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Editorial close: May 11, 2005

Opinions expressed by the authors of studies do not necessarily reflect the official viewpoint of the OeNB.

R E P O R T S

Austria's Financial System Has Further Improved Its Resilience to Crises

Global Economic Recovery Weakened Slightly

The global economy, which had grown strongly in 2004, expanded at a slightly slower pace in the first few months of 2005. Growth was mainly driven by the United States, China and the emerging economies in Eastern Asia, whereas the Japanese and the euro area economies grew at a slower pace. While maintaining a positive growth differential with the euro area, Central and Eastern European countries (CEECs) also posted partly even considerably lower growth rates at the beginning of 2005.

International Financial Markets Develop Favorably

Despite fairly vigorous economic activity, long-term yields in the international bond markets remained unusually low until spring 2005. At the same time, corporate bond spreads remained also very low compared with government bonds of similar maturity. While on the one hand reflecting the¹ favorable corporate profit situation, on the other hand this development showed that institutional investors continued to tolerate high risks and intensified their quest for yields in light of the low nominal interest rate levels.

The favorable profit outlook for companies has also contributed significantly to the stock price increases in the euro area equity markets until spring 2005. In 2004 and in the first quarter of 2005, the uptrend of the Austrian Traded Index ATX continued to exceed the development of the major international stock indices.

The performance of Austrian investors' portfolios benefited from the generally favorable environment of the financial markets. This held true for both institutional investors (such as insurance companies or investment funds) and households, which managed to compensate for a large part of the valuation losses in the financial assets they had suffered due to plunging stock prices between 2000 and 2002.

Mirroring these developments, downward risks prevailed in the financial markets in the spring of 2005. U.S. external imbalances continued to be high, which involved the risk of abrupt currency shifts and might, in turn, lead to a noticeable hike in long-term interest rates especially in the U.S.A. High oil prices constituted another important risk factor.

Profitability of Central and Eastern European Banking Sector Improves Further

In 2004, Central and Eastern European banks again posted high average returns on equity. The big Austrian banking groups continued to expand their business in CEE, and the profits earned in this region again represented a large portion of the Austrian banking groups' operating results. This contribution to income is in part attributable to the high valuation of the major CEE currencies as a result of the current international environment and the largely favorable fundamentals. Hence, potential currency valuation changes pose a certain risk for subsidiaries' future contributions to Austrian banks' operating results.

¹ In early May, however, the corporate bonds of General Motors and Ford - two of the most important issuers on the U.S. bond market - were downgraded to junk bond status.

Financial Position of Austrian Companies and Households Strengthened

The Austrian economy was not entirely immune to the decline in euro area growth. In 2004, companies were still able to raise their profits and therefore to rely on internal sources of finance for their investments. They used a wide range of financing instruments for external funding, with bank loans posting positive growth rates for the first time in two years. In recent quarters, the corporate sector's overall resilience to shocks generally strengthened as a result of improved balance sheet structures, higher profits and the fact that financing conditions continue to be favorable.

The assessment of the household sector's financial situation, by contrast, produces more complex results: In 2004, households' financial assets of households showed the highest growth rate since the introduction of financial account statistics, while their total debt rose further. In this context, the growth of assets and loans appears to have been distributed unevenly across individual households. Unlike in other euro area countries, the real estate market in Austria has not overheated so far.

Austrian Banks' Risk Profile Improved

The Austrian banking sector's risk profile improved in 2004. The higher profitability in domestic business is attributable to a significant increase in in-

come from participating interests and in fee-based income as well as to a lower need for risk provisions. The capital ratio is still high, and stress tests also confirmed the banking sector's resilience to shocks. All in all, Austria's banking system does not show any signs of particular fragility.

However, the Austrian banking sector still has to cope with its traditional weaknesses: The cost burden remained comparatively high, even though the cost/income ratio declined. As a result of fierce competition, interest income is low by international standards, with banks' interest margins declining even further in 2004. Even though margins are small, interest income still constitutes a reliable income component for Austrian banks. At present, the sound profitability of Austrian banking subsidiaries in the CEECs contributes significantly to the increased risk-bearing capacity of Austria's banking sector but drives up the dependency on future developments in these markets.

The growing share of foreign currency loans in total domestic lending needs to be constantly monitored. Even if we consider that the reported loan volumes represent an upper limit as creditors pay separately into repayment vehicles to save for loan repayment, the volume of foreign currency loans in the euro area remains high. In a development that has doubtlessly fostered stability, however, Swiss franc-denominated loans have almost completely replaced Japanese yen-denominated financing.

International Environment Increasingly Fraught with Risk

Low Interest Rates Favor Robust Growth, but Risks Increase

While Global Economic Growth Is Robust, Growth Weakens in the Euro Area and Japan

Coming to some 5% in 2004, the global economy posted the highest growth rate since the 1970s according to the IMF, even though the second half of the year was slightly less dynamic. The higher oil price seems to have been the main reason for this slowdown. In the course of 2004, the oil price in U.S. dollars climbed by up to 50% against the previous year, thus exceeding the development expected in most economic forecasts. In the first quarter of 2005, the oil price remained high and price volatility went up noticeably. Most forecasts expect oil prices to remain at a high level over the next few years. According to forecasts for 2005 and 2006 by the IMF, the OECD and the European Commission, economic growth will continue to be robust, with growth rates hovering around the long-term average and inflation remaining moderate. The risks for this favorable growth outlook, however, point mostly downward. In this context, the U.S. current account deficit, which is generally estimated to be too high, continues to give cause for concern. The IMF e.g. argues that the U.S. dollar might depreciate substantially and long-term interest rates might rise, especially in the U.S.A., if international investors were no longer willing to accumulate or hold U.S. dollar-denominated financial instruments. The oil price represents another risk factor: Should the oil price remain high or rise even further, it would dampen growth more considerably than currently expected. This could trigger a buildup of inflationary pressure, which might cause long-term interest rates to

surge. This, in turn, would entail certain risks with regard to possible corrections of the relatively high real estate prices in several countries as well as to widening spreads.

In the U.S.A., two factors played a key role in maintaining robust economic growth rates despite the higher oil price: solid (though recently slightly slower) productivity growth and a continued commitment to supportive fiscal and monetary policies. On the back of solid income growth, positive wealth effects, growing employment and high consumer confidence, consumer spending was dynamic, as was corporate investment, which benefited from positive turnover expectations as well as from favorable financing conditions and temporary tax advantages. The high oil prices drove up the inflation rate, whereas the relatively modest growth of labor unit costs and the continued availability of production capacities have so far kept domestic inflationary pressures low. Since June 2004, key interest rates have been raised to 2.75% in seven moves (by a total of 175 basis points) in light of the robust economic upswing, stable inflation expectations, the limited upward pressure on inflation as well as the balanced risks for future inflation and future economic growth as assessed by the Federal Open Market Committee (FOMC).

After a strong start in 2004, growth in Japan slowed down considerably and was slightly negative for three quarters in a row. In particular exports of IT goods and consumer spending declined. Given the favorable international environment, the IMF expects a renewed upswing; as demand in relation to aggregate supply is relatively low, however, persistently positive inflation rates will probably not be achieved in the short term, which suggests

that the Bank of Japan will continue its accommodative monetary policy.

In *non-Japan Asia*, the strong economic growth observed in the first half of 2004 continued as inflation remained largely moderate. China again posted tremendous growth rates although economic policy measures were taken to slow down this rapid growth. In 2004, the build-up of substantial (mostly U.S. dollar-denominated) foreign reserves in the region continued owing to financial account and current account surpluses, with China accounting for the largest share of that increase. This trend seems to have contributed to the low yields of U.S. government bonds as well.

Growth in the *United Kingdom* slowed down slightly in recent quarters, thus approaching trend growth. Consumer spending and investment lost some momentum in the process. As expected, the higher short-term interest rates helped stabilize real estate prices after years of heavy growth. Even though capacity utilization continued to rise and unemployment remained low, wages have not triggered any significant upward pressure on inflation so far. Between May 2003 and August 2004, key interest rates were raised by a total of 125 basis points to counter the upward pressure on inflation expected to result from high capacity utilization.

Since mid-2004, growth in the *Swiss* economy slowed down at a faster pace than expected, which has affected investment as well as exports and consumer spending. The inflation rate remained low. In 2005, the Swiss economy should pick up again as exports are improving and financing conditions are favorable. In June 2004, key interest rates were raised by 25 basis points; slower economic activity, among other factors, has kept them steady since

then. The *Schweizerische Nationalbank* announced that it would take appropriate measures in case unexpected developments caused the Swiss franc to appreciate.

In the second half of 2004, growth in the *euro area* slowed down noticeably, with Germany and Italy, inter alia, experiencing the strongest impact. Given the high and volatile oil prices, domestic demand in the euro area was generally subdued, whereas the slower pace of global growth and the appreciation of the euro caused the growth in export demand – which had contributed significantly to the economic upturn in the first half of 2004 – to decline. Corporate profits recovered, but this development has not yet led to a significant increase in corporate investment, as enterprises tend to prioritize restructuring their balance sheets. Wage moderation as well as currently low employment growth have dampened consumer demand. Higher oil prices temporarily drove up HICP inflation, whereas domestic price pressures remained low as wages went up only moderately and the higher oil prices have not triggered any second-round effects so far. Given the low domestic price pressure, the key interest rates have been left at 2%. Growth, and especially domestic demand, is expected to accelerate gradually in 2005 and 2006.

Weak Dollar and Unusually Low Long-Term Interest Rates

In the second quarter of 2004, interest rates started to rise in the U.S. *money markets*. Market expectations were considerably influenced by the Federal Reserve's announcement to raise key interest rates at a measured pace in the future. In March 2005, growing inflation concerns gave rise to expectations of a faster key interest rate hike. After a

series of unfavorable economic data was published in early April, these expectations receded again. In the euro area, money market interest rates remained mostly unchanged owing to stable long-term inflation expectations and slackening economic activity. The implied volatilities in the U.S. and euro area money markets decreased further.

Yields in the U.S. *bond markets* remained largely unchanged after having declined between the third quarter of 2004 and February 2005. Given the favorable economic outlook and the Fed's substantial rise of key interest rate, this came as a surprise to many observers, as yields have tended to go up markedly in such conditions. In February, a speech by the FOMC chairman as well as speculations about accelerated key interest rate hikes sparked a rapid rise in bond yields, which, however, receded when these speculations were dispelled. Long-term inflation risk premiums, measured against indexed

bonds, continued to trend upward in recent quarters. In the euro area, yields continued to fall between September 2004 and the beginning of January 2005, as bond prices have gone up, apparently as a result of unexpectedly low economic activity and the weak U.S. dollar. By long-term comparison, inflation risk premiums fluctuated at a somewhat higher level.

In February, the risk premiums for *corporate bonds* in the U.S.A. and the euro area reached a very low level by long-term comparison and have clearly increased since then, following the release of negative data on the creditworthiness of large U.S. car manufacturers. By long-term comparison, the level of risk premiums is relatively low, which suggests that investors continue to be willing to take high risks; the favorable overall profit situation seems to have had a positive impact on corporate balance sheets, thus reducing the risk of future defaults.

Chart 1

Interest Rate Profile in the Euro Area and the U.S.A.



Source: Thomson Financial.

Stock market prices in the U.S.A. remained mostly stable; however, the effects of the sound profit situation were partly offset by high oil prices and the recently somewhat increased long-term interest rates as well as by the fact that risk aversion increased slightly from a previously low level. In the euro area, stock prices continued their upward trend until March 2005, mainly on the back of high corporate profits and long-term interest rates, which had dropped more sharply in the euro area than in the U.S.A.

The pronounced dollar weakness on the *foreign exchange markets* in the fourth quarter of 2004 appeared to be related to the high current account deficit and the prolonged period of low long-term interest rates in the U.S.A. The extent of the nominal effective appreciation of the euro was smaller, however, than in past periods of dollar weakness. Speculation about a future appreciation of the Chinese yuan put some additional upward pressure on the Japanese yen, which nonetheless depreciated against both the U.S. dollar and the euro owing to slow economic activity. The Swiss franc remained fairly stable against the euro. In the reporting period, the foreign exchange markets were very sensitive to information suggesting portfolio shifts from U.S. dollar-denominated official foreign exchange reserves to other currencies. The euro and the Swiss franc responded with partly noticeable gains. As of mid-March, the U.S. dollar rebounded amid growing expectations that the Fed would raise key interest rates quickly which also caused some upward pressure on U.S. bond yields.

Financial Flows into Emerging Markets at a High Level in 2004

Robust Economic Prospects for 2005

In 2004, the *emerging market economies (EMEs)* posted average economic growth of more than 7%, thus exceeding expectations in nearly all regions. This was partly attributable to robust domestic demand, stepped-up export activities and higher commodity prices. According to the IMF, economic prospects for 2005 remain robust. The IMF has revised its forecast for 2005 GDP growth in the EMEs from 5.7% to 6.3% and envisages a slightly less vibrant growth for 2006 amid a continued slowdown in inflation. Most of the risks applying to EMEs stem from the international economic environment and are identical with those relevant in industrialized countries, including the oil price risk, a possible increase in the currently low long-term interest rate level, sluggish labor market recovery, decreasing asset prices and a high exchange rate volatility.

