the shocks to interest income.

6.3 Country and Political Risk as well as Exchange Rate Risk Will Come under Upward Pressure

International diversification is a common strategic response to aging. It might expose banks to *increased country and political risk and to exchange rate risk*. In addition, many countries that are not affected by aging processes are emerging markets: legal and operational risks might be higher there relative to markets with which banks are more familiar. The implications for bank supervisors are modest, because these risks are not alien to banks or to bank supervisors. Bank risk management models and capital adequacy requirements usually account for such risks. As a consequence, bank supervisors can focus on how well banks handle increased risk within the traditional framework. Nevertheless, exchange rate shocks and country risk are often correlated within regions (i. e. Asian crisis). In addition, supervisory institutions could react to the (further) increase in the emerging market exposure of banks by (further) increasing international coordination and cooperation.

6.4 Mortgage Collateral and Credit Risk Will Come under Upward Pressure

The impact of aging on residential real estate markets will induce banks to change their mortgage policies. Increasing price dispersion and volatility can subject smaller, less diversified mortgage portfolios to increasing *real estate collateral risk* and *higher mortgage loss provisions*. Regional mortgage concentration could be an increasingly important issue for supervisors. Smaller, less diversified mortgage portfolios are subject to increasing real estate collateral risk, calling for more detailed valuation and risk management models that are able to capture these developments. Regional diversification of mortgage portfolios is needed to improve the risk/return tradeoff either by directly entering new regional markets or by investing

in real estate funds with the respective regional focus. Residential real estate price indices are often not sophisticated enough to provide the basis for efficient hedging instruments for regional and local residential real estate price uncertainty. If the market fails to provide adequate indices, public authorities might be called on to help filling the gap.

6.5 The Importance of Cross-Border Branching Will Grow

Banks adopt branch network strategies to ensure geographic proximity to customers, also in response to increasing (temporary) migration of pensioners to traditional holiday destinations. As a consequence, the *role of cross-border branching* might increase, especially in the EU. The current home-host supervisory regime addresses the issue of cross-border branching in principle. Thus potential new developments in this area do not merit immediate supervisory action beyond the call for (further) increased coordination and cooperation.

6.6 Risks Will Stem from the Search for Yields and Increased Risk Tolerance

Banks will try to maintain their strategic relevance for their customers, inter alia by providing higher yields for their customers. This search for yields, in combination with increasing competitive pressure, could encourage banks to *increase their risk appetite*. This might require higher loan loss provisions. However, given the capital adequacy regime in place and the additional incentives for banks to improve their risk management, their corporate governance, and their compliance, given the need for banks to protect their brand, no immediate consequences emerge for supervisors or regulators. However, increased awareness of the potentially higher volatility of capital adequacy ratios would be warranted.

7 Summary

The first main message of the program is that demographic change indeed has an impact on banks and their strategies. The major interlinkages between aging and banks can be summarized along the following lines: The impact of aging on the level and composition of household demand for bank services and products is considered the major channel of transmission. But aging is also expected to have an impact on long-term real interest rates and regional price dispersion and volatility in the residential real estate market.

Banks' strategic responses focus on increasing product innovation, adapting distribution channels, and targeting marketing strategies to the 50+ generation. There is broad agreement about the importance of international diversification. To maintain strategic relevance for their customers, banks might have to offer superior service and/or superior risk/return profiles and to focus on their core competences.

The main financial stability implications are intensified competitive pressure, worsening cost-income ratios, and lower revenues from maturity transformation that might exert downward pressure on bank profitability. These developments reduce the ability of banks to absorb adverse shocks through profits in the respective period. Shocks can hit bank capital adequacy ratios more easily. In addition, the composition of bank profits shifts (further) from interest to noninterest income. New products

can increasingly expose banks (but also households) to operational, reputation, legal and traditional insurance risks (relative to traditional products). International diversification might expose banks to increased country and political risk as well as exchange rate risk.

The immediate implications for supervisors are modest in most cases: The statutory minimum capital adequacy ratio might be reviewed in the light of the increasing reliance on the shock absorption capacity of bank capital. Supervisors might want to promote adequate regulatory frameworks for new products to reduce legal risk for banks. Given the increasing complexity of financial products and the ongoing shift of risks to households, provisions that increase market and price transparency for consumers and ensure adequate consumer protection will be required. Certainly, banks and supervisors should continuously monitor the impact of demographic change on banks and financial stability.

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Stress Testing the Exposure of Austrian Banks in Central and Eastern Europe

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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 well limited.

JEL classification: G15, G21, F23.
Keywords: financial stability, Central and Eastern Europe, stress testing, credit risk.

1 Introduction

Over the course of the last decade, Austrian banks[2] have successfully seized the opportunity to expand their presence in the CEE banking markets. Taking into account that almost 40% of the Austrian banking system's total profits are earned by CEE operations today,[3] the evolution of the CEE banking markets has had a substantial influence on the Austrian banking system. With a market share of almost 24% in CEE,[4] these operations have at the same time considerable influence on the stability of the CEE banking markets. As much as CEE subsidiaries can profit from the stability of their parent banks, they could also be affected by their potential instability. If, for example, some exogenous shock in one particular market puts an Austrian parent bank into trouble, its presence in the region could transfer this shock into other CEE markets as well. Therefore, the issues of Austrian and regional financial stability are closely interlinked.

Based on a stress testing exercise this paper is intended to assess both

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[2] *Throughout this paper, the term "Austrian banks" refers to banks or banking groups operating in Austria, irrespective of domestic or foreign ownership. Therefore e.g. Bank Austria Creditanstalt AG (BA-CA) is included in the analysis.*

[3] *The sample of countries for this paper has been chosen according to the exposure of Austrian banks and their fully consolidated subsidiaries in the region as reported to the OeNB as of December 2006. It includes Albania (AL), Belarus (BY), Bosnia and Herzegovina (BA), Bulgaria (BG), Croatia (HR), the Czech Republic (CZ), Hungary (HU), Poland (PL), Romania (RO), the Russian Federation (RU), Serbia (RS), Slovakia (SK), Slovenia (SI) and Ukraine (UA). The ongoing organizational changes of BA-CA are only included in case they are reflected in the year-end data reported to the OeNB.*

[4] *Excluding the Russian Federation and Turkey, but including the expected market shares after the reorganization of BA-CA; including the Russian and Turkish markets would lead to a market share of 14.5%.*

Refereed by:
Thomas Reininger and
Walter Waschiczek,
OeNB.

the impact of CEE banking operations on Austrian banks and the impact of Austrian financial stability on financial stability in CEE countries. The scenario used in the stress test (i) takes account of the differences in host country risks and (ii) represents a worst case that deliberately exceeds historical shocks.

Section 2 provides a review of the development as well as the status quo of Austrian banks' exposure in the region. Section 3 gives a succinct summary of recent trends in the region's banking systems, while section 4 briefly reviews the rationale behind stress testing in general as well as the stress testing experiences of the CEE central banks and the International Monetary Fund (IMF) in the region in particular. All three sections aim at establishing a proper understanding of economic circumstances as well as the reasons why national and international authorities stress test credit exposures in the CEE region. Section 5 presents the refined methodology and results of stress tests conducted at the Oesterreichische Nationalbank (OeNB) for the Austrian banking system with respect to its credit exposure vis-à-vis the CEE region. Section 6 concludes.

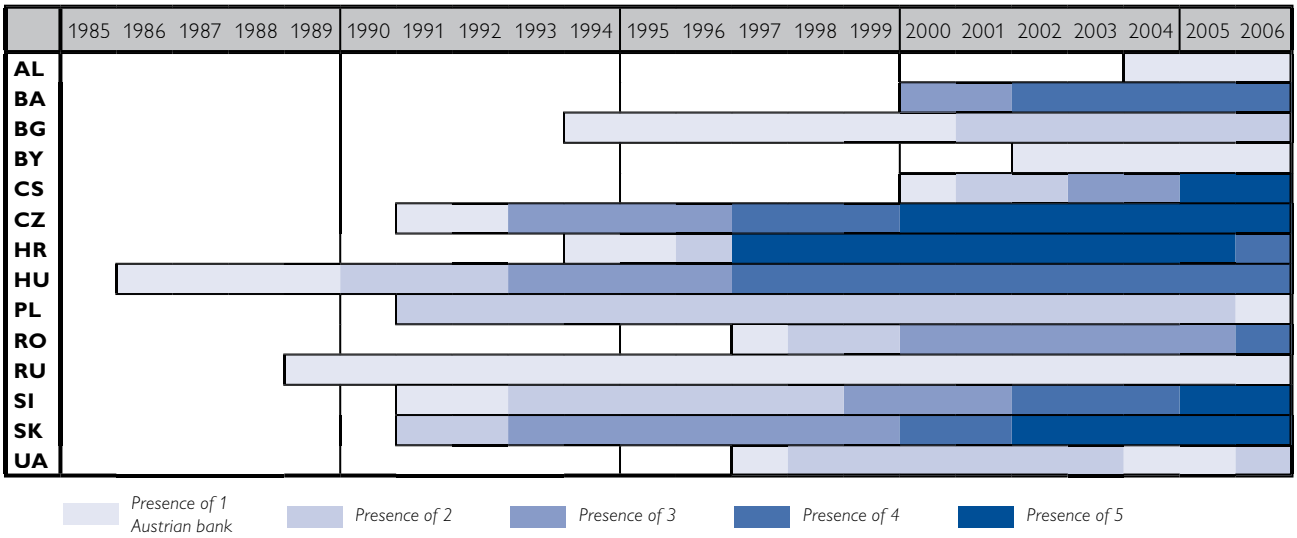
2 Exposure of Austrian Banks in CEE

Austrian banks started to enter the CEE markets as early as in the mid-1980s to provide service to domestic clients (Austrian industrial companies) who expanded to CEE. By the early 1990s three Austrian banking groups (or their predecessors) had established subsidiaries in neighboring countries, but also in Poland and Russia (see chart 1).

During the recessions that struck most CEE countries in the 1990s, Austrian banks and their subsidiaries – contrary to many state-owned banks (SOBs) – steered clear of default, as at that time the subsidiaries were almost exclusively greenfield operations with less risky loan port-

Chart 1

A Timeline of Austrian Banks' Subsidiaries in CEE Countries



Source: OeNB, banks' websites.
Note: The banks included are BA-CA, BAWAG P.S.K., Erste Bank, Hypo Alpe-Adria-Bank International, ÖVAG and RZB.

Table 1

Presence of Austrian Banking Groups in CEE Countries

	AL	BA	BG	BY	CS	CZ	HR	HU	PL	RO	RU	SI	SK	UA
BA-CA		X	X		X	X		X		X		X	X	
BAWAG P.S.K.						X						X	X	
Dexia Kommunalkredit Bank AG													X	
DenizBank AG											X			
Erste Bank					X	X	X	X		X			X	
RZB Oesterreich	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Raiffeisen Bausparkasse GmbH						X	X							
Österreichische Volksbanken-AG		X			X	X	X	X		X		X	X	
Hypo-Bank Burgenland AG								X						
Hypo Alpe-Adria-Bank International AG		X			X		X					X		
Porsche Bank AG								X		X				

Source: OeNB.

Note: The table includes all banks or banking groups operating in Austria, irrespective of domestic or foreign ownership, that have at least one CEE subsidiary.

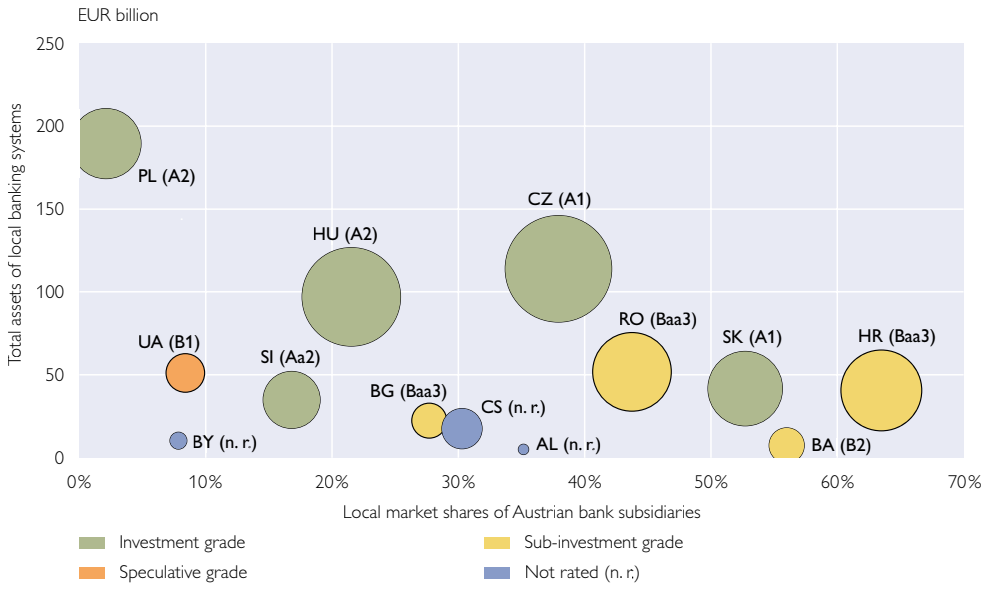
folios than many SOBs that struggled with bad loans inherited from communist times. While the restructuring and refinancing of SOBs proved costly and led many CEE governments to proceed with full or partial privatization, more Austrian banks expanded into CEE in the second half of the 1990s (see Barisitz, 2006). That period was marked by a significant departure from their formerly homogenous business models as their strategies diversified. Some banks sticked to their initial greenfield operations and a strategy of organic growth, whereas others acquired stakes in large SOBs in the first wave of privatization to accelerate their expansion.