Together with the United States, *Asian EMEs* remain the main engine of global growth. The favorable development in this region is supported by the prolonged investment boom, even though corrections occurred in the information technology markets. The consolidation of the financial sector and structural reforms of the corporate sector are still top priorities in Asian EMEs. Although selective economic policy measures were initiated a year ago in order to dampen strong economic growth in *China*, it will probably not be significantly lower in 2005 than the previous year's value of 9.5%. While interest rates have been liberalized, the exchange rate is still pegged to the U.S. dollar despite mounting international pressure – a fact that enhances the country's com-

petitiveness. Although robust economic growth is again expected for *India*, the budget deficit is likely to remain close to 10% of GDP, while the *Reserve Bank of India* will need to closely monitor the surge in short-term trade credits.

Despite the appreciation of the local currencies, average debt ratios in *Latin America* continue to be high and may be considered a potential source of risk. However, sustained high growth rates boosted by domestic demand are expected to improve the debt situation and support a better investment climate, thus improving job prospects for the rapidly growing labor potential. In the *Middle East*, progress is being made in establishing an infrastructure that helps strengthen the non-oil industries. According to the IMF, several *African countries* place emphasis on strengthening institutions and improving governance in order to reduce their vulnerability to shocks and to promote their integration in liberalized global trade.

The *Russian* economy still benefits from high oil prices; the investment climate, however, has recently deteriorated especially owing to stronger state intervention, which caused growth to subside as of the second half of 2004. As a consequence of this development, real GDP growth is expected to slow down again this year. The high level of risk in the Russian financial sector (bad loans account for 15% of total loans) contrasts with a favorable fiscal situation and high foreign reserves. In parallel to a strongly increasing current

account deficit, economic growth in *Turkey* has been surprisingly pronounced at 8% in 2004 and may come to 5% in 2005, with inflation declining further. The IMF has extended considerable financial assistance to Turkey on condition that structural reforms be promoted; owing to a lack of corporate governance and insufficient investor protection, private capital inflows are still a mere trickle.

Net Capital Inflows 2005: Slight Decline Expected After Record Level 2004

According to the IMF, *private net capital inflows* in the EMEs benefited from the global economy's dynamic growth in 2004. While *net FDI inflows* and volatile *portfolio investment* increased, the position "*Other capital flows*" (*bank loans, trade credits and derivatives*) recorded outflows. Several EMEs managed to partly finance their fiscal deficit via local capital markets. The IMF forecasts net FDI inflows to grow again in 2005, not least owing to market participants' favorable expectations of profitability in the EMEs. This year's lower net inflows in portfolio investment and the outflows recorded under "Other capital flows", which will weaken total private net capital inflows, seem to be driven by two main factors: first, the investment of the high revenues gained by oil-exporting countries, and second, the expectation that Russia will repay foreign debt ahead of schedule pursuant to an agreement with the Paris Club.

Table 1

Private Capital Flows into Emerging Markets and Developing Countries According to the IMF¹⁾

USD billion

	2002	2003	2004	2005f	2006f
Net capital flows according to the IMF	75.8	149.5	196.6	175.1	193.9
By instrument					
Direct investment	144.4	151.9	186.4	217.4	222.3
Portfolio investment	-90.0	-9.9	28.8	2.3	16.0
Other capital flows	21.4	7.5	-18.6	-44.6	-44.4
By region (number of countries)					
Latin America (31)	3.3	15.2	12.7	22.4	30.3
Europe (13)	55.3	52.0	60.6	65.8	57.7
CIS (12)	-9.5	16.4	2.9	-6.4	2.7
Middle East (14)	-4.0	-2.4	-21.0	-31.2	-25.1
Africa (47)	6.9	12.3	11.4	15.6	13.5
Asia (15)	23.9	56.1	130.1	108.9	115.0
Memorandum items					
Current account balance	142.4	233.8	336.3	395.4	345.8
Foreign reserve assets (- = increase)	-194.4	-369.3	-518.9	-523.4	-515.7
of which China	-75.7	-117.2	-206.6	-210.0	-210.0

Source: IMF (WEO).

Note: f = forecast.

¹⁾ This table shows aggregated balance-of-payments data sets of 131 nonindustrialized countries, including the major 44 EMEs. Given repeated revisions of the balances of payments, which also affect the data sets of previous years, capital flows may differ substantially afterwards.

The *Asian EMEs*, most notably China, have continued to attract the bulk of net capital inflows. A key objective and major challenge of many Asian central banks in this context is to keep inflation low while at the same time stabilizing the nominal exchange rate against the U.S. dollar. According to the IMF, reserves will further augment by more than USD 300 billion to almost USD 1,200 billion in 2005 owing to persistently large current account surpluses and speculative capital inflows and will thus cover more than 85% of annual imports. Substantial shares of these strong external inflows will be sterilized in most of these countries, thus creating costs of sterilization; in addition, a depreciation of the U.S. dollar against these currencies would result in capital losses. Even though the current account surpluses of the Asian EMEs are anticipated to shrink in 2005, China's measures to cool the economy (e.g. specifying quotas for foreign capital financing for for-

eign banks doing business on the Chinese credit market) are likely to reduce the inflows of foreign capital into the region altogether. By contrast, *European EMEs* might record growing FDI inflows in 2005, as foreign corporations choose to step up their investment in production industries with high value added given the highly qualified workforce in many of these countries. Alongside the *Middle Eastern economies*, the economies of the *Commonwealth of Independent States (CIS)* are also becoming net capital exporters, since revenues from exporting hydrocarbons are up and Russia is expected to buy back debt ahead of schedule.

Austrian Banks' Cross-Border Claims on Central and Eastern Europe – An International Comparison

At end-September 2004, the ten new EU Member States accounted for over 58% of the Austrian banking sector's total cross-border claims on EMEs

Table 2

Claims of BIS Reporting Banks on Central and Eastern Europe and Turkey as at End-September 2004**Countries of origin of the BIS reporting banks posting the highest external positions vis-à-vis the respective region**

% of GDP of the recipient country

	AT	DE	IT	FR	NL	SE	BE	UK	Europe ¹⁾	U.S.A.	Japan
CEE plus Turkey	1.9	6.5	1.3	1.1	1.0	0.8	0.8	0.7	16.1	0.7	0.4
Central European EU Member States											
Poland	1.8	x	1.5	0.7	0.8	0.3	0.5	0.3	14.4	0.3	0.6
Slovakia	5.1	x	3.4	0.9	0.4	0.0	1.9	0.1	19.9	0.5	0.3
Slovenia	5.0	x	1.7	2.0	0.4	0.0	1.1	0.3	22.8	0.1	0.5
Czech Republic	4.2	x	0.4	0.6	0.5	0.0	2.6	0.0	14.9	0.3	0.2
Hungary	4.8	x	3.2	1.9	1.0	0.0	3.6	0.9	34.6	0.4	0.7
Other CEECs											
Bulgaria	1.3	x	2.7	0.8	1.6	0.1	0.2	0.6	18.8	1.5	0.2
Croatia	8.5	x	15.5	0.7	0.4	0.0	0.4	0.8	43.9	0.7	1.2
Romania	1.1	x	1.1	1.6	1.9	0.1	0.1	0.3	13.1	0.6	0.0
Russia	0.4	x	0.2	0.7	0.9	0.0	0.1	0.0	7.2	0.5	0.3
Turkey	0.1	x	0.6	1.4	1.2	0.1	0.4	0.0	10.4	1.0	0.5

Source: BIS, Eurostat, IMF, national sources and OeNB calculations.

Note: The claims shown here correspond to the „Consolidated international claims of BIS reporting banks“ released by the BIS (BIS Quarterly Review March 2005, Table 9C). The BIS statistics cover crossborder claims denominated in all currencies as well as the claims denominated in a currency other than that of the recipient country and held by subsidiaries in the recipient country (with the exception of Austria and the U.S.A.).

¹⁾ The column „Europe“ comprises the countries of origin listed here as well as DK, GR, IE, PT, FI, ES, CH and NO.

and developing countries; Central and Eastern European countries including the CIS accounted for almost four fifths.

Leaving the German banking sector, for which no disaggregated data are available, aside, the Austrian banking sector had the highest foreign currency-denominated claims on the new Member States in CEE at end-September 2004 by international comparison, even if the foreign currency-denominated claims of Austrian banks' subsidiaries in these countries are not included.

Central and Eastern European Financial Markets Fairly Stable

Central and Eastern European Eurobonds Stand Their Ground despite Rising U.S. Interest Rates

In 2004, demand for foreign currency-denominated government bonds is-

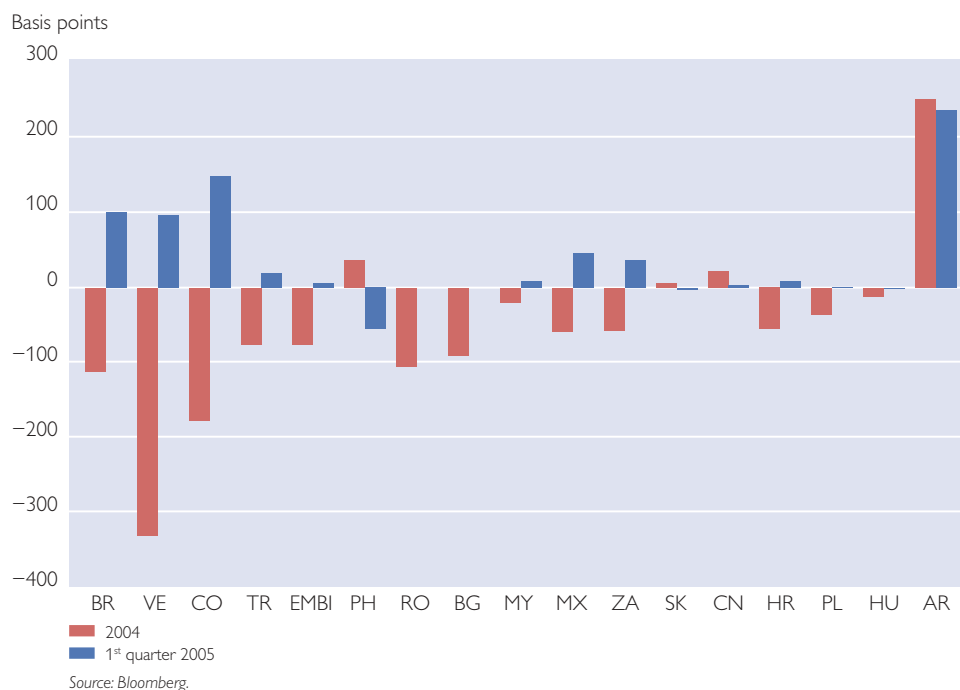
sued by emerging market issuers remained strong despite the higher level of U.S. interest rates. Between end-2003 and end-2004, the yield spreads between government bonds denominated in U.S. dollar and euro against U.S. and euro area benchmark bonds (measured by JP Morgan's EMBI Global index and Euro EMBI Global index, respectively) narrowed substantially by 56 and 74 basis points on average, which translated into total returns of almost 12% in both cases.

Key factors in the decline in yield spreads in 2004 were improved fundamentals in the emerging markets, which were also reflected in ratings upgrades, investors' continued low degree of risk aversion and the ongoing quest for higher yields in view of the relatively low U.S. and euro area interest rates.

In March 2005, yield spreads widened to an extent that exceeded the

Chart 2

Change in Euro EMBI Global Spreads (2004 and First Quarter 2005)



continued narrowing that was observed over the first two months of the year. A catch-up reaction to previous U.S. interest rate hikes and a change in the assessment of future U.S. interest rate increases seem to have been responsible for this setback, which coincided with an increase in yields on ten-year U.S. government bonds. Latin American issuers recorded a particularly pronounced widening of yield spreads.

Among the Central and Eastern European issuers, only *Romania* and *Bulgaria* posted an above-average contraction of spreads in 2004 compared to the Euro EMBI Global index, whereas in Hungary, Poland and Slovakia a contraction of this dimension was simply not possible given the low initial levels. The yield spreads of *Romanian* eurobonds shrank by 103 to 58 basis points, while those of *Bulgarian* eurobonds contracted by 89 to 44 basis points. The yield spreads of *Croatian* euro-

bonds narrowed by 54 to 42 basis points. Rating upgrades, declining deficits in the combined current and capital accounts of Bulgaria and Croatia, improved fiscal positions, the approaching EU accession date for Bulgaria and Romania and the fact that Croatia was granted the status of an EU candidate country seem to have had a positive impact on eurobonds. Spreads kept narrowing until early March 2005, when they came to 30 to 40 basis points. Owing to a global reversal of emerging market eurobond spreads, however, the yield spreads in Bulgaria, Romania and Croatia climbed by 12 to 18 basis points until end-March. This upward movement was still lower, however, than that of the Euro EMBI Global average (25 basis points) and significantly lower than that of the yield spreads of bonds issued by Latin American issuers (up to 130 basis points). Given the fact that eurobond spreads in the new EU Member States

Czech Republic, Hungary, Poland and Slovakia came to between 13 and 29 basis points in late March 2005, there seems to be relatively little leeway for further spread contractions. Investors are therefore likely to consider investing in foreign currency bonds of other Eastern European issuers if they want to continue to achieve noticeably higher nominal yields than in the euro area.