At the turn of the millennium, the economic environment in most CEE countries stabilized and banking activities entered a path of sustained expansion, boosted by robust economic growth and the anchor or prospect of EU integration (see Barisitz, 2006). EU-15 banks began to enter the markets in significant numbers, taking advantage of further large-scale privatizations. Apart from the Hungarian OTP Bank and a few large domestically-owned national players or SOBs, the banking markets in CEE were dominated by EU-15 banking groups at that time. As the CEE countries began to prosper and EU membership negotiations started, three Austrian banks (BA-CA, Erste Bank and RZB) in particular had seized the opportunity of an early expansion into the region. They are among the largest foreign investors in terms of control over total banking assets in CEE.

The significance of the CEE countries for the Austrian banking system has increased continuously in parallel to the expansion of Austrian banking groups into the region. In addition to the organic growth of established subsidiaries and to further acquisitions, surging direct loans have contributed to an increasing exposure of Austrian parent institutions to the CEE markets. On a consolidated basis, the CEE business segment reports

Chart 2

Exposure of Austrian Banks in CEE Countries at End-2006



Source: OeNB, national central banks, Moody's.

Note: The x axis represents the market share of Austrian banks' subsidiaries in each country, the y axis represents total assets of each country's banking system and the size of the bubble displays the total exposure of Austrian banks in each country.

of the six major Austrian banks active in the region[5] show a steep absolute increase in total assets and an even steeper increase in pre-tax income.

At end-2006, CEE business accounted for 20.3% of total banking assets in Austria and 38.7% of all pre-tax income.[6] The overall exposure of Austrian banks in the region amounted to EUR 144.3 billion, of which EUR 52.5 billion was attributable to direct lending business and the remainder to indirect lending business via subsidiaries. Disaggregated data on the subsidiaries of the 11 Austrian banking groups active in the region (see table 1) reveals that they hold considerable cumulated market shares in CEE that come to or above 40% in seven countries.[7] A detailed depiction of market sizes and shares is provided in chart 2. For the entire region (excluding Russia and Turkey), Austrian banks' market share reached 23.7%.

Although some markets contribute significantly to Austrian banks' overall exposure to the CEE markets – in terms of subsidiaries' aggregate total assets, the largest exposure is vis-à-vis the Czech Republic, followed by Hungary, Croatia, Romania and Slovakia – it is well diversified with no single country contributing more than 20%. The Herfindahl In-

[5] *BA-CA, Erste Bank der oesterreichischen Sparkassen AG (Erste Bank), Raiffeisen Zentralbank Österreich AG (RZB), Bank für Arbeit und Wirtschaft und Österreichische Postsparkasse AG (BAWAG P.S.K.), Österreichische Volksbanken AG (ÖVAG), Hypo Alpe-Adria-International.*

[6] *Excluding special items due to the sale of subsidiaries.*

[7] *Albania, Bosnia, Croatia, the Czech Republic, Romania, Serbia and Slovakia.*

dex is a means to assess the extent of diversification quantitatively.[8] With respect to Austrian subsidiaries, the Herfindahl Index has decreased substantially over time from 0.17 in 2002 to 0.07 at end-2006. More than one-half of total banking assets of Austrian subsidiaries in the region are held in countries with investment grade ratings.[9]

Given that the prospect of EU membership has been another important stabilization factor for the CEE banking systems, it is interesting to note that the new EU Member States (NMS)[10] account for roughly one-half of the aggregate total assets of the entire CEE banking system. Austrian banks' exposure, however, shows significantly higher concentration there. In terms of total assets of CEE subsidiaries, 74.9% are held in NMS, whereas the current presence in Russia, the largest individual CEE market, is fairly limited. The single most important market outside the NMS for Austrian banks is Croatia.

Although Austrian banks grow more rapidly outside the NMS, their main exposure is likely to remain within the NMS in the near future, as investment in countries like Romania has just recently picked up. As regards CEE subsidiaries' operating profits, the share of NMS amounts to 70.6%. This share is about 4 percentage points lower than the share of NMS in total assets (see above), which points to a higher profitability of subsidiaries outside the NMS.

3 State of the CEE Banking Systems

Over the last years, the performance of banking systems in the CEE region has improved markedly reflecting dynamic economic activity. Banks have recorded a generally positive operating performance, with profitability increasing and efficiency improving.

The evolution of average individual bank ratings underscores a generally positive outlook for the region's banking systems. Out of the ten countries for which Moody's publishes average individual bank ratings, no country rating was downgraded with respect to the average ratings since 2002 (see Moody's, 2002 and 2007). In fact, the ratings of nine countries were upgraded, and the remaining one was a constant average bank financial strength rating. Even more recently (i.e. in the course of 2006), the ratings of only three out of ten banking markets (again based on their average individual bank rating) were downgraded. The assess-

[8] *Herfindahl Indices for each year are computed as*

$$HI = \left[\sum_{i=1}^{N} \left(\frac{X_i}{\sum_{j=1}^{N} X_j} \right)^2 - \frac{1}{N} \right] \Bigg/ \left[1 - \frac{1}{N} \right]$$

where X_1, X_2,..., X_N denote the Austrian subsidiaries' assets in each of N countries. The index takes on values between 0 (representing perfect diversification) and 1 (total concentration, i.e. no diversification).

[9] *Taking into account Moody's bank financial strength (BFS) rating instead of the country ratings, 42.1% of assets are currently held in countries with an average individual bank rating of C (adequate intrinsic financial strength), 42.6% in countries with an average rating of D (modest intrinsic financial strength) and only 15.3% in countries that are not rated at all or show an average rating of E (very modest intrinsic financial strength). As a comparison, Switzerland has an average BFS rating of B, Italy C+ and Germany and Austria C (see Moody's, 2007).*

[10] *This group includes the countries that joined the EU in 2004 plus Bulgaria and Romania.*

ment by Fitch Ratings last autumn noted important improvements in the emerging markets' banking systems, thus underpinning the assessment by Moody's (see Fitch Ratings, 2006).

Over the last years, bank profitability in CEE has been consistently above EU-15 levels and has continued to improve. The asset-weighted return on assets (ROA) of EU-15 banks stood at 0.5% in 2005, whereas the ROA of CEE banks was markedly higher at 1.8%.[11] Furthermore, an upward tendency can be seen with regard to profitability, as the aggregate ROA across the region came to 1.2% in 2003 and to 1.4% in 2004. The standard deviation of banks' ROA has declined as well, indicating a homogeneous trend in this respect.[12]

Banks in the region also managed to raise their cost efficiency, which makes profitability increases more sustainable. A stochastic frontier analysis of banks' cost efficiency in the NMS indicates that CEE banks have increased their cost efficiency quite rapidly from 1999 onward, albeit starting from rather low levels. From 1999 to 2002 the cost efficiency of banks in the NMS augmented by 4.1%, whereas from 2002 to 2005, it increased by only 2.3%.[13] Despite this slowdown, the banks in the NMS seem well on track to shrink the efficiency gap with respect to their EU-15 peers. The evolution in terms of cost efficiency is reflected in the development of cost-to-income ratios (CIRs), which decreased from 75% in 2002 to 63% in 2005. Additionally, the standard deviation of CIRs fell, too, in fact pointing to a homogeneous trend in this respect as well.[14]

Given the current profitability levels, banks in the region have a comfortable first line of defense in the face of potential loan losses before having to tap their capital buffers. Solvency ratios mostly remain in a double-digit range, although they are – not least owing to rapid loan growth – on the decline in most countries (see ECB, 2006).

Loan growth, however, continues to be a concern from the supervisory perspective. The total loan growth of the median bank in the region was 22.4% in 2005,[15] which raised fears that part of this growth comes at the cost of accumulating hidden credit risk (see Hilbers et al., 2005). Lending to private households grew considerably faster over the last years. Given the current level of intermediation depth, growth rates reflect a catching-up process to EU-15 levels (see ECB, 2006, or Backé and Walko, 2006). The speed of this process, however, is challenging for individual banks and for policymakers. A par-

[11] *Source: Bureau van Dijk's BankScope database.*

[12] *For ROA data on individual NMS, see e.g. ECB (2006).*

[13] *For data from 1999 to 2002, see Rossi et al. (2005). Data for the period from 2002 to 2005 are the authors' calculations. All values are based on Stochastic Frontier Analysis (SFA) estimates with a Fourier flexible form for banks' production functions. The countries covered are all NMS for the period from 1999 to 2002 and all NMS plus Croatia for the period from 2002 to 2005.*

[14] *Source: Bureau van Dijk's BankScope database. This tendency is confirmed by ECB data on individual NMS, which shows that with the exception of Poland and Slovakia, CIRs declined in all NMS from 2002 to 2005 (see ECB, 2005, and ECB, 2006).*

[15] *Source: Bureau van Dijk's BankScope database.*

ticular concern in the region is foreign currency lending,[16] which exposes the borrowers (households and corporations) to exchange rate risk, which may materialize in the form of (indirect) credit risk in banks' loan portfolios, and also entails reputation risk for heavily involved banks (see ECB, 2006).[17]

The close monitoring of loan growth has to be considered in conjunction with the currently low levels of loan loss provisions (LLPs) in a number of countries. The fact that loan loss provision ratios are low and/or falling does not come as a surprise in the face of rapid loan growth. Still, loan growth together with a potential rise in the currently low LLPs will certainly challenge the risk management of CEE banks in the medium term. As volumes expand rapidly, lending is likely to move away from prime categories. With the loan portfolio maturing, loan loss provision ratios and nonperforming loan ratios are bound to increase at some point in the future. In the long run, however, the soundness of the banking systems in question will depend on an adequate level of LLPs on the one hand, and on bank efficiency and bank profitability on the other. Current trends indicate that the CEE banking systems in fact have comfortable buffers in their operating results to cope with increasing LLPs. Material changes of LLPs will, however, also have to be taken into account in ICAAP[18] considerations of banks. Stress tests are by all means an important tool for banks in assessing their credit risk in the long run. In this respect, bank risk management has improved in the region, with both the widespread presence of foreign banks and the introduction of Basel II acting as catalysts.

In terms of banking supervision, a considerable portion of the CEE banking market profits from the progress of EU integration and foreign bank ownership. Given the current implementation of several EU directives related to the Basel II framework, the supervisory frameworks in many CEE countries will strengthen further in addition to the progress already made in the course of EU accession. Given the substantial share of foreign bank ownership, the home supervisors of foreign-owned banking groups provide an additional layer of prudential supervision. The ongoing cooperation between home and host supervisors (e.g. by means of supervisory colleges) plays an important role in this respect.

4 Stress Testing in CEE

One way to assess the credit risk inherent in Austrian banks' CEE exposures from a financial stability point of view is the implementation of stress tests to determine how Austrian banks weather shocks in these mar-

[16] *See ECB (2006) and Standard&Poor's (2006) for more details on individual countries. Note that the Czech Republic and Slovakia are an exception to the general boom of foreign currency lending in CEE.*

[17] *See ECB (2006) on the reaction by the central banks and supervisory authorities in some countries to the increasing popularity of foreign currency lending. The final assessment of the risk exposure of an individual country, however, hinges on a number of factors such as the currency regime, the denomination of the loans (CHF or EUR), the economic policy mix of the respective country, individual banks' lending practices as well as the potential presence of natural hedges (e.g. income in the respective foreign currency).*

[18] *ICAAP (Internal Capital Adequacy Assessment Process) refers to a process institutions should have for assessing their overall capital adequacy in relation to their risk profile and a strategy for maintaining their capital levels. ICAAP constitutes one of the four principles within the Supervisory Review Process as set forth by Basel II.*

kets. Generally speaking, stress tests are tools for evaluating the effects that certain scenarios have on the financial condition of individual banks or the whole banking system. Stress scenarios comprise assumptions about the future development of banks' operational environment – especially of the credit, securities and foreign exchange markets – that potentially pose a risk for the credit institutions. In order to estimate the consequences of the initial shock represented by the scenario on other relevant risk factors, (macroeconomic) modeling can be used, which is usually referred to as macro(economic) stress testing or scenario analysis. Alternatively, in a sensitivity analysis only a subset of risk factors is "stressed" and all other risk factors remain at their actual levels. In any case, stress scenarios should describe events that are exceptional but still plausible. Examples for commonly used scenarios are a sharp slowdown in economic growth or a marked shift of the yield curve. Today, stress tests are used as valuable tools at the risk management units of banking institutions as well as at organizations responsible for safeguarding financial stability and for banking supervision (Blaschke et al., 2001).