At the end of March 2005, the *Russian Federation's* eurobonds recorded a yield spread of 207 basis points (EMBI Global), whereas *Turkey's* eurobonds offered a spread of 309 basis points (EMBI Global) and 192 basis points (Euro EMBI Global), respectively, with liquidity being sufficient at the same time: Russia accounts for 13% of the EMBI Global (third-largest share), Turkey for 7.5% (fourth-largest share). Both countries look back on a relatively long, albeit sometimes rather turbulent history in the international financial markets. Since early 2004, their spreads have contracted considerably, not least owing to successful measures aimed to stabilize their economies in the past few years, which were also reflected in an upgrade of ratings. In addition, Russia's excellent foreign currency liquidity seems to support the country's government bonds. Moreover, enterprises and central, regional and local authorities both in Russia

and in Turkey issue eurobonds on a regular basis, which increases the number of possible risk/return combinations for investors. Turkey's EU candidate status to some extent acts as an anchor for future economic stability. Next to the risks that affect the entire euro-bond market and are related in part to the yield development of U.S. government bonds, there are considerable country-specific risks. In Russia, these are first and foremost connected with the oil price development, whereas in Turkey, they result from the recent heavy expansion of the current account deficit.

At the end of March 2005, *Ukrainian* eurobonds had a yield spread of some 209 basis points (EMBI Global). Now that the political situation has calmed down, the medium- to long-term perspectives seem to have improved. In early May, Standard & Poor's upgraded its rating for Ukrainian sovereign long-term foreign currency-debt to BB- from B+. In early April 2005, *Serbia* returned to the international capital market when it converted its "old debt" to the London Club group of commercial creditors into eurobonds. Prior to that, in 2004, the country had entered into a debt relief agreement with its creditors in the Paris Club and the London Club and had received a (B+) rating from Standard & Poor's in November 2004.

Table 3

Changes in Ratings of Sovereign Long-Term Foreign Currency Debt

Country	Moody's			Standard & Poor's			Fitch		
	Rating	Since	Change	Rating	Since	Change	Rating	Since	Change
Bulgaria	Ba1	17.11.04	↑	BBB-	24.06.04	↑	BBB-	04.08.04	↑
Croatia	Baa3	27.01.97		BBB	22.12.04	↑	BBB-	28.06.01	↑
Romania	Ba1	02.03.05	↑	BB+	14.09.04	↑	BBB-	17.11.04	↑
Russia	Baa3	08.10.03	↑	BBB-	31.01.05	↑	BBB-	18.11.04	↑
Turkey	B1	21.12.00		BB-	17.08.04	↑	BB-	13.01.05	↑
Ukraine	B1	10.11.03	↑	BB-	11.05.05	↑	BB-	21.01.05	↑

Source: Bloomberg.

Currency Appreciation Remains an Issue in Most CEECs

Following a depreciation of the regions' currencies against the euro in 2003 the currencies of most CEECs firmed up against the euro in 2004, with the exception of the *Slovak koruna*, which had been subject to upward pressure already in 2003, and the *Bulgarian lev*, whose exchange rate was fixed through a currency board arrangement in mid-1997. The *Polish zloty* posted the largest gain in 2004 (+15.2%), thus almost completely compensating its depreciation of 2003, which had been the strongest in the region. Similarly, the *Hungarian forint* made up about three fourths of the 2003 dip (+7.2%). The *Czech koruna* appreciated against the euro by approximately 6.5% in 2004, thus clearly rebounding from its slide in 2003, and the *Slovak koruna* continued to firm up against the euro.

These four currencies appreciated further against the euro from end-2004 onward; they came under pressure in March 2005, however, as a consequence of international investors' heightened risk aversion and of a drop in prices for higher-risk financial assets (e.g. eurobonds, corporate bonds). Still, in late March 2005, the Czech koruna's value against the euro was slightly higher than at end-2004, while the value of the Slovak koruna, the Hungarian forint and the Polish zloty remained almost unchanged.

Since Slovenia's entry into the Exchange Rate Mechanism II (ERM II), the *Slovenian tolar* has remained fairly stable against the euro and close to the central rate. As the Romanian central bank began to tolerate a greater exchange rate flexibility, the nominal depreciation trend of the *Romanian leu* came to an end in October 2004; by the end of March 2005, the Roma-

Chart 3

Exchange Rate Euro per Unit of National Currency

Dec. 31, 2000 = 100



nian currency had appreciated against the euro by roughly 12% in nominal terms. The *Croatian kuna's* exchange rate remained fairly stable, aside from the usual seasonal appreciation in summer.

Between end-April and end-December 2004, the *Russian ruble* depreciated continuously against the euro in nominal terms (but significantly less so than its reference currency, the U.S. dollar) while at the same time appreciating in real terms. In line with the U.S. dollar's appreciation against the euro in the first quarter of 2005, the ruble strengthened against the euro by about 4%. Since the beginning of February 2005, the Russian central bank's exchange rate policy has no longer been solely based on the ruble's exchange rate against the U.S. dollar but on a EUR/USD currency basket. From the beginning of February to mid-March 2005, the euro had a weight of around 13% in the basket; since then, its weight has been almost 25%.

In most cases, currency appreciations took place on the back of one of the following current account balance scenarios: the current account balance (in percent of GDP) was either negative at relatively low (or in Russia even positive) levels or negative at relatively high but declining (Bulgaria, Croatia) or broadly stable (Hungary) levels. Considerable parts of these deficits were financed through net FDI inflows; in Poland and in Bulgaria these inflows even exceeded the countries' deficits. The development in Romania was quite different, as the marked currency appreciation in the fourth quarter of 2004 and the first quarter of 2005 and the simultaneous further expansion of the trade and current account deficits at relatively high levels in 2004 (from -7.8% and -6.0% of GDP in 2003 to -9.0% and -7.5% of

GDP in 2004, respectively) pose an economic policy challenge.

In *Hungary* and *Romania* in particular, the high interest rate and yield levels in local currencies supported a currency appreciation. Capital inflows to Romania were driven up by the expected deregulation of financial account transactions effected in mid-April 2005, which permitted foreigners to hold short-term leu deposits. Part of the speculative capital seems to have reached the foreign exchange market even before the implementation of the deregulation. *Banca Națională a României* announced that it had prepared measures in coordination with the European Commission to counteract an undesirable additional currency appreciation after the deregulation. Between late 2003 and August/September 2004, yield spreads widened over the euro area in the Czech Republic and Poland as well, thus stimulating portfolio capital inflows into these countries. Thereafter, the yield spreads narrowed rapidly again and had even dropped below the level of end-2003 by end-2004.

The upward pressure on domestic currencies is in part also attributable to the increasing volume of foreign currency loans extended to domestic companies and households in several countries (Bulgaria, Hungary, Romania, Slovakia and Slovenia), as borrowers exchange the proceeds from these foreign currency loans for national currency.

In 2004 and also in early 2005, *Národná banka Slovenska* and *Banca Națională a României* intervened on the foreign exchange market by purchasing large volumes of foreign currencies to counter the appreciation pressure. The Romanian central bank's massive intervention in mid-February 2005 seems to have contributed to the stabi-

lization of the leu which had been appreciating strongly before. Since the beginning of 2004, *Hrvatska narodna banka* has purchased euro from commercial banks as well. *Česká národní banka* sold smaller euro amounts in the Czech foreign exchange market every month despite the koruna's appreciation tendency. After entering ERM II, *Banka Slovenije* intervened with small amounts in the foreign exchange market in order to signal to market participants that the policy of gradual currency depreciation had stopped.

In addition, *Národná banka Slovenska* and *Banca Națională a României* focused their interest rate policies on easing the upward pressure on their currencies: *Národná banka Slovenska* cut its key interest rate in several steps by a total of 200 basis points in 2004 and by another 100 basis points in February 2005 to the current level of 3.0%. The Romanian central bank also trimmed its key interest rate from 21.25% in mid-2004 to 14.5% in March 2005. In both countries, interest rate cuts coincided with a sharp decline in inflation, which dropped from 9.3% in December 2003 to 2.6% in February 2005 in Slovakia and from 14.1% in December 2003 to 8.9% in February 2005 in Romania. In *Hungary*, the central bank's decision to cut interest rates by a total of 425 basis points between February 2004 and March 2005 was above all based on the unexpectedly pronounced reduction in inflation (from 5.6% in December 2003 and 7.8% in May 2004 to 3.4% in February 2005). Moreover, this interest rate reduction was in line with the exchange rate policy, in particular as the exchange rate has continuously firmed up since mid-2004 and has approached the strong end of the $\pm 15\%$ currency band since early 2005. Considerations of cur-

rency strength also played a role in the interest rate cuts by *Česká národní banka* in January and March 2005 and by the Monetary Policy Council in *Poland* at the end of March 2005.

All in all, the present currency strength has a favorable effect on the decline in inflation in the countries under review. However, currency appreciation in real terms might have a negative impact on competitiveness, current accounts and, consequently, on economic growth. Whenever currency appreciations coincided with a rise in foreign debt (e.g. portfolio net investment in local currency-denominated debt securities), the sustainability of such a development remains questionable. In this context, the risk of a rapid reversal of portfolio capital accumulated over an extended period of time is a critical issue, particularly when interest rates are increasing more strongly in the U.S.A. or in the euro area. The rising proportion of foreign currency loans to domestic borrowers, and the consequent increase in banks' indirect foreign exchange risk, needs to be monitored continuously as well.

Yield Spreads of Local Currency-Denominated Government Bonds Drop against Euro Area Benchmark Bonds

In the *Czech Republic*, *Hungary* and *Poland*, the yield spreads of ten-year government bonds denominated in national currencies widened against euro area benchmark bonds up until the third quarter of 2004. According to the harmonized long-term interest rate statistics for the convergence assessment, yield spreads expanded by up to 80 basis points between December 2003 and August/September 2004, coming to 90 basis points in the Czech Republic, to 320 in Hungary and to 450 in Poland. In contrast, the spreads

of *Slovakian* government bonds remained largely unchanged over the same period at between 70 to 100 basis points. Thereafter, bond spreads started to clearly drop in all four markets and continued to fall until early March 2005, when international investors withdrew from higher-risk financial assets and bond spreads again widened moderately.

Since the end of 2003, the development of yield spreads in the *Czech Republic*, *Poland* and *Hungary* has been closely linked to the development of the countries' inflation differentials vis-à-vis the euro area. In the Czech Republic and in Poland, the inflation differential went up until August/September 2004, reaching 0.8 and 2.6 percentage points, respectively, whereas Hungary recorded a peak level of 5.4 percentage points as early as May 2004. Hence, the country had recorded a further substantial widening of yield spreads already in the first quarter of 2004, which was reversed until mid-April. The increase in the inflation differential in these countries was attributable to rising international energy prices, whose impact was stronger in the new EU Member States than in the euro area, and to adjustments of indirect taxes and of regulated prices in the course of EU accession.

Although the inflation differential in Hungary had already begun to decrease in June 2004, the yield spread of Hungarian government bonds widened again, in parallel to yield spreads of Czech and Polish government bonds, until August/September 2004. Since September 2004, inflation differentials against the euro area have decreased considerably in all three countries. In the Czech Republic and in Poland, the inflation differential contracted by 1 to 1.5 percentage points until Febru-

ary 2005 and yield spreads narrowed by approximately 100 basis points to 0 and 210 basis points, respectively. In Hungary, the inflation differential had fallen by 3 percentage points by February 2005. However, the yield spread narrowed only by 120 basis points, possibly owing to the different market perceptions of fiscal policy in these countries. In January and February 2005, the inflation rate in the Czech Republic was again below the euro area level, whereas in February 2005 it was approximately 1.5 percentage points above the euro area level in Hungary and Poland. Since end-2003, the Slovak inflation differential has continually decreased from a very high level (approximately 7.5 percentage points) to only 0.6 percentage points in February 2005.

In response to the (expected) rise in inflation, Czech and Polish yield spreads had already augmented in the first half of 2004, even before *Česká národní banka* and *Narodowy Bank Polski* reacted to the rise in inflation by raising key interest rates in the summer of 2004 – a move which, in turn, was followed by a further widening of yield spreads. Analogously, narrowing spreads anticipated the contraction of inflation differentials and the central banks' subsequent key interest rate cuts.

In 2004, budgetary developments in the Czech Republic, Poland and Slovakia were favorable for bond markets. The Czech Republic and Slovakia managed to reduce their deficits to 3.0% and 3.3% of GDP year on year, respectively, while Poland's deficit went up from 6.2% of GDP in 2003 to 6.8% in 2004 (including pension reform costs for both years), primarily as a result of EU accession. In all three countries, however, the deficit was clearly lower than announced in the conver-

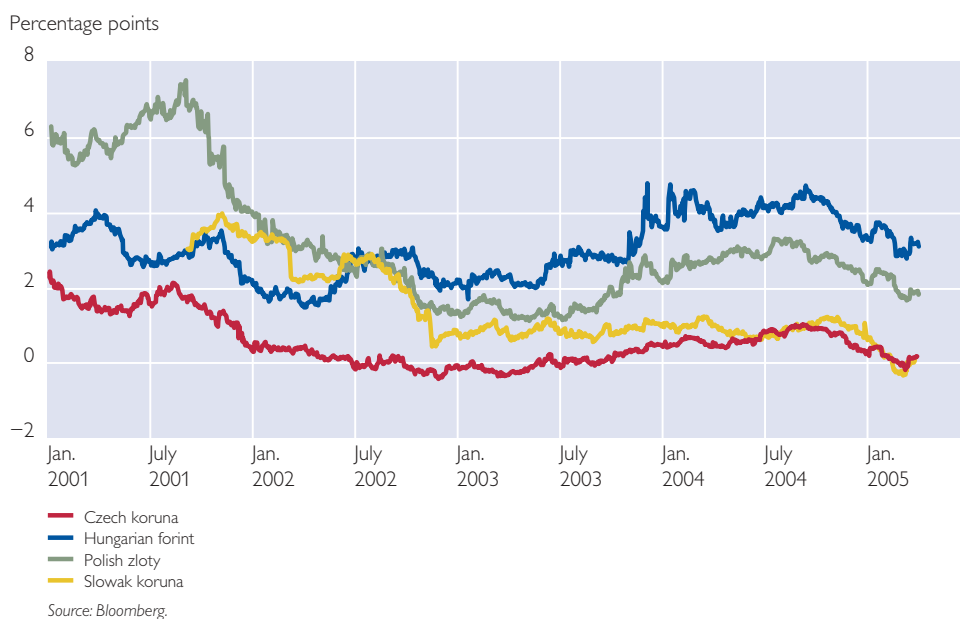
gence programs of May and December 2004 or expected by the European Commission's Autumn Forecast for 2004. In contrast, the budget outturn in Hungary was again disappointing: While the budget deficit came down from 7.1% of GDP (after data revision) in 2003 to 5.4% in 2004 (again including pension reform costs), deficit data for 2003 had to be revised upward by almost one percentage point even against the December 2004 convergence program. Moreover, even though the deficit for 2004 corresponded to the target value laid down in the December 2004 convergence program, it was clearly above the target value of 4.6% specified in the convergence program of May 2004. In addition, in January 2005 the Ecofin Council found that Hungary had taken no effective action in response to the Council recommendation of July 2004 to reduce its excessive deficit.