4.1 Stress Testing by Central Banks in CEE

A growing number of CEE central banks publish the results of their own stress testing exercises in their regular publications on financial stability. Comparability of the results is certainly limited by data availability as well as confidentiality on the one hand, and by differences in individual methodologies of stress tests on the other. While the remainder of this section covers information on stress testing by central banks (with a special focus on credit risk) that was published in financial stability reports and similar publications, section 4.2 gives an overview on stress tests that were developed in the course of the FSAPs[19] of the countries under consideration.

While Albania, Bulgaria and Croatia do not yet publish the results of their stress tests in their financial stability publications, they regularly conduct sensitivity analyses for banks' loan portfolios. Bâlgarska Narodna Banka (BNB) bases its credit risk assessments on the FSAP exercise considering the historical experience of the BNB regarding the migration of loans from low to high risk categories. Hrvatska narodna banka (HNB) uses a historical worst-case scenario based on the experience made during the crisis of 1998 and 1999. In addition, it is currently developing macro stress tests for credit risk.[20]

In contrast, Belarus, Poland and Slovakia publish the results of sensitivity analyses in biannual or annual reports. The National Bank of the Republic of Belarus (NBRB) presents the results of two credit risk scenarios in its report on the development of the banking system (see NBRB, 2006). The first scenario assumes an increase in the share of problem assets, i.e. in the ratio of nonperforming loans to total loans, by 15 percentage points, while in the second scenario loans are shifted from lower to higher risk categories. In its most recent financial stability review (see

[19] *Financial Sector Assessment Program of the IMF.*

[20] *Information about the internal stress tests was provided by the respective central banks on an informal basis.*

NBP, 2006), Narodowy Bank Polski featured four simulations for assessing credit risk. The first simulation determines the percentage of loans extended by domestic commercial banks with a satisfactory rating that would have to be downgraded to doubtful so that the capital adequacy ratio (CAR) would fall to 8%. The second simulation measures the impact of a decrease of loan collateral on the CAR of the ten largest banks in Poland. The third and the fourth simulations were designed to assess the effect of bankruptcy of the three largest borrowers from the non-financial, respectively the financial sector, on financial stability. Additionally, interbank contagion risk is addressed in the Polish financial stability report and an econometric macro-model for stress testing is currently being evaluated internally. Národná banka Slovenska (NBS) has recently published research on two credit risk scenarios (see Jurca and Rychtárik, 2006, and NBS, 2006). The first scenario, a credit crunch, simulates a deterioration in the financial position of banks' clients, while the second scenario was derived from the increasing competitive pressure related to the relatively high pace of loan growth. It therefore simulated a situation in which banks striving to increase their market share extend a larger number of loans and also increase the share of loans provided to less solvent clients.

The central banks of Romania and Russia both publish results based on macro stress tests; while the Banca Naţională a României (BNR) publishes the results in its annual financial stability report (see BNR, 2006), the Central Bank of the Russian Federation (CBR) does so in its annual banking supervision report (see CBR, 2006). In its latest report the BNR presents a credit risk stress test that takes into account second-round effects of a depreciation of the domestic currency and of interest rate movements for domestic currency lending. This macro stress test was designed on the basis of an approach developed by the Banque de France (see De Bandt and Oung, 2004). The CBR reports results of macro stress tests with respect to two different scenarios without providing details regarding the underlying methodologies.

The Czech Republic and Slovenia conduct both sensitivity analyses and macro stress tests. Banka Slovenije publishes stress test results in its annual financial stability report (see Banka Slovenije, 2005), the latest issue of which also contains a special feature on macro stress testing for the Slovenian banking system (see Kavčič et al. 2005). As the title suggests, it focuses on macro stress testing, but regarding credit risk an individual stress test is calculated within the so-called "piecewise approach." Ceská národní banka (CNB) publishes stress test results in its annual financial stability report (see CNB, 2006) and has a history of publishing such results.[21] Sensitivity stress tests are calculated for two scenarios, which assume an increase in the NPLR by 30% and 3 percentage points, respectively. In addition, various more sophisticated stress tests are calculated. These include macro stress tests using consistent model scenarios and stress test for interbank contagion, as well as combinations of these two types of stress tests.

[21] *For two recent examples see Cihák et al. (2007) or Jakubík (2007).*

Finally, Magyar Nemzeti Bank (MNB) published an article on stress testing including the methodology used and the results as early as 2001 in their report on financial stability (see MNB, 2001). Since then, the MNB has addressed stress tests for credit and also contagion risk in the interbank market in various issues of its financial stability report. The latest issue for the year 2006 includes stress tests on credit risk for the household and the corporate sector.

4.2 Stress Tests Performed under the FSAPs of the IMF

As can be seen from the previous section, the comparability of the stress testing scenarios used in the CEE countries is limited, given the differences in the methodologies used and in the level of quantitative information available for the individual countries. However, in many cases the supervisory interest in stress tests was initially spurred in the course of an FSAP by the IMF. While FSAP stress tests can also differ quite substantially with respect to the underlying methodologies, they generally provide at least some degree of comparability.

Stress tests form an integral part of an FSAP exercise and, according to the IMF, have been performed for every IMF member (see Hilbers et al., 2004). Data availability is a key factor in determining the approach and sophistication of the stress tests. For this reason and owing to the short time frame available during FSAP missions, FSAP stress tests are predominantly sensitivity analyses for a single risk factor or a group of risk factors[22] performed on a bank-by-bank basis. However, some FSAP participants have used macro models or included contagion risk and second-round effects into the exercise (see Hilbers et al., 2004).

Table 2 provides an overview of credit risk stress tests that have been performed by the IMF in the course of the FSAPs of the CEE countries under consideration. In some cases, these stress tests were recalculated during a subsequent Article IV Consultation. They often served as a starting point for the development of stress tests by the various national authorities, which were discussed in the previous section. In this table, we tried to achieve some degree of comparability of the credit risk stress tests performed in the various CEE countries. In general, all scenarios are based on the assumption that loan quality deteriorates through a downward shift in the classification of the loan portfolio. This classification contains the categories "standard" and "watch" (performing loans – Ps) and the categories "substandard," "doubtful" and "loss" (nonperforming loans – NPs). Given the respective country's provisioning scheme,[23] it is possible to calculate the loss associated with the scenario and its impact on the capital adequacy ratio.

However, the scenario definitions vary with respect to the precise characterization of the downward shift in the classification of the loan portfolio. While in some cases the migration of loans between categories is

[22] *The stress levels of individual risk factors are often based on historical scenarios.*

[23] *The provisioning scheme specifies the percentage of loan loss provisions that banks have to make for the absolute amount of loans within each category according to the regulations in the respective country. For example, the provisioning scheme could require 2% for loans classified as "standard," 5% for "mentioned," 30% for "substandard," 50% for "doubtful" and 100% for "loss."*

Table 2

Credit Risk Stress Tests in CEE Countries Presented in the IMF's FSAPs

	Description of Credit Risk Scenario according to FSAP[1]	Increase in NPLR[2]	IMF Country Report	Date
AL	10% deterioration in standard loans	9.5 pp[3]	No. 05/274	08/2005
BA	n.a.	n.a.	No. 06/371	10/2006
BG	All doubtful loans become loss loans, 50% of substandard loans become doubtful loans, 5% of "watch" loans become substandard loans and 1% of standard loans become "watch" loans.	n.a.	No. 02/188	08/2002
BY	Downward shift in classified loans by one category. 20% of standard loans are assumed to become substandard loans.	n.a.[4]	No. 05/216	06/2005
CS	The ratio of nonperforming loans to loans rises by 6.2 percentage points.	6.2 pp	No. 06/96	03/2006
CZ	62% increase in nonperforming loans	62%[5]	No. 01/113	07/2001
HR	Moving risk-weighted performing assets to nonperforming status	n.a.	No. 02/180	08/2002
HU	Increase in NPLs by 100%	100%	No. 05/212	2005
PL	Increase of 2.5% in the ratio of classified loans	2.5 pp[6]	No. 01/67[7]	06/2001
RO	10% of loans become NPLs and provisioning for new NPLs comes to 50%	10 pp	No. 03/389	12/2003
RU	Increase in the NPL ratio by the peak value observed for each bank in the period from 1998 to 1999	10.8 pp[8]	No. 03/147	05/2003
SI	Deterioration of loan quality using a credit migration matrix	n.a.	No. 01/161	09/2001
SK	Credit risk shock with a 65% increase in NPLs	65%	No. 02/198	09/2002
UA	All doubtful loans become loss loans, 20% of substandard loans are downgraded to doubtful, 10% of "watch" become substandard, 10% of standard loans are downgraded to "watch" loans and standard loans increase by 10%	n.a.	No. 03/240	11/2003

Source: Compiled by the OeNB on the basis of IMF's FSAP country reports and of other sources specified in the note.

Note: n. a. = not available

[1] *The description of the credit risk scenario was taken from the respective FSAP country report. In cases where more than one stress test was calculated, we present only the test that can be expressed in terms of an increase of the nonperforming loan ratio (NPLR). If no such stress test was calculated at all, we chose the scenario with the largest impact on the financial system.*

[2] *Relative or absolute increases in the NPLR in % or percentage points (pp), as indicated in the scenario description.*

[3] *Assuming an initial NPLR of 4.5% (which corresponds roughly to the average NPLR between the first quarter of 2004 and the first quarter of 2005) and a shift of 10% of loans classified as standard to nonperforming categories.*

[4] *In the NBRB's most recent report on the development of the banking system (NBRB, 2006) an increase of the NPLR by 15 percentage points is assumed.*

[5] *In Article IV, IMF Country Report No. 05/276 an increase of the NPLR by 30% and 3 percentage points, respectively, is assumed.*

[6] *The scenario description was interpreted as an increase of the NPLR by 2.5 percentage points.*

[7] *In spring 2006 Poland underwent an FSAP update. However, the respective results were not published before the editorial close of this publication and hence are not included here.*

[8] *Calculated as the change in NPLRs between end-1998 and 1999 for the aggregated banking system.*

specified for each category separately, in others an increase in NPLs or the respective ratio to total loans (NPLR) is specified implicitly or explicitly through the definition of the scenario. In the latter case, an additional assumption has to be made regarding the amount of loan loss provisions associated with the increase in NPLs. One approach is to assume that the relative share of NPL categories remains constant before and after the shock. Given the respective provisioning scheme, it is possible to calculate the loss associated with the increase of NPLs. Another approach is to simply assume that an increase in NPLs by a certain amount x leads on average to a fixed percentage increase in loan loss provisions, e.g. 50% of x.

In order to achieve maximum comparability between the different approaches, we try to translate each scenario into an absolute or relative increase in the NPLR. However, given the lack of data regarding the distribution of the loan portfolio over categories, this is not possible in cases where the migration of loans between categories is specified for each category separately. In addition, for some scenarios we had to make additional

assumptions (see notes to table 2) in order to interpret the described scenario in terms of an increase in the NPLR. In cases where more than one stress test was performed for a specific country, we present the test that can be expressed in terms of an increase of the NPLR. If more than one such stress test was available, we chose the scenario with the largest impact (see table 2). As can be seen from the table, the scenarios vary quite substantially across countries in terms of the increases in the NPLR, which range from 2.5 to 10.8 percentage points in absolute terms and from 62% to 100% in relative terms.

Despite the aforementioned problems, stress tests conducted by the IMF in the course of FSAP and Article IV missions (see table 2) as well as those of the national central banks[24] provide a valuable starting point for creating severe but still plausible scenarios for the purpose of stress testing Austrian banks' exposure in the region. Hence they serve as a benchmark for the definition of scenarios of the OeNB's stress test that is presented in the following section.

5 The OeNB's CEE Stress Test

By introducing a scenario that exposes the Austrian banking system to a both severe and plausible shock we want to answer two closely interconnected questions: On the one hand, we try to find out whether the current CEE exposure puts domestic financial stability at risk and, on the other hand, whether the impact of a shock on the capital buffers of Austrian banks active in the region threatens or supports financial stability of the CEE markets. If Austrian parent banks e.g. had capitalization problems as a consequence of an exogenous shock in one particular market, they could transfer these shocks to other CEE markets as well, given their importance in the region.