In March 2005, the Council issued another recommendation, inviting Hungary to take measures with a view to reducing the deficit by July 2005. In their updated convergence programs of December 2004, all four countries provided for a continuous reduction of their budget deficits over the next few years. In the Czech Republic and Slovakia, the results for 2004 were not only below the initial levels originally assumed for 2004 but also below the (even lower) target values for 2005. It is still unclear whether the deficit targets for 2005 to 2008 will be revised downward in view of the unexpectedly low deficits recorded in 2004 (with the exception of Hungary).

Between May 2004 and February 2005, market anticipations of the date for the introduction of the euro in Hungary moved from 2009 to 2010, thus drawing level with the dates expected for Poland and the Czech Re-

Chart 4

Yield Spreads against Euro Area Benchmark Bonds



public. The EU decision to increasingly – over the next five years – include the net budgetary costs resulting from pension reforms already under way in calculating the deficit used in the excessive deficit procedure might lead to a more rapid launch of fiscal consolidation measures and thus change expectations of the date of euro introduction.

Financial Position of Real Economy Sectors Strengthened

Companies Show Higher Resilience to Crises

Lively Investment in 2004

After a weak fourth quarter of 2004, the Austrian economy picked up again at the beginning of 2005, although it did feel the dampening effect of declining euro area growth. In 2004, exports, along with investments, were the main forces carrying the economy in Austria; investments in particular had reaccelerated since the third quarter of 2004 owing to a rise in capacity utilization and the related necessity to make capacity-boosting investments.² In addition, the strong investment growth in 2004 appears to have been caused essentially by a frontloading of investment prompted by the investment allowance, whose termination will most likely reduce investment activity in the course of 2005. Business survey data collected in the course of the WIFO Economic Survey also indicated a slight

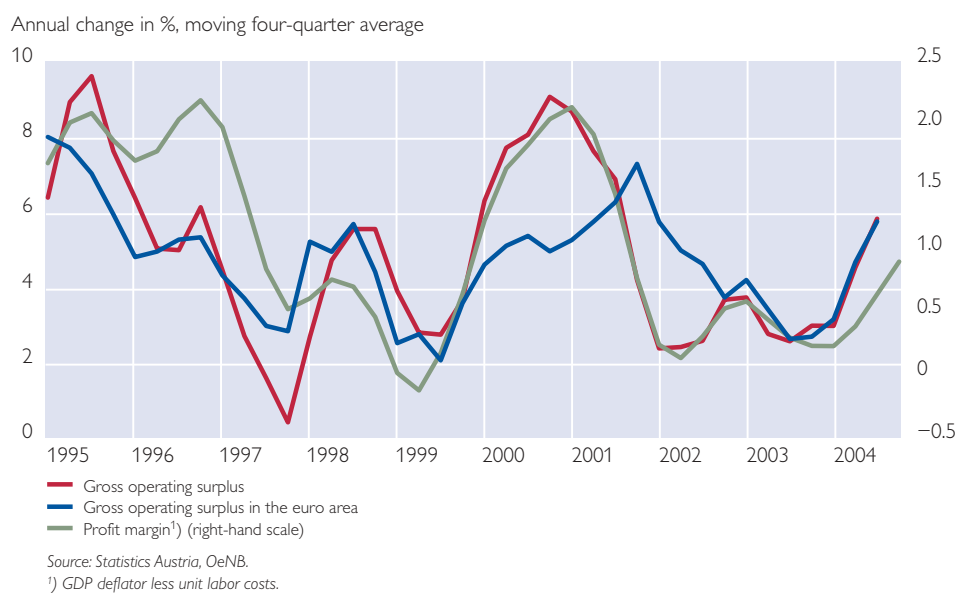
slowdown of the economic recovery, given that in spring 2005 fewer businesses said they were planning to expand their production than in autumn 2004.

Increase in Companies' Internal Financing Potential

In the second half of 2004, the corporate sector's demand for external financing did not rise to the same extent as investment, as companies were able to raise a considerable part of the required funds through internal financing. Based on the favorable development of unit labor costs, the profit situation of Austrian companies improved steadily in the course of 2004, even though climbing commodity prices made production more expensive, which resulted in lower earnings. In addition, low interest rates reduced companies' financing costs.

Chart 5

Indicators for Profitability Performance in the Corporate Sector



² Although base effects slowed down the annual growth rate in the fourth quarter of 2004, gross fixed capital formation, in seasonally adjusted terms, continued to expand fast until the end of 2004.

The development of the profit margin³ and the gross operating surplus⁴, which both showed an uptrend in the course of 2004, may serve as an indicator for companies' improved profit situation (see chart 5).

Bank Loans' Contribution to Corporate Financing Back on the Rise

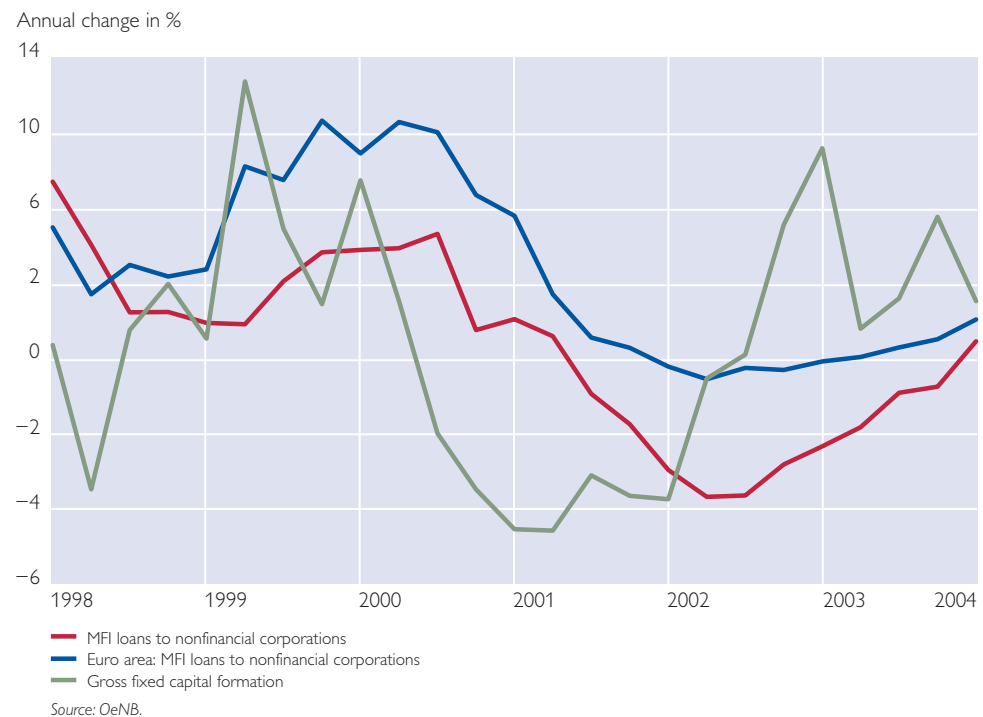
External financing advanced at a slower pace than investment spending given the corporate sector's favorable operating performance; moreover, the structure of external investment also changed in the second half of 2004.

The share of bank loans in external financing has increased considerably since mid-2004. After a decrease in borrowing in 2003, bank liabilities have shown a positive annual growth rate since mid-2004, which averaged 3.1% in the fourth quarter.⁵ Thus, credit growth in Austria remained below that of the euro area as a whole and it developed less dynamically over in 2003 and 2004 than investment spending of nonfinancial corporations.

However, there are no signs that the slow growth in lending was attributable to a reduction in credit supply.

Chart 6

MFI Loans to Companies and Corporate Investment



³ The profit margin is defined here as the relation of the gross valued added deflator to unit labor costs.

⁴ The gross operating surplus is the surplus created by corporate operations after the remuneration of labor as a production factor. It can be determined by deducting the compensation of employees and taxes on production (less subsidies) from GDP, and it is the national accounts' equivalent of gross operating income. The gross operating surplus is an approximation variable for measuring absolute profits.

⁵ Changes in the classification of the "nonfinancial corporations" and "households" sectors by a number of reporting entities resulted in a break in the relevant time series for the June 2004 reporting date. According to the available data, the resulting error amounted to EUR 2 billion for loans to households (excluding freelance professionals and nonprofit institutions serving households) in June 2004. The growth rates of loans to corporations and to households (excluding freelance professionals and nonprofit institutions serving households) have been adjusted as of the second half of 2004.

The Austrian results of the bank lending survey (BLS) for the euro area show that in recent quarters, banks only made minor changes on their credit standards. At the same time, the surveyed bank managers stated that corporate sector loan demand decreased owing to improved internal financing. The major factors affecting corporate borrowing were mergers and acquisitions, corporate restructuring and, more recently, investment financing.

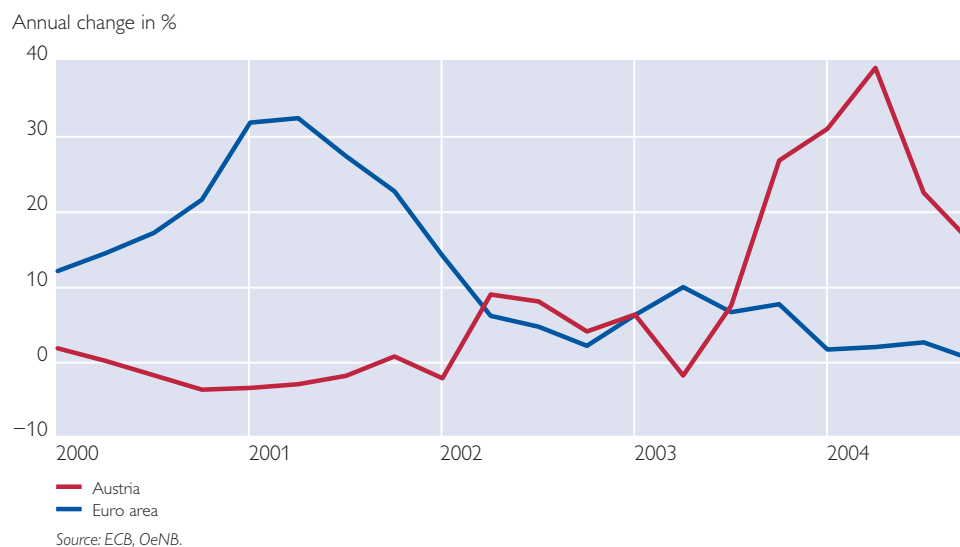
The structure of loans continued to shift toward longer maturities owing to a flattening of the yield curve and low nominal interest rates. This decline in the relative share of short-term debt in total debt may be partly attributable to the fact that the rise in acquisitions of durable capital goods drove up long-term corporate financing needs rather than the demand for short-term working capital loans. Liquidity risk tended to decrease owing to the declining share of short-term loans; since short-term assets went up at the same time, the overall corporate liqui-

dity position rose sharply in the course of 2004.

In the second half of 2004, bonds continued to play an important role in corporate finance, contributing about one quarter to the external financing of Austrian companies. Issuance statistics show that bond issues by nonfinancial corporations increased by 16% in this period year on year, while the growth rate of corporate bonds in the euro area as a whole reached its lowest value since the introduction of Economic and Monetary Union (EMU), coming to 1.6%. In contrast to the euro area, where some 15% of corporate bonds had maturities of less than one year at the end of 2004, Austrian companies did in fact not issue any short-term bonds. As bonds have longer maturities than loans and as they are usually payable at maturity, stronger bond issuance tends to reduce the liquidity burden of the corporate sector. At the same time, bonds allow issuing companies to profit from the current, relatively low interest rate

Chart 7

Outstanding Volume of Corporate Bonds



level over a longer period of time and thus to reduce interest rate risk.

Recently, raising funds on the stock exchange has become more and more important. Even though there was only one new listing on the Vienna stock exchange (Wiener Börse AG) in 2004, funds raised by nonfinancial corporations developed in a dynamical manner. Overall, raising funds on the stock exchange contributed just under 6% to the financing of gross fixed capital formation, thus showing a clear uptrend in the course of the year (see chart 8), and accounted for some 15% of external financing. In the second half of 2004, Wiener Börse AG accounted for more than 8% (in terms of volume) of capital increases and new listings of listed shares of euro area nonfinancial corporations (after 3.2% in the first half of 2004). Even though a rise in

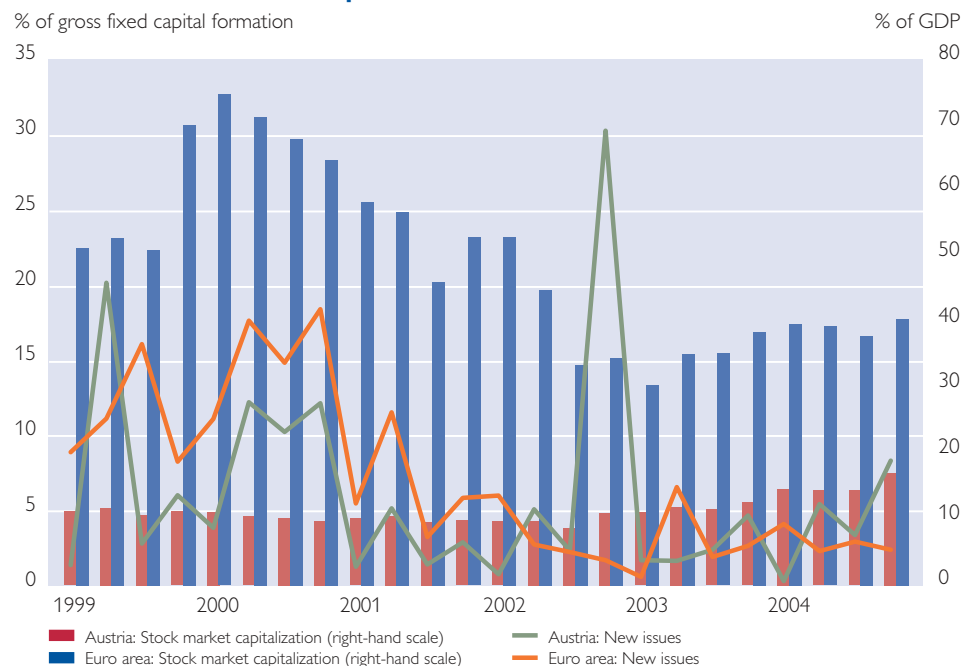
stock prices at Wiener Börse drove up the market value of issued shares by EUR 12 billion in the fourth quarter of 2004 alone, corporate sector financing through stock market listings remained below the high values registered in 1999 and 2000.

The stock market capitalization of nonfinancial corporations listed on Wiener Börse has augmented from EUR 32 billion to EUR 39 billion since mid-2004 and lately came to some 17% of GDP.⁶ This corresponds to almost half the total euro area average, which stood at 40% at the end of 2004.

Moreover, off-market equity financing went up, so that the overall share of equities in corporate sector liabilities increased considerably in 2004. On the whole, Austrian companies have thus broadened their financing base. On the one hand, they were able

Chart 8

Capital Increases, New Listings and the Market Capitalization of Listed Shares of Nonfinancial Corporations



⁶ At the end of 2004, the market capitalization of all stocks (including those of financial corporations) listed on Wiener Börse AG amounted to almost 28% of GDP.

to increasingly rely on internal financing given their favorable profitability situation, and on the other hand they made use of a broader variety of external financing instruments.

Financing Costs Remain Low

The conditions for external financing continue to be favorable for Austrian companies both for borrowing funds and for issuing equity capital.

The slight downtrend of interest rates for corporate loans observed in the first half of 2004 did not continue in the second half of the year. However, the interest rate level remained low both over time as well as vis-à-vis the euro area.⁷ In real terms, the lending

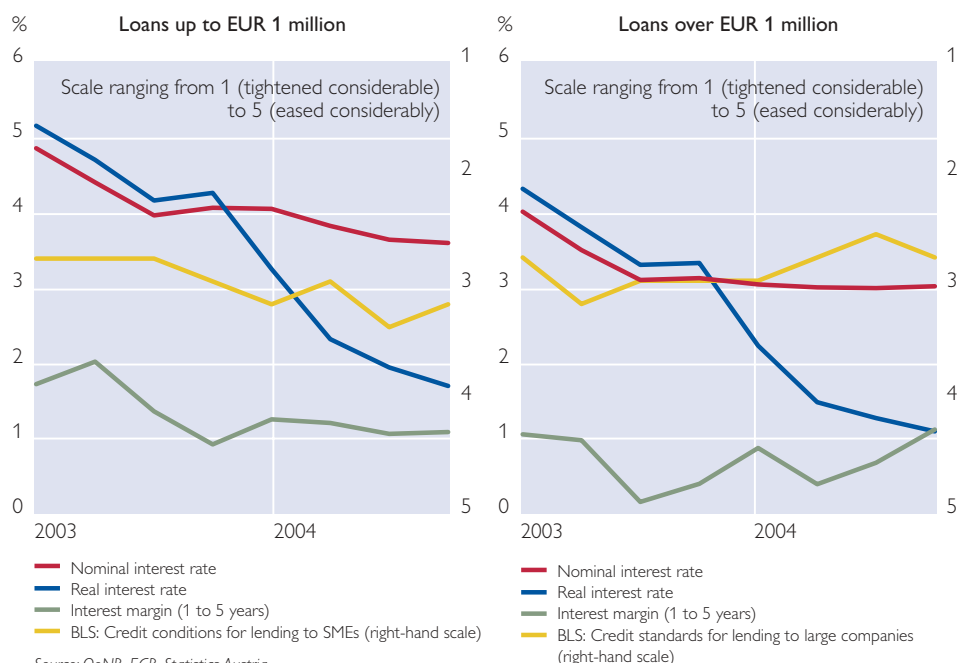
rate (interest on corporate loans less inflation⁸) was dropping throughout 2004.

A comparison of retail interest rates and those on largely risk-free assets may provide information on the risk costs contained in bank interest rates. The interest rate differential between corporate interest rates and swap rates with corresponding maturities shows that risk premiums for large financing volumes increased only slightly, while they remained practically unchanged for loans up to EUR 1 million.

This assessment of largely unchanged credit standards corresponds to the most recent bank lending survey

Chart 9

Conditions for Corporate Loans



Source: OeNB, ECB, Statistics Austria.

Note: Real interest rate: Nominal interest rate less changes in the deflator for gross fixed capital formation. Interest margin: Interest rate for loans with a maturity from 1 to 5 years less three-year swap rate. BLS credit standards: Changes in the credit standards for corporate loans over the last three months.

⁷ Data of the harmonized ECB interest rate statistics have only been provided since the January 2003 reporting date.

⁸ Deflator for gross fixed capital formation.

results. After slightly loosening their credit standards in the fourth quarter of 2004, banks did not change the basic stance of their corporate lending policy in the first quarter of 2005. However, conditions for corporate lending were tightened in some areas. Above all, banks expanded the margins on riskier corporate loans in the last two quarters, while the margins on loans to borrowers with an average credit standing remained constant.

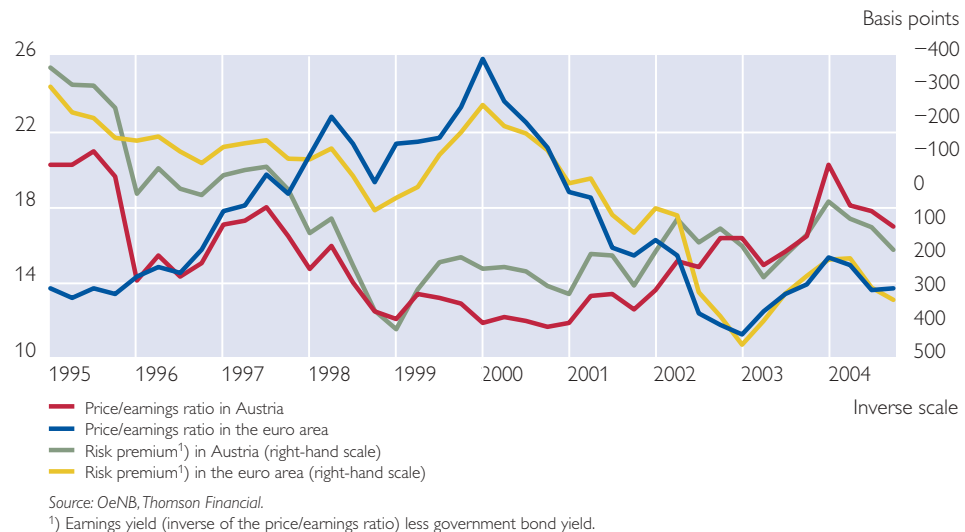
Financing conditions on the stock market have also been favorable so far. ATX performance in 2004 and in the first quarter of 2005 considerably exceeded that of important international stock indices. The price/earnings ratio has trended downward since the sec-

ond quarter of 2004, as higher stock prices coupled with an increase in corporate profits. This implies that equity financing on the stock exchange has become slightly more expensive; nevertheless, the price/earnings ratio has remained above the comparative value for the euro area as a whole.

The situation is similar for the spread between earnings yields⁹ and government bond yields whose movements over time can be seen as an indicator for the stock market risk premium. The slight increase in the yield spread in 2004 shows that the conditions for equity financing on the stock market developed somewhat less favorably than the general level of interest rates (see chart 10).

Chart 10

Financing Conditions on the Stock Market



Debt Ratio of the Corporate Sector Declines

Given the relatively moderate borrowing activity, corporate sector liabilities – relative to GDP and corporate earnings – went down slightly in the previous year (see chart 11).

The favorable earnings situation and the corporate sectors' improved capital position, however, only had a lagged effect on insolvencies. The number of insolvency proceedings dropped slightly in the first quarter of 2005, whereas no-asset cases went up by

⁹ The earnings yield is the inverse of the price/earnings ratio.

25% year on year. Expressed as a percentage of the total number of companies, the overall insolvency ratio came to 0.7%. The volume of default liabilities, which in the fourth quarter of

2004 had been one-eighth above the comparable value of the previous year, decreased by more than 20% in the first quarter of 2005.

Chart 11

Corporate Debt¹⁾



Summary

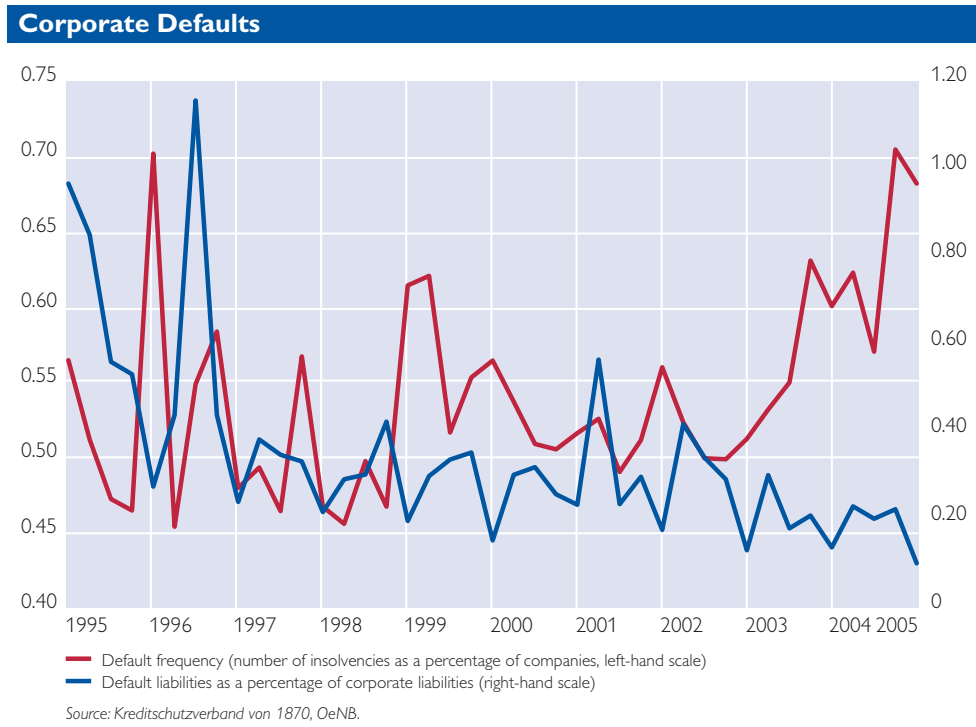
The improved financial position and the still favorable financing conditions in the financial markets suggest that the corporate sector's resilience to crises has increased over the last few quarters.

The rise in profits and equity capital has improved both the balance sheet structure and the corporate sector's credit rating. Higher profits allowed companies to increasingly rely on internal financing; moreover, they made use of a wide range of (external) financing instruments. In this respect, bank loans became more important again in companies' financing decisions in the second half of 2004.

The structure of corporate financing has shifted toward longer-term forms of borrowing. The higher proportion of equity financing and the increased recourse to bonds as well as the tendency toward longer-maturity bank loans have contributed to this development. This means that while the corporate sector is now exposed to a lower liquidity risk, it cannot take full advantage of the lower financing costs caused by low interest rates.

All in all, the corporate sector has improved its robustness to shocks. At the same time, the increased use of capital market instruments has spread corporate risk, which was covered primarily by the banking sector in the past,

Chart 12



more broadly across the financial markets.

However, some risks still remain: Even though corporate profits were very high in 2004, economic growth forecasts are cautious, which means that companies' internal financing potential might decrease. Moreover, the cost savings caused by the currently low level of interest rates for corporate lending might partly be reversed if interest rates go up markedly. However, many companies have lately reduced their vulnerability to interest rate changes by raising funds through the issuance of bonds and shares.