5.1 Scenario

The OeNB developed a first stress test for the CEE exposure of Austrian banks as early as 2003 which consists of two scenarios that were originally drafted during the IMF's FSAP mission to Austria in 2003. The first scenario involved a cyclical shock entailing a rise of LLP ratios of Austrian banks' subsidiaries by the historical maximum relative year-on-year changes in the overall ratio of each country's national banking sector. The second scenario was one of structural change that assumed that the LLP ratios of Austrian banks' subsidiaries in CEE rise to the current overall ratio of each country's national banking sector (see Boss et al., 2004).[25] In subsequent regular stress testing exercises based on these two scenarios, an increase of LLP ratios for the whole region of 40% was assumed (see OeNB, 2006, for a summary of results over time).

Since then, the nature of the Austrian banks' exposure to the CEE markets has changed significantly. Not only has the size of the exposure increased, but also the number and importance of individual countries has changed (see also chart 1). Today the exposure of Austrian banks is spread across a larger number of countries in different stages of eco-

[24] *Though to a lesser extent for reasons of the highlighted comparability problems.*

[25] *Like in the stress test presented in this contribution, direct cross-border lending was "stressed" in the course of the FSAP, too.*

nomic development and financial deepening. This latter aspect is, inter alia, reflected in the diversity of shocks applied in the individual countries' FSAP stress tests. Furthermore, the rapidly expanding loan volume in numerous CEE countries has raised questions whether the shocks imposed by our former stress tests were sufficiently severe to cover extreme events. These circumstances made it necessary to adapt the stress testing scenarios presented in this contribution.

The scenario of our stress test is built on "shocking" nonperforming loans in the CEE banking markets. The size of the shocks is based on the experience we can draw from both the stress tests conducted by the IMF and the national authorities (see section 4). As a rule, we aim at introducing shocks that are on average as severe as the ones in the aforementioned stress tests.[26]

In order to produce severe but still plausible shocks, it has to be considered that historical fluctuations in nonperforming loans or loan loss provisions may underestimate the true risk exposure in a stress situation.[27] This insight led us to develop a shock that deliberately surpasses the historical maximum increases in some countries.

Furthermore, as already mentioned in section 3, the current levels of LLPs and bad debt are very low in a number of countries, not least due to the rapid loan growth witnessed across the region. The scenario therefore assumes a shock that is the maximum of a relative and absolute increase in the NPL ratios, thus preventing the shock from being small only because of the currently low levels of NPLs.

Our new scenario takes into account the diversity of individual countries and proxies the different stages of economic and financial development by the state of integration into the EU. Although this proxy appears to be crude at a first glance, we believe it best reflects the institutional and regulatory advances made in individual countries. Even more importantly, this hypothesis is confirmed by data from e.g. the European Bank for Reconstruction and Development (EBRD) or commercial rating agencies like Moody's (see table 3).

The countries are thus grouped in accordance with their state of integration into the EU as a risk measure, which is adapted case by case owing to idiosyncrasies of some countries. For this stress test we divide the countries into three risk categories. Category 1 includes all countries that joined the EU in 2004 with the exception of Hungary, which is included in category 2, given the recent political and economic tensions. This decision is supported by Hungary's Macro Prudential Risk Indicator of 4 (see table 3) and more recent reports on Hungary's persistent fiscal difficulties, the increased volatility of the Hungarian forint and the ensuing

[26] *A few individual shocks are more severe than the ones we introduced in our scenario, which is attributable to the fact that we impose equal size shocks on groups of countries. Individual countries may therefore be exposed to larger shocks in the stress tests conducted by the IMF or the national central banks. Furthermore, the comparability of scenarios is sometimes difficult, if not impossible, owing to data limitations.*

[27] *Given the wide-ranging economic and political transformation process in CEE countries, past banking crises cannot be considered viable examples of potential future crisis situations. Furthermore, the characteristics of the ongoing process of rapid financial deepening have to be taken into account to determine the size of the shock. We therefore refrain from using a historical worst-case scenario.*

Table 3

Financial Strength Indicators for CEE Countries

	EU membership status	Indicators from the EBRD Transition Report			Moody's Bank and Sovereign Credit Comments 02/2007		
		Transition[1,2]	Macro prudential[3,4]	# Systemic risks[3]	Sovereign Rating	Avg LT Deposit[5]	Avg BFS Rating[6]
CZ	member country since 2004	4	1	0	A1	A2	C–
HU	- " -	4	4	1	A2	A2	C–
PL	- " -	3,67	1	2	A2	A3	D+
SI	- " -	3,33	1	3	Aa2	A2	C–
SK	- " -	3,67	1	0	A1	A2	D
BG	member country since 2007	3,67	3	2	Baa3	Ba2	D–
RO	- " -	3	3	2	Baa3	Ba1	D–
HR	accession country	4	1	1	Baa3	n.a.	D+
AL	no status	2,67	2	4	n.a.	n.a.	n.a.
BA	- " -	2,67	2	2	B2	n.a.	n.a.
BY	- " -	1,67	2	7	n.a.	n.a.	n.a.
CS	- " -	2,67	2	4	n.a.	n.a.	n.a.
RU	- " -	2,67 (+)	2	6	Baa2	Ba2	E+
UA	- " -	3 (+)	3	5	B1	B2	E+

Source: OeNB, EBRD, Moody's.

[1] *Data from the 2006 report.*
[2] *Ranging from 1 to 4, with 4 being the most favorable assessment.*
[3] *Data from the 2005 report; this indicator is no longer published by the EBRD.*
[4] *Risk assessment in a range from 1 to 4, with 4 indicating the highest risk.*
[5] *Average Long-Term Deposit Rating.*
[6] *Average Bank Financial Strength Rating.*
Note: n. a. = not available.

threat of declining investor confidence documented e.g. in the EBRD's Transition Report (EBRD, 2006) or the IMF's Global Financial Stability Report (IMF, 2006). Category 2 includes Bulgaria and Romania as well as the only remaining accession country, Croatia, while category 3 consists of all other CEE countries. For countries in category 1, we chose an increase in the NPL ratio by a maximum of 6 percentage points in absolute terms and by 50% in relative terms. For category 2 countries, the respective numbers are 8 percentage points and 75%, and for category 3 countries, it is 10 percentage points and 100%.

The resulting scenario – applied on a single bank basis – constitutes a severe shock to Austrian banks' subsidiaries in CEE countries, as a doubling or even tripling of the aggregate NPL ratios can be observed in a number of countries (see table 4). The results indicate that on average, the absolute change of the NPL ratio (+6 percentage points, +8 percentage points and +10 percentage points, respectively) in the scenario clearly dominates the relative increase (+50%, +75%, +100%, respectively). It should be noted, however, that for some individual subsidiaries, the relative increases are more severe than the absolute ones.

5.2 Methodology

Broadly speaking, we apply the stress test to all nonbank lending exposures to the CEE countries using the scenario described above.[28] More specifi-

[28] *Intra-group exposures to nonbank corporates are not excluded from the stress test.*

Table 4

CEE Stress Test Scenario

	Change of NPL ratios in scenario		Resulting relative change in aggregate NPLs of Austrian subsidiaries
	absolute (percentage points)	relative (%)	
AL			x 4 or more
BA			x 2 – 3
BY			x 2 – 3
CS			x 2 – 3
RU			x 2 – 3
UA	10	100	x 2 – 3
BG			x 2 – 3
HR			x 2 – 3
HU			x 3 – 4
RO	8	75	x 2 – 3
CZ			x 2 – 3
PL			x 1 – 2
SI			x 2 – 3
SK	6	50	x 2 – 3

Source: OeNB.

cally, these exposures include unsecuritized as well as securitized lending that was granted either indirectly by an Austrian parent institution's CEE subsidiary or directly as a cross-border loan by an Austrian bank to a debtor domiciled in the CEE region.[29] Consequently, a bank's loss implied by the stress scenario consists of two components: the loss resulting from indirect lending undertaken by subsidiaries in CEE countries ($L_{indirect}$) and the loss resulting from direct cross-border lending to CEE countries (L_{direct}). The shock is applied to consolidated data, as the focus is on the group level.

For each bank, the indirect loss $L_{indirect}$ is calculated by assuming that an increase in NPLs by 100 units increases LLPs by 50 units.[30] Given the lack of data on the exact distribution of the loan portfolio across different categories, we cannot calculate the additionally required LLPs for the shares of the substandard, doubtful and loss loan categories in total NPLs together with the respective provisioning scheme. Our approximation for the additional LLPs required is based on the assumption that an increase of NPLs by an amount x requires additional LLPs in the amount of 50% of x on average.[31]

[29] *Data on indirect lending were obtained from the supervisory reports on foreign subsidiaries which provide a compressed version of balance sheet and income statements of foreign banks representing an affiliated company of an Austrian parent institution. For a list of Austrian banks with fully consolidated subsidiaries in CEE, see table 1. Data on direct lending were obtained from the OeNB's Major Loans Register. As this register contains only exposures above a reporting threshold per bank and borrower of EUR 350,000, not all direct exposures are included. However, since larger volumes tend to dominate in cross-border lending, we may assume that the bulk of direct exposures is covered. Given the restricted data availability, credit exposures arising from off-balance sheet items (both for direct and indirect lending) are not included in the data.*

[30] *An increase in the NPL ratio by 6 percentage points corresponds to an increase of 3 percentage points in the LLP ratio. Relative changes are, however, unaltered.*

[31] *This approximation is also used by the IMF in some cases (e.g. Romania) for FSAP stress testing (see table 2).*

From the supervisory reports we have data on every subsidiary's LLP ratio for nonbank lending.[32] These ratios are increased in a country-specific way in accordance with the stress scenario described above. The resulting additional LLPs are weighted by the respective parent institution's share in the subsidiary. The sum of weighted additional LLPs across all CEE subsidiaries gives the indirect loss for the parent institution (for banks without CEE subsidiaries, the indirect loss is zero).

The direct loss L_{direct} incurred by a bank in the stress scenario is calculated as follows: The bank's exposures and the associated LLPs reported in the Austrian Major Loans Register are aggregated per country. The resulting LLP ratios are increased country-wise in accordance with the stress scenario. The implied additional LLPs are added up across all CEE countries, giving the direct loss of the bank.[33]

In order to relate the loss implied by the stress scenario to the risk-bearing capacity of a bank, we calculate a capital adequacy ratio (CAR_{stress}) for the scenario by reducing a bank's regulatory capital (RC)[34] by the implied loss:[35]

$$CAR_{stress} = \frac{RC - L_{indirect} - L_{direct}}{RWA} \quad .$$

The stress test is conducted for every single credit institution. Due to confidentiality reasons, the results are published only on an aggregated basis – for the overall banking system (all banks) as well as for a sample of the six major Austrian banks most active in the region (see section 2) that represent 65% of consolidated total assets of the Austrian banking system. This sample covers 98% of all Austrian CEE subsidiaries in terms of total assets. We aggregated the data by simply adding losses, regulatory capital and risk-weighted assets across all banks included in the respective sample and subsequently calculating the capital adequacy ratio for the actual situation and for the stress scenario.

5.3 Results

The outcome of the stress test indicates that the Austrian banking system copes well with an adverse shock to the CEE region. Table 5 shows aggregate results for both the banking system and the sample of six major banks for year-end 2004 through 2006. For both aggregates the reduc-

[32] *As only aggregated LLP data are available (for overall lending of a subsidiary to banks and nonbanks), we have to make assumptions about the proportion of LLPs allocated to nonbank lending. We assume that the bulk of LLPs is allocated to nonbank lending; more precisely, the proportion of LLPs allocated to nonbank lending is 9 to 1 in our scenario. The sensitivity of results to this assumption is very small.*

[33] *This is done on a bank-by-bank basis in a first step. For group consolidation, direct losses of an Austrian subsidiary are assigned to the group's parent without weighting (i.e. with 100%) in a second step. This second step has an effect only on the result of the sample of the six major players (see below), but not on the overall banking system.*

[34] *Defined as eligible tier 1 and tier 2 capital.*

[35] *The risk-weighted assets (RWA) in the denominator include off-balance sheet items. Note that the loss implied by our scenario would in principle also lead to a reduction of RWA. The size of this reduction is, however, unclear as it depends on the risk weights associated with the assets that are impaired. These may differ by country e.g. owing to a different treatment of nonbank financial intermediaries with respect to risk weighting. Therefore we chose to remain on the safe side and not deduct any loss from the RWA. This of course leads to a more severe reduction in CARs.*

Table 5

CEE Stress Test Results

		Total assets (EUR billion)	Actual capital ratio (%)	Stressed capital ratio (%)	CAR change in scenario (percentage points)	Share of indirect loss (%)
All banks	end-2004	733	12.15	11.36	0.79	59
	mid-2005	789	12.35	11.55	0.81	56
	end-2005	848	11.69	10.79	0.89	59
	mid-2006	874	12.37	11.44	0.92	58
	end-2006	918	11.61	10.66	0.95	60
Sample - 6 banks	end-2004	452	11.01	9.86	1.16	65
	mid-2005	490	11.08	9.95	1.13	64
	end-2005	542	10.22	8.98	1.25	65
	mid-2006	569	11.08	9.82	1.25	64
	end-2006	600	10.07	8.80	1.27	66

Source: OeNB.

Note: The share of indirect loss represents the share of indirect losses through subsidiaries' lending in the overall losses implied by the scenario.

tion in the CAR is in the range of 1 percentage point, leaving "stressed" ratios above 8% in both cases, although particularly the ratio of one banking group operating close to the 8%-threshold falls well below the mandatory capital adequacy ratio. At year-end 2006, the individual decline in the CAR for the six banks most active in CEE ranges from 0.34 percentage point to 2.14 percentage points.

It has to be noted however, that reported year-end CARs are biased downward, as they do not yet include plowed back earnings from the previous years, the reason being that regulatory reporting requires CARs to be reported at a time when audited profit data is not yet available (i.e. at the end of January).[36] Profits from CEE operations, however, constitute a significant first line of defense against potential loan losses. In 2006, for example, the profits from CEE subsidiaries alone would suffice to absorb one-half of the indirect lending loss resulting from our stress scenario.[37] Taking into account all profits from the CEE business segment of the six Austrian banks most active in CEE,[38] almost 70% of the shock for these banks is absorbed. Looking at the entire banking system, its 2006 earnings would cover the loss in the stress scenario 1.7 times.

From table 5 it becomes even more evident than by judging from the banks' exposure that lending through CEE subsidiaries is much more important than direct cross-border lending: For the entire banking system indirect losses account for 60.2% of total losses. The sample of

[36] *See also table 5, which reveals a pattern of lower CARs at year-end and relatively higher CARs at mid-year. This pattern is inter alia attributable to the consideration of retained profits in CARs at mid-year.*

[37] *Just as with losses, also subsidiaries' profits are weighted by the share held by the parent institution.*

[38] *Earnings before taxes not considering earnings from the sale of CEE subsidiaries, which would distort earnings upward.*

six major Austrian CEE players unsurprisingly accounts for almost all indirect losses (98%) and still for 74.7% of direct losses. Nevertheless, the stress test reveals a loss potential of EUR 452 million through direct lending that is distributed across several smaller institutions.

The temporal development of stress test results reflects different events and tendencies that have taken place over the past two years. To begin with, unstressed CARs are declining slightly, mirroring the rapid growth in total assets held in the CEE region. This development is even more evident for the subsample of the six banks most active in the region. The growing importance of the CEE business segment for the Austrian banking system is also reflected in the steadily increasing impact of the stress test scenario on CARs (measured in percentage points). Whereas the impact was 79 basis points in 2004, it went up to 95 basis points in 2006.[39] The share of direct vs. indirect lending loss, however, remains by and large constant over time.

It has to be noted that the employed scenario represents a worst case insofar as the shock is applied to all CEE countries simultaneously. Still, given the possibility of a shock affecting the entire region, this might be a severe but realistic setting. Another scenario consists in assuming that the shock is idiosyncratic to one country or occurs only within a limited geographical region and does not spread to other countries. This is of special relevance for evaluating, from a single bank perspective, whether an adverse shock in one country could spread to other countries by way of a solvency problem at the parent bank. We therefore test each of the six major Austrian banks, hypothesizing that our scenario only occurs in that country where it implies the largest loss for the respective bank. In general, the Herfindahl Indices of the six banks are quite low, ranging from 0.04 to 0.31, which points to a high degree of diversification of exposures across CEE countries in most cases. Therefore it comes as no surprise that Austrian banks cope well with this "single country" scenario. The decline in CAR ranges from 0.12 percentage point to 1.09 percentage points, with only the aforementioned bank (which operates close to the minimum regulatory capital requirements) falling below the 8% CAR limit. The results remain much the same if we subject – on a bank-per-bank basis – a set of three countries with the largest loss contribution to our stress scenario, replicating a locally limited crisis. In this case the CARs of the six major banks stay above 8%, of course with the exception mentioned initially. The decline of individual CARs ranges from 0.29 percentage point to 1.80 percentage points.

6 Conclusions

Austrian banks were among the first and largest investors in the CEE financial sector. Given the ensuing importance of the region for the Austrian banking system, Austrian banks benefit from the advantages of a rapidly growing and highly profitable market. The flipside, however, is a

[39] *The only decrease with respect to the impact of the stress scenario happened for the subsample of the six banks most active in CEE. It is ascribable to the listing of Raiffeisen International on the Vienna Stock Exchange. As losses are weigthed by the share that an Austrian mother institution holds in its susidiary, this listing reduced the ultimate exposure of the Austrian banking system accordingly.*

potentially highly correlated risk exposure vis-à-vis a number of CEE countries, which raises two important questions: How strong is the impact of CEE countries for Austrian financial stability and to what extent do Austrian banks contribute to regional financial stability in CEE by prudent lending practices? We conducted a stress test which assumes a perfect correlation between the respective countries and raises NPLs by a maximum of absolute and relative changes that considerably surpass historical fluctuations. The results show that, despite the dramatic worsening of the economic environment implied by the scenario, the Austrian banking system on an aggregate level is not at risk as a result of the hypothesized crisis. With the exception of one bank operating close to the minimum regulatory capital requirements, Austrian banks will in all likelihood be able to absorb shocks in individual countries without transferring them to other countries, independent of whether the shock is idiosyncratic to one country or correlated among several countries. From a bank-by-bank perspective, the stress testing exercise shows that the CEE exposure is manageable, indicating that the effect of a shock on the capital adequacy of Austrian banks will not endanger financial stability in CEE. The six banks most active in the CEE region are, however, called for to consider their rapidly expanding lending exposure in CEE in the planning of their own funds strategy. Moreover, the results show that the major part of total loss is in the form of indirect lending, i.e. comes from bank subsidiaries. The importance of direct lending must not be neglected, though. For the entire banking system it amounts to 39.8% of total loss. Although the six largest banks present in the region account for 74.6% of the direct lending exposure, those banks not present via subsidiaries in fact also have a non-negligible CEE exposure via direct cross-border lending.

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Annex of Tables

Annex of Tables

Cutoff date for data: May 14, 2007

Conventions used in the tables:
x = No data can be indicated for technical reasons
.. = Data not available at the reporting date

Revisions of data published in earlier volumes are not indicated.
Discrepancies may arise from rounding.

International Environment

Table A1

Exchange Rates

Period average (per EUR 1)

	2003	2004	2005	2006	2003	2004	2005	2006
	Year				2nd half			
U.S. dollar	1.13	1.24	1.24	1.26	1.16	1.26	1.20	1.28
Japanese yen	130.96	134.40	136.86	146.06	130.85	135.75	137.51	149.97
Pound sterling	0.69	0.68	0.68	0.68	0.70	0.68	0.68	0.68
Swiss franc	1.52	1.54	1.55	1.57	1.55	1.53	1.55	1.58
Czech koruna	31.84	31.90	29.78	28.34	32.13	31.36	29.50	28.19
Hungarian forint	253.51	251.73	248.04	264.26	259.74	247.37	248.71	267.83
Polish zloty	4.40	4.53	4.02	3.90	4.52	4.33	3.97	3.90
Slovak koruna	41.49	40.03	38.59	37.23	41.47	39.74	38.58	36.89
Slovenian tolar	233.82	239.07	239.57	239.60	235.51	239.89	239.50	239.63

Source: Thomson Financial.

Table A2

Key Interest Rates

End of period, %

	2003		2004		2005		2006	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Euro area	2.00	2.00	2.00	2.00	2.00	2.25	2.75	3.50
U.S.A.	1.25	0.75	1.25	2.00	3.25	4.25	5.25	5.25
Japan	0.001	0.001	0.002	0.002	0.001	0.004	0.027	0.275
United Kingdom	3.75	3.75	4.50	4.75	4.75	4.50	4.50	5.00
Switzerland[1]	0.00–0.75	0.00–0.75	0.00–1.00	0.25–1.25	0.25–1.25	0.50–1.50	1.00–2.00	1.50–2.50
Czech Republic	2.25	2.00	2.25	2.50	1.75	2.00	2.00	2.50
Hungary	9.50	12.50	11.50	9.50	7.00	6.00	6.25	8.00
Poland	5.25	5.25	5.25	6.50	5.00	4.50	4.00	4.00
Slovak Republic	6.50	6.00	4.50	4.00	3.00	3.00	4.00	4.75
Slovenia[2]	6.50	6.00	4.00	4.00	4.00	4.00	3.25	3.50

Source: Eurostat, Thomson Financial, national sources.

[1] *SNB target range for three-month LIBOR.*

[2] *Until January 2003: official interest rate; since February 2003: interest rate for 60-day tolar bills issued by Banka Slovenije.*

Table A3

Short-Term Interest Rates

Three-month rates, period average, %

	2003	2004	2005	2006	2003	2004	2005	2006
	Year				2nd half			
Euro area	2.33	2.11	2.19	3.08	2.14	2.14	2.24	3.41
U.S.A.	1.22	1.62	3.57	5.19	1.15	2.03	4.06	5.40
Japan	0.09	0.09	0.09	0.31	0.09	0.09	0.09	0.46
United Kingdom	3.69	4.59	4.70	4.80	3.70	4.85	4.56	5.02
Switzerland	0.33	0.47	0.80	1.51	0.26	0.65	0.84	1.78
Czech Republic	2.28	2.36	2.01	2.30	2.10	2.60	1.95	2.50
Hungary	8.49	11.29	7.02	6.99	10.38	10.62	6.18	7.74
Poland	5.68	6.20	5.29	4.21	5.40	6.75	4.61	4.20
Slovak Republic	6.18	4.68	2.93	4.32	6.17	4.05	3.02	4.93
Slovenia	6.78	4.66	4.03	3.58	6.36	4.05	4.02	3.54

Source: Thomson Financial.

Table A4

Long-Term Interest Rates

Ten-year rates, period average, %

	2003	2004	2005	2006	2003	2004	2005	2006
	Year				2nd half			
Euro area	4.14	4.12	3.42	3.84	4.27	4.01	3.32	3.90
U.S.A.	4.00	4.26	4.28	4.79	4.25	4.23	4.34	4.77
Japan	0.99	1.50	1.39	1.74	1.29	1.55	1.44	1.75
United Kingdom	4.58	4.93	4.46	4.37	4.81	4.88	4.32	4.49
Switzerland	2.66	2.74	2.10	2.52	2.83	2.66	2.01	2.50
Czech Republic	4.12	4.75	3.51	3.78	4.43	4.76	3.47	3.86
Hungary	6.82	8.19	6.60	7.12	7.36	8.09	6.30	7.32
Poland	5.78	6.90	5.22	5.23	6.16	6.84	4.94	5.40
Slovak Republic	4.99	5.03	3.52	4.41	5.10	4.95	3.36	4.69
Slovenia	6.40	4.68	3.81	3.85	6.15	4.46	3.71	3.95

Source: Eurostat, national sources.

Table A5

Corporate Bond Spreads

Period average, percentage points

	2003	2004	2005	2006	2003	2004	2005	2006
	Year				2nd half			
Euro corporate bond spreads against euro benchmark	0.68	0.26	0.47	0.69	0.42	0.26	0.46	0.75
U.S. dollar corporate bond spreads against U.S. dollar benchmark	4.82	4.36	3.88	4.53	4.66	4.26	3.78	4.64

Source: Thomson Financial.

Table A6

Stock Indices[1]

Period average

	2003	2004	2005	2006	2003	2004	2005	2006
	Year				2nd half			
Euro area: EURO STOXX	213.29	251.14	293.81	357.33	227.31	251.59	309.27	366.74
U.S.A.: S&P 500	964.85	1,131.10	1,207.40	1,310.49	1,028.66	1,134.02	1,227.62	1,338.90
Japan: Nikkei 225	9,312.88	11,180.88	12,421.34	16,121.25	10,243.21	11,089.72	13,398.93	16,043.58
Austria: ATX	1,303.80	1,977.96	2,992.87	3,939.88	1,397.95	2,121.61	3,323.67	3,932.52
Czech Republic: PX50	558.24	828.23	1,255.53	1,478.63	610.19	885.05	1,360.54	1,482.35
Hungary: BUX	8,400.74	11,752.23	19,018.09	22,514.79	9,015.06	12,832.75	21,129.55	22,544.18
Poland: WIG	17,103.10	24,108.88	29,567.50	42,977.49	19,661.49	24,841.20	32,291.81	46,205.33
Slovak Republic: SAX16	164.08	213.42	437.07	402.98	171.34	243.28	452.05	400.33
Slovenia: SBI20	3,377.57	4,561.36	4,674.89	5,223.35	3,531.18	4,778.30	4,531.78	5,696.90

Source: Thomson Financial.