Households' Financial Investment and Debt on the Rise

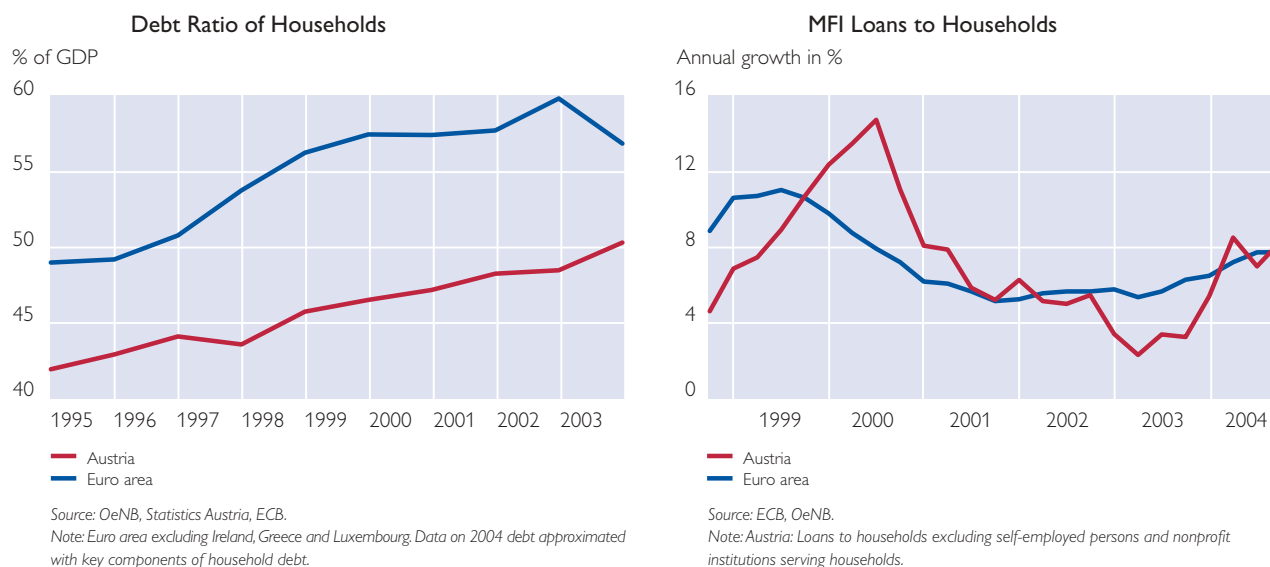
Only Slight Income Growth in 2004

In 2004, household income improved only marginally. Disposable income went up by 1.7% in real terms, at the

same rate as in 2003. Despite the subdued increase in income, households began to spend more for private consumption. Going up by 1.5% in real terms, private consumption growth more than doubled compared to 2003, which implies that a substantial proportion of income growth was spent for consumption. At the same time the saving ratio climbed from 8.9% to 9.3%. According to the OeNB's economic outlook for Austria, household income should augment in 2005. Disposable income is expected to increase by 2.0% in real terms owing to positive effects of the tax reform and the sustained rise in employment. The saving ratio should come to 9.7%. The uptrend in the saving ratio in recent years is partly ascribable to redistributions of employees' net personal incomes, which have a low saving ratio, to the profits of self-employed persons.¹⁰ In households' financial

¹⁰ See WIFO Forecast April 2005.

Indicators for Households' Debt



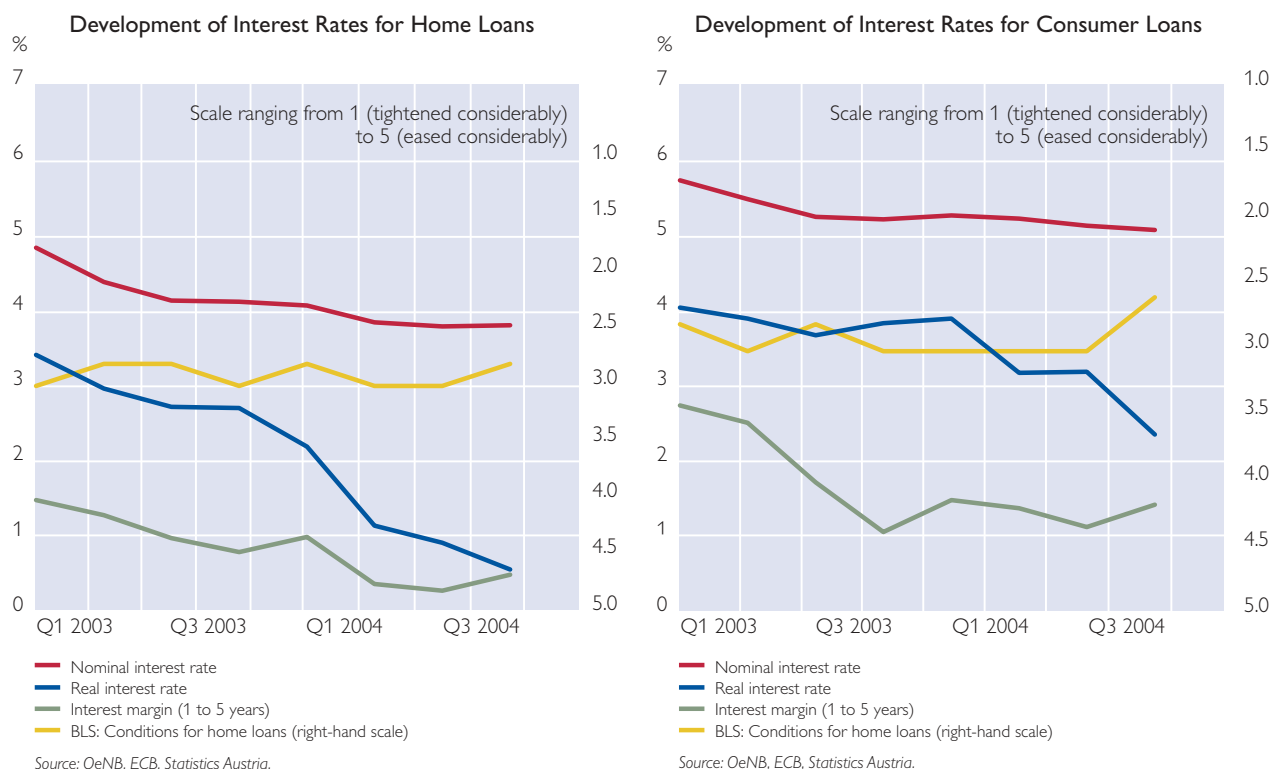
flows, this development is reflected in the strong recent rise in financial assets, which is accompanied by high debt.

Debt Continues to Rise

The debt ratio of Austrian households increased further in 2004. Liabilities came to around one half of GDP; at 57%, however, they were below the euro area reference value (see chart 13). In a comparison of euro area countries, Austria (along with Italy and Finland) ranks in the lower range in terms of household debt.

According to financial account data, households took out loans to the amount of EUR 7.7 billion. This corresponds to an annual growth of 7.0%. Home loans (EUR 5.0 billion) accounted for the bulk of borrowings while consumer credits amounted to EUR 1.3 billion. In general, the rise in debt is somewhat problematic within the current macroeconomic framework. Given the currently rather moderate income growth, consumer loans, above all, are becoming riskier as no collateral is provided should the debtor turn insolvent (contrary to home loans, where real estate can be used as collateral).

Conditions for Loans to Households



Note: Real interest rate: Nominal interest rate less changes in the deflator for construction investment and consumer spending. Interest margin: Interest rate for loans with a maturity from 1 to 5 years less three-year swap rate. BLS credit standards: Changes in the credit standards for lending to households over the last three months.

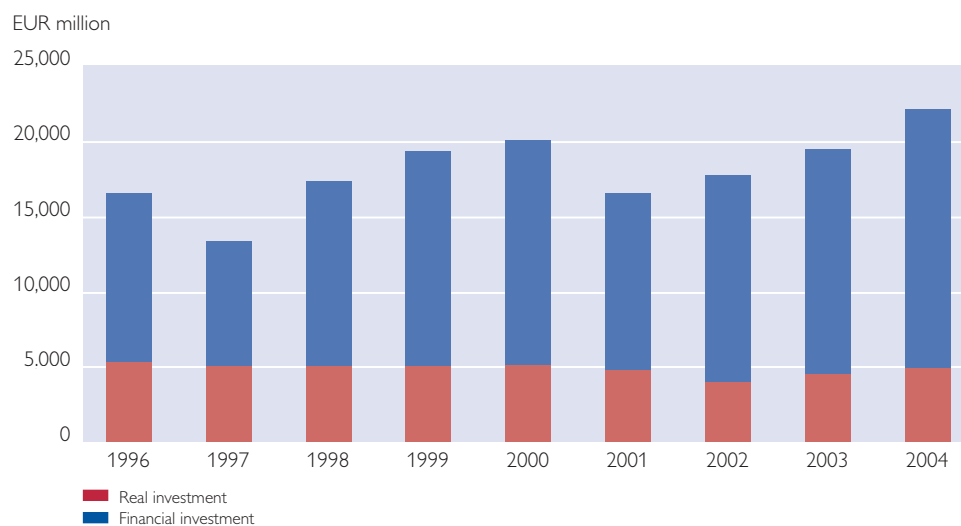
Further Improvement of Financing Conditions in the Second Half of 2004

In the second half of 2004, financing conditions for housing and consumer loans improved further. Interest rates for new housing loans decreased by 60 basis points to 0.49% in real terms, while real interest rates for consumer credits went down from 3.22% to 2.41%. In the second half of 2004, banks' interest margins expanded slightly for mid-term consumer and housing loans, which might indicate that the banking sector expects loans to become riskier. The results of the

bank lending survey also indicate a slight tightening of credit standards for the fourth quarter of 2004 (see chart 14). In general, the low interest rate level contributes substantially to reducing the burden on private borrowers. At the same time, however, the favorable interest rates entail certain risks. Households might not sufficiently take into account the future financial burden that might arise from higher interest rates, which would result in a deterioration of credit quality.¹¹

¹¹ Variable interest rates dominate the credit market in Austria. It is not possible, however, to break down the respective types of loans - at fixed or variable interest rates - and assign them to the individual economic sectors.

Chart 15

Households' Real and Financial Investment

Source: Statistics Austria, OeNB.

Note: Real investment according to national accounts. Values estimated for 2004.

Continued Acceleration of Wealth Accumulation in 2004

Households continued to step up wealth accumulation substantially in 2004. In total, households' real and financial investment appears to have expanded by EUR 21.9 billion (see chart 15).¹²

In real investment considerable funds seem to have flown into new housing.¹³ Indicators for this assumption are the strong demand for housing loans on the one hand and an uptrend in prices for new apartments observable since mid-2004 on the other.

After decreasing by 1.5% year on year in the first half of 2004, residential property prices remained unchanged

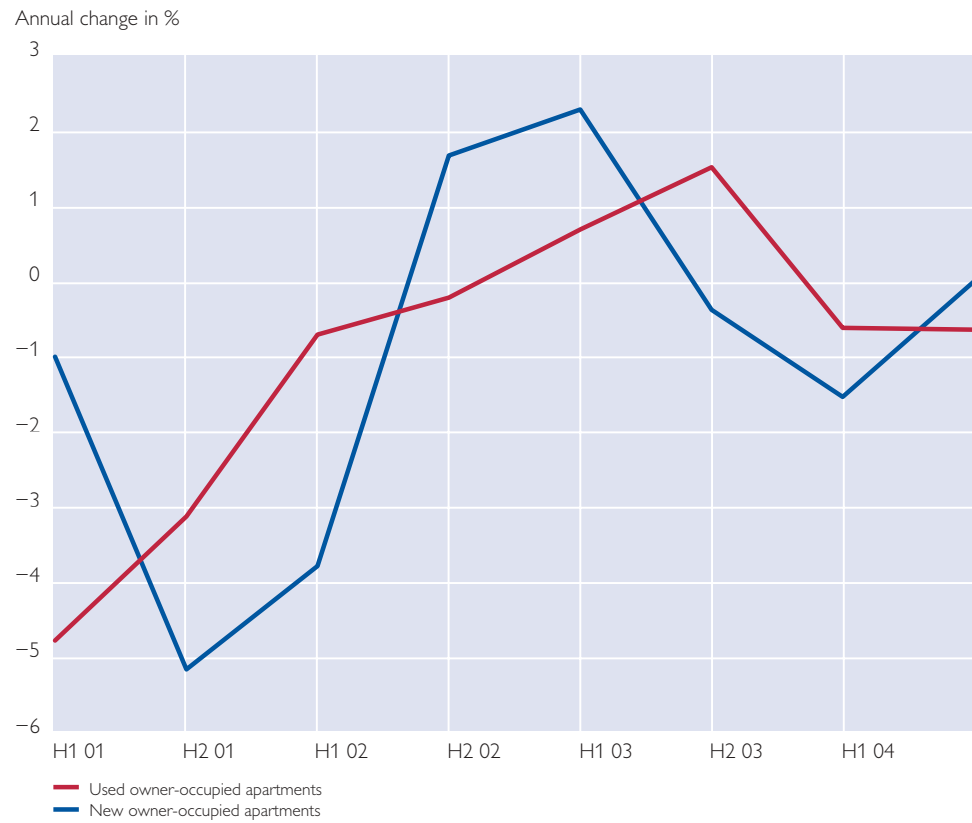
at the end of 2004. These price developments might be a result of lower excess supply. Thus, residential property prices continue to remain below the long-term average. The prices for used owner-occupied apartments dropped only slightly by 0.6% in 2004 (see chart 16).