[1] *EURO STOXX: December 31, 1986 = 100, S&P 500: December 30, 1964 = 100, Nikkei 225: March 31, 1950 = 100, ATX: January 2, 1991 = 1,000, PX50: April 6, 1994 = 100, BUX: January 2, 1991 = 100, WIG: April 16, 1991 = 100, SAX: September 14, 1993 = 100, SBI20: January 1994 = 100.*

Table A7

Gross Domestic Product

Annual change in %, period average

	2003	2004	2005	2006	2003	2004	2005	2006
	Year				2nd half			
Euro area	0.8	2.0	1.4	2.7	0.8	1.7	1.8	3.1
U.S.A.	2.5	3.9	3.2	3.3	3.4	3.4	3.3	3.1
Japan	1.4	2.7	1.9	2.2	1.7	2.0	2.5	2.0
Austria	1.1	2.4	2.0	3.1	1.1	2.7	2.8	3.6
Czech Republic	3.6	4.2	6.1	6.1	3.9	4.5	6.3	5.9
Hungary	4.1	4.9	4.2	3.9	4.5	4.8	4.5	3.5
Poland	3.9	5.3	3.5	5.8	4.5	4.4	4.3	6.1
Slovak Republic	4.2	5.4	6.0	8.3	4.6	5.5	6.9	9.7
Slovenia	2.7	4.4	4.0	5.2	2.7	4.5	3.9	5.5

Source: Eurostat, national sources.

Table A8

Current Account

% of GDP, cumulative

	2003	2004	2005	2006	2003	2004	2005	2006
	Year				2nd half			
Euro area	0.4	0.6	−0.2	−0.3	0.7	0.7	−0.2	0.4
U.S.A.	−4.7	−5.6	−6.2	−6.4	−4.6	−6.0	−6.4	−6.4
Japan	3.5	4.0	3.6	3.5	3.4	3.6	3.7	. .
Austria	1.7	2.1	2.9	3.0	−1.2	−1.1	0.4	3.2
Czech Republic	−6.2	−6.0	−2.1	−4.7	−8.8	−7.7	−3.4	−6.2
Hungary	−8.1	−8.5	−6.9	−5.8	−7.4	−7.8	−7.1	−4.8
Poland	−2.1	−4.1	−1.6	−2.3	−1.3	−2.8	−1.9	−2.5
Slovak Republic	−6.0	−7.9	−8.7	−8.3	−5.3	−8.7	−10.1	−8.5
Slovenia	−0.8	−2.7	−2.0	−2.6	−0.5	−3.1	−3.2	−4.3

Source: Eurostat, European Commission, Thomson Financial, national sources.

Note: Due to seasonal fluctuations, the comparability of half-year figures with yearly figures is limited. The half-year figures for the U.S.A. are based on seasonally adjusted nominal GDP data.

Table A9

Inflation

Annual change in %, period average

	2003	2004	2005	2006	2003	2004	2005	2006
	Year				2nd half			
Euro area	2.1	2.1	2.2	2.2	2.1	2.3	2.3	2.0
U.S.A.	2.3	2.7	3.4	3.2	2.1	3.2	3.8	2.6
Japan	−0.3	0.0	−0.3	0.3	−0.3	0.2	−0.4	0.5
Austria	1.3	2.0	2.1	1.7	1.1	2.2	2.0	1.7
Czech Republic	−0.1	2.6	1.6	2.1	0.3	2.9	1.9	1.7
Hungary	4.7	6.8	3.5	4.0	5.0	6.5	3.4	5.5
Poland	0.7	3.6	2.2	1.3	1.1	4.6	1.5	1.4
Slovak Republic	8.4	7.5	2.8	4.3	9.2	6.8	2.9	4.1
Slovenia	5.7	3.7	2.5	2.5	5.3	3.6	2.4	2.4

Source: Eurostat.

The Real Economy in Austria

Table A10

Financial Investment of Households

Transactions, EUR million

	2003	2004	2005	2006[3]	2003	2004	2005	2006[3]
	Year				2nd half			
Currency and deposits[1]	8,229	6,048	5,472	6,930	3,584	3,480	2,146	4,594
Securities (other than shares)[2]	1,450	2,490	1,520	1,583	1,442	510	651	485
Shares (other than mutual fund shares)	831	962	1,778	1,794	195	428	213	180
Mutual fund shares	1,119	2,883	3,761	2,083	248	931	2,224	21
Insurance technical reserves	3,188	4,630	6,375	5,348	1,057	2,008	2,832	2,582
Total financial investment	14,817	17,013	18,906	17,738	6,526	7,357	8,066	7,862

Source: OeNB.

[1] *Including loans and other assets.*
[2] *Including financial derivatives.*
[3] *Preliminary data.*

Table A11

Household Income, Savings and Credit Demand

Year-end, EUR billion

	2003	2004	2005	2006
	Year			
Net disposable income	139.4	145.0	150.5	..
Savings	12.1	12.8	13.8	..
Saving ratio, in %[1]	8.6	8.8	9.1	..
MFI loans to households	89.40	98.33	111.27	115.48

Source: Statistics Austria (national accounts broken down by sectors), OeNB (financial accounts).

[1] *Saving ratio = savings / (disposable income + increase in accrued occupational pension benefits).*

Table A12

Financing of Nonfinancial Corporations

Transactions, EUR million

	2003	2004	2005	2006[1]	2003	2004	2005	2006[1]
	Year				2nd half			
Securities (other than shares)	4,299	2,909	4,255	2,586	4,039	1,871	3,191	1,345
Loans	5,757	4,859	6,678	6,066	3,032	3,782	3,915	2,215
Shares and other equity	3,608	4,592	7,157	10,442	-858	471	1,945	1,932
Other accounts payable	2,651	561	557	738	590	444	–729	162
Total debt	16,315	12,921	18,647	19,832	6,804	6,568	8,323	5,654

Source: OeNB.

[1] *Preliminary data.*

Table A13

Insolvency Indicators

	2003	2004	2005	2006	2003	2004	2005	2006
	Year				2nd half			
	EUR million							
Default liabilities	2,440	2,540	2,426	2,569	1,182	1,371	1,392	1,468
	Number							
Defaults	2,957	2,972	3,203	3,084	1,542	1,503	1,651	1,537

Source: Kreditschutzverband von 1870.

Table A14

Selected Financial Ratios of the Manufacturing Sector

Median, %

	2003	2004	2005	2006
Self-financing and investment ratios				
Cash flow, as a percentage of turnover	7.91	8.05	7.55	..
Self-financing of investments[1]	316.02	405.56	413.64	..
Reinvestment ratio[2]	47.06	59.09	45.00	..
Financial structure ratios				
Equity ratio	14.15	15.43	22.87	..
Risk-weighted capital ratio	19.22	20.99	29.43	..
Bank liability ratio	41.95	39.96	32.01	..
Government debt ratio	9.22	9.11	8.64	..

Source: OeNB.

[1] *Corresponds to the cash flow as a percentage of investment.*
[2] *Investment x 100 / credit write-offs.*

Financial Intermediaries in Austria[1]

Table A15

Total Assets and Off-Balance-Sheet Operations

End of period, EUR million

	2003		2004		2005		2006	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Total assets on an unconsolidated basis	591,867	605,107	636,035	652,758	697,505	725,761	765,258	797,758
of which: total domestic assets	419,571	430,888	441,250	452,306	463,815	479,817	493,966	504,241
total foreign assets	172,296	174,219	194,785	200,452	233,690	245,943	271,292	293,517
Interest rate contracts	2,204,721	1,853,494	1,891,262	1,241,189	1,266,274	1,247,825	1,278,429	1,360,613
Foreign exchange derivatives	298,475	305,447	255,755	216,284	245,677	240,564	264,876	279,686
Other derivatives	4,305	15,173	17,375	8,490	15,916	17,731	21,751	20,102
Derivatives total	2,507,501	2,174,114	2,164,392	1,465,963	1,527,867	1,506,120	1,565,056	1,660,401
Total assets on a consolidated basis	×	×	×	732,780	789,045	847,627	874,322	927,751

Source: OeNB.

Note: Data on off-balance-sheet operations refer to nominal values.

Table A16

Profitability on an Unconsolidated Basis

End of period, EUR million

	2003	2004	2005	2006	2003	2004	2005	2006
	1st half				Year			
Net interest income	3,497	3,530	3,547	3,563	7,058	7,131	7,094	7,170
Income from securities and participating interests	812	990	1,125	1,198	1,719	2,076	2,700	2,878
Net fee-based income	1,552	1,670	1,903	2,146	3,187	3,387	3,941	4,300
Net profit/loss on financial operations	384	309	333	445	618	607	642	688
Other operating income	591	590	621	709	1,292	1,255	1,333	1,581
Operating income	6,836	7,090	7,530	8,061	13,874	14,457	15,710	16,618
Staff costs	2,368	2,381	2,418	2,624	4,739	4,859	5,036	5,451
Other administrative expenses	1,508	1,511	1,628	1,706	3,108	3,107	3,332	3,516
Other operating expenses	768	780	776	838	1,620	1,748	1,694	1,828
Total operating expenses	4,644	4,672	4,822	5,168	9,468	9,715	10,063	10,795
Operating profit/loss	2,192	2,418	2,708	2,893	4,406	4,742	5,647	5,823
Net risk provisions from credit business[1, 3]	×	×	×	1,636	1,850	2,094	2,014	1,845
Net risk provisions from securities business[1, 3]	×	×	×	−723	−46	−1,154	−408	−2,875
Annual surplus[1, 3]	×	×	×	3,931	2,069	3,233	3,734	3,957
Return on assets[1, 2, 3]	×	×	×	1.03	0.34	0.50	0.51	0.50
Return on equity (tier 1 capital)[1, 2, 3]	×	×	×	19.7	7.0	10.1	10.7	9.5
Interest income to gross income (%)	×	×	×	44	51	49	45	43
Operating expenses to gross income (%)	×	×	×	64	68	67	64	65

Source: OeNB.

[1] *Data referring to the 1st half of 2006 are expected year-end values.*
[2] *Annual surplus in % of total assets and tier 1 capital, respectively.*
[3] *Data referring to 2006 are interim values of the fourth quarter of 2006.*

[1] *Since 2007, the International Monetary Fund (IMF) has published Financial Soundness Indicators (FSIs) for Austria (see also www.imf.org). The tables below have therefore been expanded to include FSIs as computed by the OeNB for banks operating in Austria. Figures published here may differ from those published by the IMF, which cover only domestically owned banks.*

Table A17

Profitability on a Consolidated Basis

End of period, EUR million

	2003	2004	2005	2006	2003	2004	2005	2006
	1st half				Year			
Operating income	×	×	10,259	11,713	×	19,292	21,153	23,993
Operating expenses	×	×	6,490	7,224	×	12,472	13,389	14,758
Operating profit/loss	×	×	3,769	4,488	×	6,821	7,765	9,235
Result before minority interests	×	×	2,471	3,712	×	4,408	5,341	8,696
Return on assets[1]	×	×	0.63	0.85	×	0.60	0.63	0.95
Return on equity (tier 1 capital)[1]	×	×	14.5	18.7	×	14.5	15.7	0.23
Interest margin to gross income (%)	×	×	63	60	×	64	62	59
Operating expenses to gross income (%)	×	×	63	62	×	65	63	62

Source: OeNB.

[1] Result before minority interests in % of total assets and tier 1 capital, respectively.

Table A18

Sectoral Distribution of Loans

End of period, EUR million

	2003		2004		2005		2006	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Nonfinancial corporations	111,178	110,840	108,979	109,924	111,334	108,944	114,171	116,078
of which: foreign currency-denominated loans	18,177	17,791	17,343	16,094	16,109	14,604	14,006	12,586
Households	84,723	87,358	93,984	97,130	100,375	107,561	109,255	111,404
of which: foreign currency-denominated loans	21,810	23,691	27,077	28,461	30,401	33,316	34,395	34,266
General government	27,501	29,945	29,679	31,238	30,192	29,141	29,856	28,662
of which: foreign currency-denominated loans	1,567	1,231	1,588	1,688	2,074	2,160	2,159	1,862
Other financial intermediaries	12,908	13,392	13,505	14,510	15,131	19,365	20,523	22,001
of which: foreign currency-denominated loans	1,394	1,412	1,594	1,667	2,030	3,216	3,491	3,353
Foreign nonbanks	50,782	51,585	55,774	56,434	66,163	69,273	74,014	80,985
of which: foreign currency-denominated loans	22,537	21,658	23,250	22,431	28,140	28,534	29,280	31,378
Nonbanks total	287,091	293,119	301,921	309,235	323,195	334,283	347,820	359,129
of which: foreign currency-denominated loans	65,485	65,783	70,851	70,341	78,754	81,830	83,331	83,445
Banks	169,653	168,915	183,949	182,416	199,908	201,117	218,833	230,320
of which: foreign currency-denominated loans	×	×	54,593	49,569	58,368	56,915	62,313	62,467

Source: OeNB.

Note: Due to changes in the reporting system as of the reporting month of June 2004, the time series for nonfinanial corporations and households had to be adjusted. Freelance professionals and self-employed persons are now classified under households. Any remaining breaks in the time series have been adjusted for the growth rates indicated in this report.

Table A19

Foreign Currency-Denominated Claims on Domestic Non-MFIs

End of period, % of total foreign currency-denominated claims on domestic non-MFIs[1]

	2003		2004		2005		2006	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Swiss franc	72.4	81.6	86.0	90.1	89.3	89.0	89.3	90.8
Japanese yen	21.6	12.2	7.1	5.6	5.2	3.9	2.8	2.8
U.S. dollar	5.2	5.0	5.6	3.6	4.8	6.3	6.8	5.5
Other foreign currencies	0.7	1.2	1.3	0.7	0.6	0.8	1.1	0.9

Source: OeNB, ECB.

[1] *The indicated figures refer to claims of monetary financial institutions (MFIs, ESA definition) on domestic non-MFIs. Given the differences in the definition of credit institutions according to the Austrian Banking Act and of MFIs according to ESA and differences in the number of borrowers, comparability to "Claims on Domestic Nonbanks" is limited. Due to rounding, figures do not add up to 100.0% for every year.*

Table A20

Loan Quality

	2003		2004		2005		2006	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
	End of period, % of claims							
Specific loan loss provisions for loans to nonbanks	3.5	3.3	3.4	3.3	3.2	3.1	3.1	2.9
Nonperforming loans	×	3.0	×	2.7	×	2.6	×	..
	End of period, % of tier 1 capital							
Nonperforming loans	×	59.2	×	53.1	×	52.6	×	..

Source: OeNB.

Table A21

Market Risk[1]

End of period, EUR million and % resp.

	2003		2004		2005		2006	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Interest rate risk								
Basel ratio for interest rate risk (%)[2]	7.8	7.8	7.5	6.1	6.4	6.6	6.3	5.6
Capital requirement for the position risk of interest rate instruments in the trading book	420.6	470.2	514.8	609.8	810.3	703.0	792.6	737.3
Exchange rate risk								
Capital requirement for open foreign exchange positions	81.8	54.9	66.1	52.9	97.3	93.3	101.8	75.2
Maximum open position in foreign exchange to capital (%)[3]	2.1	2.2	1.1	2.1	3.4	3.2	2.8	2.3[4]
Equity price risk								
Capital requirement for the position risk of equities in the trading book	25.4	28.4	52.4	43.4	71.1	95.9	94.0	101.0

Source: OeNB.

[1] *The calculation of capital requirements for market risk combines the standardized approach and internal value-at-risk (VaR) calculations. The latter use previous day's values without taking account of the multiplier. Capital requirements for interest rate instruments and equities are computed by adding up both general and specific position risks.*

[2] *Average of the Basel ratio for interest rate risk (loss of present value following a parallel yield curve shift of all currencies by 200 basis points in relation to regulatory capital) weighted by total assets of all Austrian credit institutions excluding banks that operate branches in Austria under freedom of establishment. For banks with a securities trading book, interest rate instruments of the trading book are not included in the calculation.*

[3] *The maximum open position in foreign exchange refers to the monthly peaks of the 12 currencies to be included in the monthly report. A net position is calculated for each currency across all banks. The absolute values of the net positions are added up across currencies.*

[4] *Refers to November 30, 2006.*

Table A22

Liquidity Risk

End of period, %

	2003		2004		2005		2006	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Liquid assets to total assets	×	×	×	×	28.1	27.4	27.7	27.6
Liquid assets to short-term liabilities	×	×	×	×	71.6	68.0	69.8	68.6
Liquid resources of the first degree: 5% quantile of liquidity ratio[1]	5.1	4.5	4.3	4.4	4.4	4.5	4.3	3.9
Liquid resources of the second degree: 5% quantile of liquidity ratio	26.5	25.1	25.3	24.0	24.2	23.5	23.5	22.2

Source: OeNB.

[1] *The liquidity ratio relates liquid assets to the corresponding liabilities. Article 25 of the Austrian Banking Act defines a minimum ratio of 2.5 % for liquid resources of the first degree (cash ratio) and of 20% for liquid resources of the second degree (current ratio). The 5% quantile indicates the liquidity level surpassed by 95% of banks on the respective reporting date and is thus an indicator of poor liquidity.*

Table A23

Solvency

End of period, eligible capital and tier 1 capital, respectively, as a percentage of risk-weighted assets

	2003		2004		2005		2006	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Unconsolidated capital adequacy ratio[1]	13.9	14.5	14.8	14.7	14.8	14.7	15.4	15.1
Unconsolidated tier 1 capital ratio	9.5	9.9	10.1	10.0	10.1	9.9	10.7	10.6
Consolidated capital adequacy ratio	×	×	×	12.2	12.4	11.7	12.4	11.6
Consolidated tier 1 capital ratio	×	×	×	8.3	8.7	8.1	8.9	8.1

Source: OeNB.

[1] *The capital adequacy ratio refers to the capital eligible as credit risk cover under the Austrian Banking Act (i.e. tier 1 capital plus tier 2 capital minus deduction items) as a percentage of the assessment base. As tier 3 capital is subordinated capital that may only be allocated against market risk, it was not included here so as to produce a conservative capital adequacy assessment.*

Table A24

Assets Held by Austrian Insurance Companies[1]

End of period, EUR million

	2003		2004		2005		2006	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Cash, overnight and other deposits at domestic banks	3,617	2,106	1,744	2,516	2,472	2,570	3,218	2,343
Domestic debt securities	8,488	9,101	9,175	8,909	9,238	9,309	9,840	10,238
of which: domestic banks	6,264	6,824	6,938	7,068	7,519	7,647	8,021	8,418
Equity securities and other domestic securities	14,648	15,204	15,987	17,359	19,387	21,208	21,754	23,552
Loans	7,441	7,303	6,733	6,504	5,933	5,724	4,701	4,314
of which: domestic banks	137	146	148	161	206	366	407	468
Domestic equity interests	3,550	3,588	3,682	3,906	3,928	3,965	4,315	4,442
Real estate	3,526	3,573	3,438	3,361	3,340	3,288	3,118	3,117
Foreign assets	15,597	17,261	19,209	20,691	22,964	25,058	26,439	28,693
of which: debt securities	11,776	12,755	14,979	15,648	17,002	18,230	19,333	20,362
Custody account claims on deposits on reinsurers	. .	2,149	. .	2,260	. .	2,163	. .	. .
Other assets	3,734	3,548	4,068	3,594	4,361	4,048	5,199	4,101
Total assets	62,320	63,833	65,927	69,100	73,433	77,333	80,339	82,522

Source: OeNB.

[1] *Semiannual data exclusive of reinsurance transactions, based on quarterly reports.*

Table A25

Assets Held by Austrian Mutual Funds

End of period, EUR million

	2003		2004		2005		2006	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Domestic securities	34,653	34,309	35,405	37,341	43,052	47,032	46,422	49,593
of which: debt securities	20,743	19,436	19,058	19,025	20,545	20,350	18,302	17,632
equity securities	13,910	14,873	16,347	18,316	22,507	26,682	28,120	31,961
Foreign securities	66,706	69,435	75,707	80,505	91,473	100,367	102,876	109,288
of which: debt securities	48,531	48,952	53,022	56,821	64,635	68,054	69,482	70,280
equity securities	18,175	20,483	22,685	23,684	26,838	32,313	33,394	39,008
Other assets	5,774	7,274	7,530	7,441	7,984	9,286	10,232	9,963
Total assets	107,133	111,018	118,642	125,287	142,509	156,685	159,530	168,844
of which: foreign currency	22,376	22,178	24,328	24,591	28,085	32,694	32,699	36,790

Source: OeNB.

Table A26

Assets Held by Austrian Pension Funds

End of period, EUR million

	2003		2004		2005		2006	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Domestic securities	7,744	8,267	8,770	9,179	9,744	10,112	10,074	10,742
of which: federal treasury bills and notes	0	0	0	0	0	0	0	0
debt securities	56	45	121	108	96	98	89	116
mutual fund shares	7,641	8,159	8,607	9,019	9,579	9,949	9,921	10,589
other securities	47	63	42	52	69	65	64	37
Foreign securities	425	405	460	525	727	1,006	1,010	1,224
of which: debt securities	47	44	15	27	69	74	81	73
mutual fund shares	350	330	417	469	645	906	903	1,113
other securities	29	31	28	29	13	26	26	38
Deposits	164	221	72	125	95	113	150	173
Loans	67	42	59	83	94	94	99	93
Other assets	161	143	147	170	196	224	220	264
Total assets	8,562	9,078	9,508	10,082	10,856	11,549	11,553	12,496
of which: foreign currency	233	212	236	249	272	312	327	555

Source: OeNB.

Table A27

Assets Held by Austrian Severance Funds

End of period, EUR million

	2003		2004		2005		2006	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Total direct investment	6.3	38.5	64.9	92.3	129.4	158.7	228.7	295.6
of which: euro-denominated	6.3	38.2	64.0	89.2	122.5	153.8	223.3	288.4
foreign currency-denominated	0.0	0.0	0.0	×	×	×	×	×
accrued income claims from direct investment	0.0	0.4	0.9	×	2.0	3.2	2.4	4.2
Total indirect investment	12.1	59.5	123.5	269.6	382.3	537.8	658.1	832.5
of which: total of euro-denominated investment in mutual fund shares	11.8	59.2	122.8	266.6	370.4	490.4	608.1	781.4
total of foreign currency-denominated investment in mutual fund shares	×	0.0	×	3.2	11.9	47.4	50.0	51.1
Total assets assigned to investment groups	18.4	146.5	188.5	362.1	511.7	696.5	886.5	1.128.1
of which: foreign currency-denominated	×	0.0	×	4.9	16.9	49.1	52.4	54.2

Source: OeNB.

Note: Due to special balance sheet operations total assets assigned to investment groups deviate from the sum of total indirect investments.

Table A28

Transactions and System Disturbances in Payment and Securities Settlement Systems

Number of transactions in million, value of transactions in EUR billion

	2004		2005		2006	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
ARTIS/TARGET						
Number	1.8	3.7	1.9	4.0	2.1	4.4
Value	4,174.5	8,470.0	5,077.8	10,412.9	5,780.8	11,563.3
System disturbances	4	4	0	8	1	2
Securities settlement systems						
Number	0.5	1.0	0.8	1.9	1.7	3.0
Value	89.8	187.9	157.3	309.8	267.1	448.6
System disturbances	0	0	0	0	0	0
Retail payment systems						
Number	181.1	377.9	197.4	412.3	216.5	448.5
Value	15.4	31.5	15.5	31.1	16.9	35.3
System disturbances	12	17	12	41	25	58
Participation in international payment systems						
Number	3.0	8.8	5.9	12.0	7.5	16.8
Value	578.0	1,101.1	562.0	1,127.4	702.2	1,468.8
System disturbances	11	15	5	8	1	4

Source: OeNB.