Financial investment came to EUR 17.2 billion in 2004. The preference for liquid assets declined slightly against previous years. After having accounted for more than half of financial investment in 2002 and 2003, currency and deposits amounted to EUR 6 billion in the reporting year, i.e. around one third of financial investment. This indicates a trend toward normalization in

¹² This is a first estimate. Statistics Austria will release data on households' real investment for 2004 in December 2005. Real investment is estimated via households' saving and net lending/net borrowing in the capital account.

¹³ Around half of households' real investment was housing-related investment. Investment by self-employed persons, who are statistically classified under the "households" sector, also contributed considerably to real investment.

Real Estate Prices in Austria



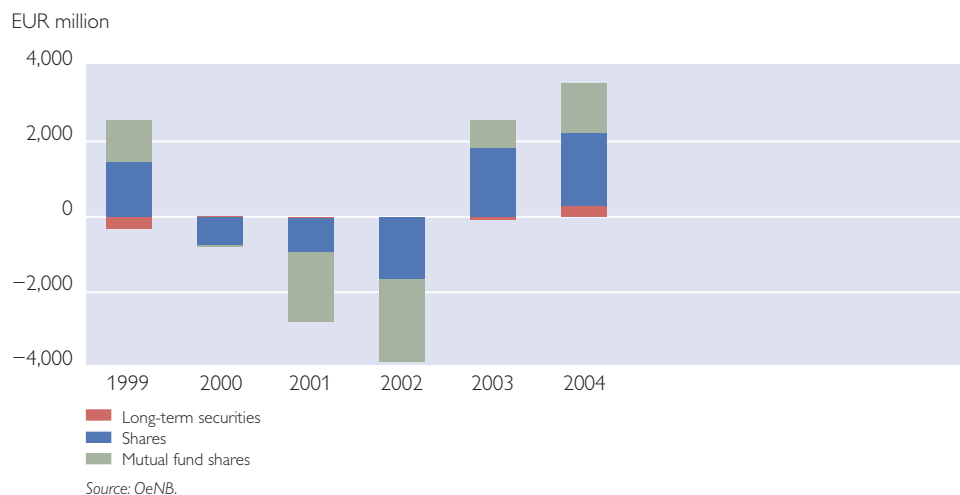
holding cash. The demand for insurance products went up. The volume of life insurance reserves and the investment in pension funds expanded by EUR 4.8 billion. After interest in mutual fund shares had slowed down in previous years, mutual fund shares picked up again in 2004, with investment amounting to EUR 2.9 billion. The high volumes invested in insurance products and mutual funds in particular in recent quarters are attributable on the one hand to the increase in households' private pension savings and on the other to the demand for foreign currency loans.¹⁴

Financial investment was supported by the price development on the national and international securities markets (see chart 17). Amounting to EUR 3.5 billion, price gains accounted for some 17% of the overall growth of financial assets. More than half of the valuation changes was attributable to price gains of EUR 1.9 billion in shares, while positive price changes for mutual fund shares came to EUR 1.3 billion. In combination with price gains of EUR 2.6 billion in 2003, households were thus able to largely compensate their capital losses they incurred between 2000 and 2002. According

¹⁴ Life insurance reserves along with mutual funds act as repayment instruments for foreign currency loans. Households' continuously rising demand for foreign currency loans thus entails positive effects on financial investment through life insurance reserves and mutual fund shares.

Chart 17

Valuation Gains and Losses in the Financial Assets of Households



to surveys, however, only very few Austrian households hold stocks; this means that the related price risks are of minor importance for the overall household sector. For mutual fund

shares the situation is different: These are highest in demand in particular with households of average wealth, as their diversified portfolio keeps the investment risk reduced.

Methodological Questions on Financial Assets

of Austrian Households

The analysis of the financial position of households presented in the OeNB's Financial Stability Report essentially relies on financial accounts data. The financial accounts statistics provide details on the development of all economic sectors (households, nonfinancial corporations, general government) since 1998, but do not contain any information on important economic issues such as the personal distribution of assets. As a consequence, these macrostatistical data do not show whether the Austrians are accumulating more wealth; neither do they provide sufficient information on the average financial assets of Austrian households, as the financial assets of nonprofit institutions serving households (such as the church or the Austrian Trade Union Federation), of freelance professionals and of private foundations are assigned to the households sector in the financial accounts. Thus, a substantial increase in the financial assets of private foundations might conceal opposing developments at the household level.

Asset growth may be attributable to savings, inheritances or capital gains. Some of these factors rather depend on individual behavior (saving), while others are rather exposed to externalities (inheritances, capital gains). Altogether, they may cause financial assets to grow or decline.

The composition of households' portfolios is of particular interest for financial stability. It is important to know how profit- or risk-oriented investors are and how a rise in households' debt would be distributed across the individual subsectors. Another question is whether those households that are indebted are identical with those that have acquired assets. The macrostatistical data contained in the financial accounts do not suffice to answer these questions. In fact, finding an answer requires a solid microstatistical basis. Above all, given the great variety of factors that influence the accumulation of financial assets, compiling data at the micro level may be advisable. Micro-level data will also be indispensable when it comes to economic policy issues such as determining whether the Austrians are equipped to meet the challenges of private pension plans.

A number of central banks, such as Banca d'Italia, Banco de España and the Fed, conduct regular surveys on the financial wealth of households. Presently, the OeNB is also conducting a nationwide survey among households. The objective of this survey is to assess the composition of households' financial assets in order to identify characteristics of financial behavior and to examine the changes in asset distribution in recent years. The results of the current survey will be presented in one of the future issues of the Financial Stability Report.

Significant Rise in Private Bankruptcies

High household debt goes hand in hand with a rising number of private bankruptcies. The Kreditschutzverband von 1870 reports that the overall number of households' defaults rose by one quarter to 5,573 cases in 2004.¹⁵ In the first quarter of 2005, the number of private bankruptcies came to 1,582, which corresponds to an annual growth of 13.7%. In line with increasing excessive debt, default liabilities peaked at around EUR 700 million in 2004.

There was a significant rise in the number of no-asset cases, which aug-

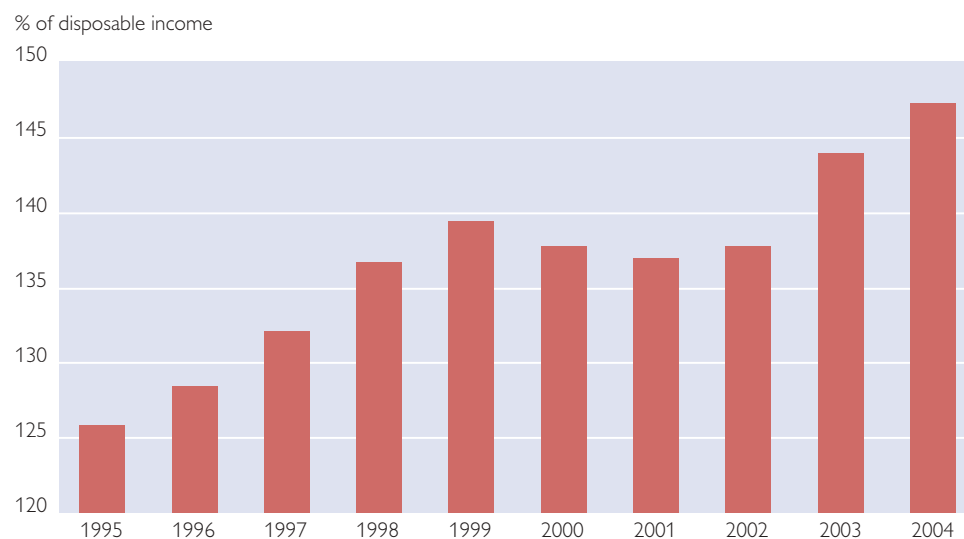
mented by around one third and reached 903 cases in 2004. In the first quarter of 2005, 304 bankruptcy filings were denied – a 40.1% increase year on year. In other words, the number of households unable to repay their debt is going up.

Financial Assets Increase Considerably while Credit Demand Accelerates

Estimates of households' financial situation vary. In 2004, financial asset growth and net financial assets reached the highest value since the introduction of financial accounts statistics in 1995 (see chart 18). This

Chart 18

Net Financial Assets of Households



¹⁵ According to the Kreditschutzverband, this increase is partly attributable to a change in the legal framework for private bankruptcies in 2002. The access criteria for private bankruptcy proceedings were loosened; while previously a discharge of residual debt had to be guaranteed, the new amendment only prescribes that procedural costs must be covered.

development strengthens the resilience to shocks.

In parallel, households' debt continues to increase. The fact that the incomes of employees and self-employed persons grow at very different speeds indicates that access to financial investment options has been highly disproportional in recent years – a fact which has contributed to a further concentration of assets in Austria. Both stabilizing consumption and investing in real estate thus depend on higher indebted-

ness, which generally means higher insolvency risks. Home loans, in particular, have been accelerating recently. Debt financing, which is high for real estate purchases, benefits from the low interest rate level which also helps reduce borrowing costs. In this context, it would be desirable, however, that households – in the long run – take into account possible future interest rate hikes that might excessively strain their budgets and thus drive up their default risk.

Austrian Financial Intermediaries in Good Shape

Stability of Banking System Further Strengthened Impressive Performance by Austrian Banks

Total Assets Continue Surging

Since 2003, the unconsolidated total assets of the entire Austrian banking sector have risen almost steadily, peaking at EUR 658.7 billion in January 2005. Compared with the previous year, this represents strong growth of 8.0%. The ten largest banks (excluding special purpose banks) posted growth of 6.8%, thereby accounting for 52.0% of total banking assets. What is striking is that, above all, state mortgage banks, Volksbanken and special purpose banks recorded above-average growth of 19.0%, 12.7% and 12.3%, respectively.

Foreign business, the assets and liabilities sides of which strengthened by 14.2% and 9.3% respectively in January 2005, remains crucially important for the growth of total banking assets. In this connection, the expansion of Austrian banks in Central and Eastern Europe should be highlighted. Loans posted a year-on-year increase of 5.3%, with foreign currency loans, in particular, still basking on a wave of popularity. On the liabilities side, domestic interbank liabilities (+8.0%) and increasing domestic issues (+9.7%) drove the growth of total banking assets. By contrast, domestic nonbank deposits grew by 5.4%, thereby falling short of total asset growth.

In 2004, the number of banking offices continued to drop, standing at 882 head offices (of which 28 foreign banks) and 4,366 branch offices in December 2004. Overall, banking office

numbers were down by 49 (14 head and 35 branch offices), with the Raiffeisen and savings bank sector primarily contributing to this development. In addition, full-time equivalent (FTE) employment¹⁶ in the Austrian banking sector as a whole contracted by 3.0% in 2004 (December 2004: 65,421). The ten largest banks accounted for 21,538 or 32.9% of FTE employment in the banking industry. The median¹⁷ was 21, thus mirroring the high share of banks with low FTE employment.

Derivatives Business Continues to Contract

Since April 2004, the nominal value of special off-balance sheet financial transactions pursuant to § 22, Annex 2, Austrian Banking Act (derivatives business) has been going down steadily, amounting to EUR 1,432.6 billion in January 2005. This is 36.4% less year on year and is thus only 2.2 times as high as the total assets of all Austrian banks (January 2004: 3.7). This decline can be traced back to, in particular, the change in business activity of a single major Austrian bank. If one disregards this particular bank's volume, Austrian banks' derivatives business can be said to have experienced modest growth of 2.4%. Overall, interest rate contracts still account for the lion's share (83.1%) of derivatives business, followed by exchange rate and gold contracts (16.2%).

By contrast, off-balance sheet transactions pursuant to § 22, Annex 1, Austrian Banking Act (sureties, guarantees, outstanding loan commitments, etc.) have increased. In February 2005, these transactions, broken down

¹⁶ For instance, two part-time employees working 50% of a full-time employee correspond to one FTE employee.

¹⁷ The median is the midway value, under and above which an equal number of values lie. Special purpose banks are disregarded for the calculation of the median.

by risk into the categories of high, medium, below-average and low credit risk, amounted to EUR 134.9 billion (+9.1% year on year), accounting for about 20% of total banking assets. Most transactions (equivalent to EUR 66.7 billion) carried a low credit risk; followed by those with a medium credit risk (amounting to EUR 35.8 billion), followed by transactions with a high credit risk (amounting to EUR 29.8 billion) and, finally, those with a below-average risk (amounting to EUR 2.6 billion or 2.0%).

Austrian Banks' Profit Growth Continues Accelerating in 2004

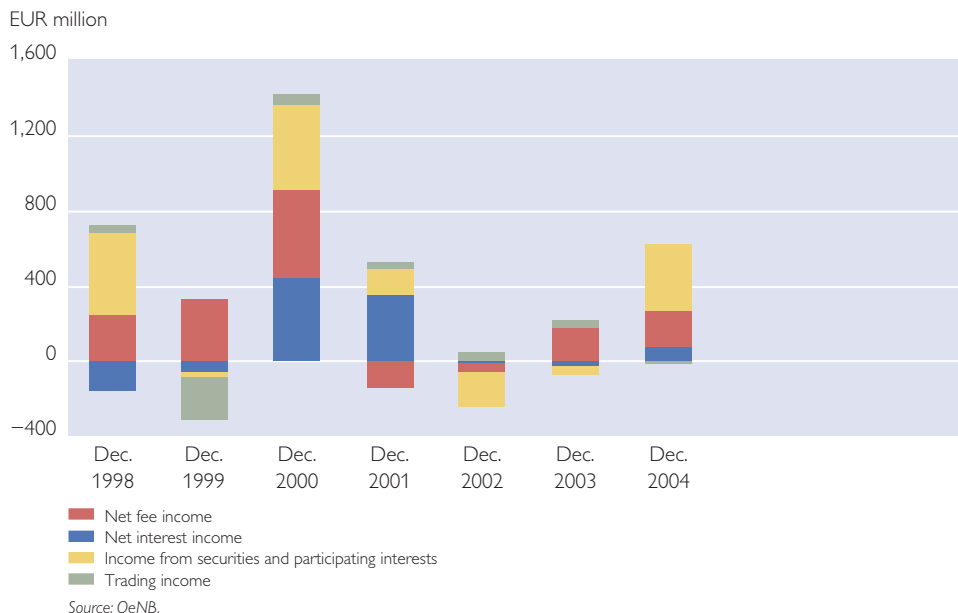
In 2004, profits generated by Austrian banks continued to rise. Although Austrian banking subsidiaries in Central and Eastern Europe made a key contri-

bution to this development, domestic business also posted strong profit growth.