NOTES

Abbreviations

ARTIS	Austrian Real Time Interbank Settlement (the Austrian RTGS system)
A-SIT	Secure Information Technology Center – Austria
ASVG	Allgemeines Sozialversicherungsgesetz – General Social Security Act
A-Trust	A-Trust Gesellschaft für Sicherheitssysteme im elektronischen Datenverkehr GmbH
ATX	Austrian Traded Index
BCBS	Basel Committee on Banking Supervision (BIS)
BIC	Bank Identifier Code
BIS	Bank for International Settlements
BOP	balance of payments
BSC	Banking Supervision Committee (ESCB)
CACs	collective action clauses
CEBS	Committee of European Banking Supervisors (EU)
CEE	Central and Eastern Europe
CEECs	Central and Eastern European countries
CESR	Committee of European Securities Regulators
CIS	Commonwealth of Independent States
CPI	consumer price index
EBA	Euro Banking Association
EBRD	European Bank for Reconstruction and Development
EC	European Community
ECB	European Central Bank
Ecofin	Council of Economic and Finance Ministers (EU)
EEA	European Economic Area
EFC	Economic and Financial Committee (EU)
EIB	European Investment Bank
EMS	European Monetary System
EMU	Economic and Monetary Union
EONIA	Euro OverNight Index Average
ERM II	Exchange Rate Mechanism II (EU)
ERP	European Recovery Program
ESA	European System of Accounts
ESAF	Enhanced Structural Adjustment Facility (IMF)
ESCB	European System of Central Banks
ESRI	Economic and Social Research Institute
EU	European Union
EURIBOR	Euro Interbank Offered Rate
Eurostat	Statistical Office of the European Communities
FATF	Financial Action Task Force on Money Laundering
Fed	Federal Reserve System
FMA	Financial Market Authority (for Austria)
FOMC	Federal Open Market Committee (U.S.A.)
FSAP	Financial Sector Assessment Program (IMF)
FWF	Fonds zur Förderung der wirtschaftlichen Forschung – Austrian Science Fund
GAB	General Arrangements to Borrow
GATS	General Agreement on Trade in Services
GDP	gross domestic product
GNP	gross national product
GSA	GELDSERVICE AUSTRIA Logistik für Wertgestionierung und Transportkoordination GmbH (Austrian cash services company)
HICP	Harmonized Index of Consumer Prices
HIPC	Heavily Indebted Poor Countries
IBAN	International Bank Account Number
IBRD	International Bank for Reconstruction and Development
ICT	information and communication technology
IDB	Inter-American Development Bank
IFES	Institut für empirische Sozialforschung GesmbH (Institute for Empirical Social Research, Vienna)
ifo	ifo Institute for Economic Research, Munich
IHS	Institut für Höhere Studien und Wissenschaftliche Forschung – Institute for Advanced Studies, Vienna
IIF	Institute of International Finance
IIP	international investment position
IMF	International Monetary Fund
ISO	International Organization for Standardization
IWI	Industriewissenschaftliches Institut – Austrian Institute for Industrial Research
JVI	Joint Vienna Institute
LIBOR	London Interbank Offered Rate
M3	broad monetary aggregate M3
MFI	monetary financial institution
MRO	main refinancing operation
MoU	memorandum of understanding
NACE	Statistical Classification of Economic Activities in the European Community
NCB	national central bank
OeBS	Oesterreichische Banknoten- und Sicherheitsdruck GmbH – Austrian Banknote and Security Printing Works
OECD	Organisation for Economic Co-operation and Development
OeKB	Oesterreichische Kontrollbank (Austria's main financial and information service provider for the export industry and the capital market)
OeNB	Oesterreichische Nationalbank (Austria's central bank)
OPEC	Organization of the Petroleum Exporting Countries
ÖBFA	Austrian Federal Financing Agency
ÖNACE	Austrian Statistical Classification of Economic Activities
POS	point of sale
PRGF	Poverty Reduction and Growth Facility (IMF)
RTGS	Real-Time Gross Settlement
SDR	Special Drawing Right (IMF)
SDRM	Sovereign Debt Restructuring Mechanism (IMF)
SEPA	Single Euro Payments Area
SPF	Survey of Professional Forecasters
STEP2	Straight-Through Euro Processing system offered by the Euro Banking Association
STUZZA	Studiengesellschaft für Zusammenarbeit im Zahlungsverkehr G.m.b.H. – Austrian Research Association for Payment Cooperation
S.W.I.F.T.	Society for Worldwide Interbank Financial Telecommunication
TARGET	Trans-European Automated Real-time Gross settlement Express Transfer
Treaty	refers to the Treaty establishing the European Community
UNCTAD	United Nations Conference on Trade and Development
UNO	United Nations Organization
VaR	Value at Risk
WBI	Wiener Börse Index
WEF	World Economic Forum
WIFO	Österreichisches Institut für Wirtschaftsforschung – Austrian Institute of Economic Research
WIIW	Wiener Institut für internationale Wirtschaftsvergleiche – The Vienna Institute for International Economic Studies
WKO	Wirtschaftskammer Österreich – Austrian Federal Economic Chamber
WTO	World Trade Organization

Legend

x = No data can be indicated for technical reasons

.. = Data not available at the reporting date

0 = The numerical value is zero or smaller than half of the unit indicated

Discrepancies may arise from rounding.

List of Special Topics Published in the Financial Stability Report Series

For further details on the following publications see *www.oenb.at*

Financial Stability Report 10

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Capital Market-Oriented Financing Prospects for Austrian SMEs
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Michael Boss, Gerald Krenn, Claus Puhr, Martin Summer

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Austrian Banks' Lending and Loan Pricing Strategies against the Background of Basel II
Johannes Jäger, Vanessa Redak

Determinants of the Interest Rate Margins of Austrian Banks
David Liebeg, Markus S. Schwaiger

Periodical Publications of the Oesterreichische Nationalbank

For further details see *www.oenb.at*

Monetary Policy & the Economy

quarterly

This quarterly publication, issued both in German and English, offers analyses of current cyclical developments, medium-term macroeconomic forecasts and studies on central banking and economic policy topics. It also summarizes the findings of macroeconomic workshops and conferences organized by the OeNB.

Statistiken – Daten & Analysen

quarterly

This publication contains brief reports and analyses focusing on Austrian financial institutions, cross-border transactions and positions as well as financial flows. The contributions are in German, with executive summaries of the analyses in English. The statistical part covers tables and explanatory notes on a wide range of macroeconomic and financial indicators. The tables and additional information and data are also available on the OeNB's website in both German and English. This series also includes special issues on selected statistics topics published at irregular intervals.

econ.newsletter

quarterly

The quarterly English-language newsletter is published only on the Internet and informs an international readership about selected findings, research topics and activities of the OeNB's Economic Analysis and Research Section. This publication addresses colleagues from other central banks or international institutions, economic policy researchers, decision makers and anyone with an interest in macroeconomics. Furthermore, the newsletter offers information on current publications, studies or working papers as well as events (conferences, lectures and workshops).

For further details see *www.oenb.at/econ.newsletter*

Financial Stability Report

semiannual

Issued both in German and English, the Financial Stability Report contains first, a regular analysis of Austrian and international developments with an impact on financial stability and second, studies designed to provide in-depth insights into specific topics related to financial market stability.

Focus on European Economic Integration

semiannual

The English-language publication Focus on European Economic Integration is the successor publication to Focus on Transition (published up to issue 2/2003). Reflecting a strategic regional research priority of the OeNB, this publication is a channel for communicating our ongoing research on Central and Eastern European countries (CEECs) as well as Southeastern European (SEE) countries ranging from economic country studies to studies on central banking issues and related topics. One of the purposes of publishing theoretical and empirical studies in the Focus on European Economic Integration, which are subject to an external refereeing process, is to stimulate comments and suggestions prior to possible publication in academic journals.

Workshops – Proceedings of OeNB Workshops

three to four issues a year

The Proceedings of OeNB Workshops were introduced in 2004 and typically comprise papers presented at OeNB workshops at which national and international experts, including economists, researchers, politicians and journalists, discuss monetary and economic policy issues. Workshop proceedings are available in English only.

Working Papers

about ten papers a year

The OeNB's Working Paper series is designed to disseminate, and provide a platform for discussing, findings of OeNB economists or outside contributors on topics which are of special interest to the OeNB. To ensure the high quality of their content, the contributions are subjected to an international refereeing process.

Economics Conference (Conference Proceedings)

annual

The Economics Conference hosted by the OeNB represents an important international platform for exchanging views and information on monetary and economic policy as well as financial market issues. It convenes central bank representatives, economic policymakers, financial market players, academics and researchers. The conference proceedings comprise all papers presented at the conference, most of them in English.

Conference on European Economic Integration (Conference Proceedings)

annual

This series, published in English by a renowned international publishing house, reflects presentations made at the OeNB's annual conference on Central, Eastern and Southeastern European issues and the ongoing EU enlargement process (formerly East-West Conference).

For further details see *ceec.oenb.at*

Annual Report

annual

The Annual Report of the OeNB provides a broad review of Austrian monetary policy, economic conditions, new developments in the financial markets in general and in financial market supervision in particular as well as of the OeNB's changing responsibilities and its role as an international partner in cooperation and dialogue. It also contains the OeNB's financial statements.

Intellectual Capital Report

annual

The Intellectual Capital Report has been published since 2003 as a review of the OeNB's intellectual capital and its use in the OeNB's business processes and services. The report provides an integrated view of the strategically important management of human, relational, structural and innovation capital; it clarifies the relationships between different types of capital and describes various determinants that influence the OeNB's intellectual capital. The findings of the report serve to assess the consistency of the OeNB's intellectual capital with its knowledge-based strategic orientation.

Publications on Banking Supervision

Guidelines on Credit Risk Management

The increasing use of innovative financial products such as securitization or credit derivatives and the further development of modern risk management methods lead to significant changes in the business environment of credit institutions. The credit sector is particularly affected by these innovations, with internal software systems and relevant business processes having to be adapted to cope with the new environment. "Guidelines on Credit Risk Management" is designed to assist in redesigning the systems and processes within a bank in the course of implementing Basel II.

Rating Models and Validation
www.oenb.at/en/img/rating_models_tcm16-22933.pdf

Best Practices in Risk Management for Securitized Products
www.oenb.at/en/img/lf_securit_engl_tcm16-23501.pdf and

Appendix B: Securitization Framework in Basel II
www.oenb.at/en/img/appendix_b_englisch_06122004_tcm16-23500.pdf

Credit Approval Process and Credit Risk Management
www.oenb.at/en/img/credit_approval_process_tcm16-23748.pdf

Credit Risk Models and Credit Derivatives
(By Gaal, A. and M. Plank. 1998. In: Focus on Austria 4/1998, OeNB.)
www.oenb.at/en/img/credit_risk_tcm16-11201.pdf

Legal Framework in Croatia
www.oenb.at/en/img/croatia_screen_tcm16-45599.pdf

Legal Framework in Poland
www.oenb.at/en/img/poland_screen_tcm16-45602.pdf

Legal Framework in Slovakia
www.oenb.at/en/img/slovakia_screen_tcm16-45603.pdf

Legal Framework in Slovenia
www.oenb.at/en/img/slovenia_screen_tcm16-45604.pdf

Legal Framework in Hungary
www.oenb.at/en/img/hungary_screen_tcm16-45600.pdf

Legal Framework in the Czech Republic
www.oenb.at/en/img/czech_republic_screen_tcm16-45601.pdf

Guidelines on Market Risk

Two volumes of this six-volume series of guidelines centering on the various facets of market risk provide information on how the Oesterreichische Nationalbank appraises value-at-risk models and on how it audits the standardized approach. The remaining four volumes discuss in depth stress testing for securities portfolios, the calculation of regulatory capital requirements to cover option risks, the general interest rate risk of debt instruments, and other risks associated with the trading book, including default and settlement risk.

General Market Risk of Debt Instruments
(2nd revised and extended edition) (Volume 1)
www.oenb.at/en/img/band1ev40_tcm16-20471.pdf

Standardized Approach Audits (Volume 2)
www.oenb.at/en/img/band2ev40_tcm16-20472.pdf

Evaluation of Value-at-Risk Models (Volume 3)
www.oenb.at/en/img/band3ev40_tcm16-20473.pdf

Provisions for Option Risks (Volume 4)
www.oenb.at/en/img/band4ev40_tcm16-20474.pdf

Stress Testing (Volume 5)
www.oenb.at/en/img/band5ev40_tcm16-20475.pdf

Other Risks Associated with the Trading Book (Volume 6)
www.oenb.at/en/img/band6ev40_tcm16-20476.pdf

Guidelines on Operational Risk Management and Bank-Wide Risk Management

Guidelines on Operational Risk Management
www.oenb.at/en/img/operational_risk_screen_tcm16-49652.pdf

These guidelines describe the features of operational risk, evaluate the significance of this risk category for banks and securities firms, and provide an overview of methods and measures adopted to control operational risks. The guidelines explore the major risk areas and risk control/limitation measures in line with the four causes of operational risk (people, systems, processes, external events) and also assess associated legal risks. Furthermore, the guidelines offer an overview of the methods used to calculate (quantitative and qualitative) capital requirements.

Guidelines on Bank-Wide Risk Management

www.oenb.at/en/img/lf_icaap_englisch_gesamt_tcm16-39190.pdf

The Guidelines on Bank-Wide Risk Management (Internal Capital Adequacy Assessment Process) give a detailed overview of assessment procedures in all major risk categories. They provide in-depth information on the different types of capital and their suitability for risk cover. Moreover, the guidelines present quantitative methods and procedures to determine the risk-bearing-capacity of a credit institution. A separate section highlights the significance of having a limit system in place that is adequate in a given risk scenario and underscores the need for efficient internal control mechanisms.

Other Publications

Structured Products Handbook

www.oenb.at/en/img/phb_internet_tcm16-11173.pdf

The first part of the „Structured Products Handbook" deals with structured bonds whose payoff properties depend on interest rate movements, and the following two parts focus on products whose payoff characteristics are shaped by equity prices and foreign exchange rates.

New Quantitative Models of Banking Supervision

www.oenb.at/en/img/new_quantitative_models_of_banking_supervision_tcm16-24132.pdf

Off-Site Analysis Framework of Austrian Banking Supervision – Austria Banking Business Analysis

www.oenb.at/en/img/offsiteanalysis_internet_tcm16-33280.pdf

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