In 2004, unconsolidated operating profits grew by 7.6% (2003: +4.5%). The continued improvement in domestic operating banking business is attributable to the fact that, since early 2003, income has been growing faster than costs. In 2004, operating income and operating expenses were up by 4.3% and 2.7% respectively, year on year. At 67.2%, the cost/income ratio for 2004 was the second best ever at year-end since 1997. The cost/income ratio has been lower only in 2000 (66.6%), primarily owing to high income at the time. By contrast, the reasons for these latest improvements can be found on both cost and income front.

Chart 19

Annual Growth of Income Components



In 2004, income from participating interests and fee-based income made a major contribution to income growth (see chart 19). Income from securities and participating interests rose by 20.7%, largely thanks to dividend

payments by foreign affiliates. Fee-based income increased by 6.2%, with, above all, net fee income from securities transactions posting robust growth. Interest income edged up slightly by 1%, and trading income

deteriorated by 1.7%. As chart 20 shows, the rise in net interest income was driven by growth in volume, as the interest margin¹⁸ continued narrowing from 1.27% in 2003 to 1.21% in 2004¹⁹ (end-2001: 1.34%). The ECB's interest rate statistics also confirm the continuing trend in narrowing interest margins. Lending rates on the entire range of outstanding loans are largely dropping, whereas deposit rates are largely rising. Compared with

the euro area, consumer lending rates are nowhere more favorable than in Austria, and corporate lending rates also rank among the lowest. On the deposit front, interest rates offered in Austria are in the top third of the euro area. All in all, this means Austria has the euro area's second-lowest interest margin between loans and deposits, according to the ECB's interest rate statistics.

Chart 20

Annual Change in Net Interest Income and Interest Margin



Interest income is becoming less important for Austrian banks. Only 49% of operating income is generated by interest-based business (1995: 61%). By contrast, income from fee-based business and from participating interests is growing in importance: 23% of income is generated by fee-based business and 14% by participating interests. At the end of 2004, the share of trading income remained low (4%).

In early 1997, by contrast, it was twice as high (8%). A comparison shows that the higher the contribution of individual categories' income is, the less volatile their growth rates have been, which can be judged positively from the perspective of financial stability. In other words, interest earnings may have lower margins but are a reliable income component for Austrian banks in an unfavorable market environment.

¹⁸ This analysis is based on the ECB's method, which takes account of differing credit and deposit volumes, but does not reflect different credit and deposit maturity structures. Further details can be found in ECB (2000) "EU banks' margins and credit standards," Frankfurt am Main.

¹⁹ A seemingly small change in the interest margin has a significant impact on profits: At the end of 2004, for instance, a 0.1% percentage point lower interest margin would trigger a decline of 8.3% in net interest income.

At 2.7%, the annual growth in operating expenses is primarily attributable to the increase in staff costs. Whereas administrative expenses remained constant on a year-on-year basis, staff costs rose by 2.5%. In view of reduced employment (measured in FTE) and increased income, the rise in staff costs is likely to be due to profit-related wage components. In addition, staff costs have become more flexible in the last few years. Compared with the EU, however, some leeway still remains as regards staff costs.

In addition to improved operating business, the burden from both credit risk and securities risk also weakened in 2004. Expected net credit risk provisions contracted 8% year on year. Anticipated net loss provisions for both securities and participating interests even boosted profits by EUR 560 million. This is largely due to a one-off effect from increasing hidden reserves for participating interests. In 2003, this item only added EUR 46 million to the operating profits of Austrian banks.

Taken together, this generates profits on ordinary activities, which were up 35% year on year. Including extraordinary income and tax, annual net profits grew by 44% to EUR 2.98 billion, with the above-mentioned one-off effect significantly contributing to this rise. At 0.47%, ROA²⁰ in 2004 was much higher than in the previous year (0.35%), thereby matching its peak in 2001.

Consolidated Profits Reflect Business Activity in Central and Eastern Europe

The uptrend in unconsolidated profits is mirrored by consolidated profits, which benefited above all from the business activity of Austrian banks in

Central and Eastern Europe. On a consolidated basis, net interest income rose by 13.3% year on year (including income from securities and participating interests), while fee-based income increased by 15.9%. In contrast, trading income fell by 3.7% from the high level recorded in 2003. In relation to total assets (which grew by 12.8% in 2004) operating profits stood at 2.6%, same as in 2003.

The expansionist activities of Austrian banks in Central and Eastern Europe are also reflected in the growth in costs. Overall costs rose by 10.9%, with staff costs increasing by 7.5%, administrative costs rising by 12.8% and write-downs jumping by 19%. At the same time, operating expenses as a ratio of total assets remained more or less unchanged from 2003. Including risk provisions – which also reflect the above-mentioned one-off valuation effects from individual Austrian banks' participations – and tax, Austrian banks' consolidated annual profits jumped by close to 50% to more than EUR 3.7 billion in 2004. ROA for the banking industry as a whole thus reached 0.6% in 2004.

Despite robust growth in profits and contributions from business in Central and Eastern Europe, Austrian banks are still not very profitable compared with their EU peers. This is primarily due to fierce competition inducing relatively low interest margins. At the same time, low-margin interest earnings also account for a comparatively high share of income. The contribution of income from fee-based business is small by euro area standards. As already mentioned, however, it is becoming an increasingly important income component for Austrian banks.

²⁰ Annual net profit relative to average total assets.

Chart 21



Loans Expand As Loan Loss Provisions Decline Slightly

Steady Growth in Bank Lending

Compared with 2003, when bank lending trends were sluggish owing to a lackluster economic environment, domestic loans in Austria soared throughout 2004. In the second half of 2004 as well, growth in Austrian bank lending was higher than in previous periods. At the end of 2004, the annual loan growth of all Austrian banks amounted to 5.1% (see chart 21). By contrast, it was only 1.6% at the end of 2003. In addition, preliminary figures for 2005 indicate further annual growth (January 2005: 5.3%).

Compared with previous periods, moreover, it is striking that the loan growth of Austria's ten largest banks

(in terms of total assets) also accelerated sharply, outperforming in the second half of 2004 growth in the median value of all Austrian banks for the first time since 2002. In January 2005, annual loan growth generated by the big ten was 5.8%. However, this group's steep loan growth in fall 2004 can be traced back to the lending of a single major Austrian bank, in particular. The median value for lending exhibits a comparatively steady growth. In the second half of the year, it hovered around 4%, which it reached in January 2005 as well.

All in all, lending therefore increased in an economically more benign climate and against a backdrop of favorable interest rate developments.

A breakdown by banking sector shows that, in particular, Volksbanken, state mortgage banks and the Raiffeisen sector all posted robust annual loan growth of around 7%. The joint stock bank sector, where lending even dropped from August to November²¹ 2004, posted a poor performance, as did the building and loan association sector, which had already reported a rather muted financing performance in previous periods.

An analysis of loan growth by economic sectors shows that corporate lending continued to accelerate compared with previous years. In December 2004, annual corporate loan growth was 2.7%.²² This corresponds to the more buoyant investment activity of Austrian enterprises in the second half of 2004.

Furthermore, household lending staged a recovery. At the end of 2004, annual household loan growth was 8.4%. A comparison of total household lending by lending purpose shows that the share of home loans as a percentage of total loans increased to the detriment of consumer loans. Since September 2004, home loans have accounted for more than 60% of total household loans. In early 2005, consumer loans accounted for some 30% of total household loans.

Likewise, loans to nonbank financial intermediaries grew sharply on a year-on-year basis. In January 2005, annual growth was 11.4% (2004: 7.1%). By contrast, loans to general government grew at a below-average rate, posting annual growth of only 2.7% in January 2005.

²¹ Since Bank Austria's reclassification to a new sector in the reporting system in December 2004, only data to November 2004 can be used for the time being.

²² Data on loans to households and nonfinancial corporations are inclusive of foreign currency loans. Since the relevant repayment vehicle and thus accompanying "hypothetical" loan repayment rates cannot be included for technical reasons, the numbers are maxima.

Alternative Corporate Financing

The last few years have seen numerous initiatives by economic policy actors and banks to promote and propagate alternative financing instruments for enterprises – in particular, small and medium-sized enterprises (SMEs). The recent period has also seen academic studies and surveys published on the importance and potential of alternative forms of financing in Austria. Their results²³ are presented below by way of a brief description and explanation of the individual financing instruments.

According to a survey²⁴ on medium-sized enterprises, **leasing financing** is the most frequent source of financing used by enterprises after traditional bank loans: about 45% of respondents said they used leasing. From a financing perspective, the rental or leasing of movable or immovable economic goods has the advantage of both improving the balance sheet structure and committing less capital, thereby facilitating greater flexibility in planning investments.

Apart from leasing financing and subsidized financing (e.g. subsidized export financing), other alternative forms of financing are currently only of minor importance for raising funds. Only 6% of respondents said they used mezzanine financing, widely promoted by financial institutions and development agencies. **Mezzanine capital** is a hybrid of equity and debt capital in three ways. First, it pays interest and is to be repaid like a loan. Second, it offers the provider of capital the possibility of participating in the enterprise value, and, third, it represents subordinate capital compared to the other debt capital components. As a rule, repayment and interest of mezzanine loans depend on growth in both cash flow and profits generated by the enterprise, thereby facilitating greater financial flexibility. Moreover, collateral is not generally required. However, interest rates on mezzanine financing are, for the most part, much higher than on traditional bank loans, and market norms require a minimum financing amount of EUR 500,000. A similarly hybrid form of financing are **dividend warrants**, for which funds with a minimum maturity of ten years are provided by several investors to an enterprise requiring capital. In addition, **factoring** and **forfeiting**, which are used by a mere 1% of respondents, are currently forms of financing that both have – at best – future potential. In the case of these two instruments, enterprises sell part of their assets at a discount mainly to banks or specialist financial institutions. As a rule, the latter assume the economic risk since the seller is not liable for the servicing of the debt. In addition to an inflow of liquidity and a freeing up of funds, enterprises using this form of financing therefore also benefit from the transfer of risk. However, this instrument is hardly used – a fact that is probably due to the high costs of factoring and forfeiting.

In the case of **asset-backed securitization** (ABS), bonds backed by a pool of assets (e.g. trade receivables, loans or bonds) are issued. In this way, hitherto illiquid assets are converted into instruments that can be traded in financial markets. As with factoring and forfeiting, the advantages of ABS are the freeing up of funds and rapid injections of liquidity. However, the minimum total financing amount of an ABS transaction is EUR 20 million under current market conditions.

Within the framework of capital market financing, the last few years have increasingly seen, in addition to traditional bonds and equity issues, instruments designed to open up access to capital markets for SMEs as well. The key forms of financing in this area are venture capital and private equity. **Venture capital** (VC) is primarily used for financing early stages of innovative start-ups. The provider of capital does not only supply capital but generally also has a consulting and supporting role vis-à-vis management. **Private equity** (PE), by contrast, is more appropriate for mature enterprises requiring capital for specific purposes (stock market flotation, expansion, management buyouts). In this case, the provider of capital has a more reserved role vis-à-vis management. According to a recent survey,²⁵ 5% of medium-sized enterprises currently intend to use VC/PE financing in the future. According to enterprises, their scant interest is due to the say investors would potentially have in the management of the enterprise. However, 31% of medium-sized enterprises are unfamiliar with this instrument.

²³ Cf. *Industriewissenschaftliches Institut (2005), Mittelstand und Kapitalmarkt, Ergebnisse einer Befragung nicht-börsennotierter Unternehmen in Österreich, Vienna*. See also: <http://www.aktienforum.org/218.html>.

²⁴ This survey on “Banking Relations with Austrian Medium-Sized Enterprises” was carried out by Schwabe, Ley & Greiner Ges.m.b.H. at 4,833 Austrian enterprises (response rate: 7.57%) and the results were made available to the Oesterreichische Nationalbank (OeNB). In this survey, medium-sized enterprises are defined as all enterprises with sales between EUR 7 million and 40 million.

²⁵ See footnote 23.

Slight Decline in Ratio of Specific Loan Loss Provisions to Claims on Nonbanks

The ratio of specific loan loss provisions to claims on nonbanks²⁶ registered a slight year-on-year decline of 0.14 percentage point to 3.4% in January 2005. This downtrend, which has been visible since early 2004, reflects the improving economic climate. Likewise, new credit risk provisions registered a further decline in 2004 after decreasing in 2002 and 2003. Adjusted for the release of loan loss provisions, net provisions for the Austrian banking sector as a whole in fact declined by 8% in 2004 after having already fallen by 7% in 2002 and by 14% in 2003.

In sectoral terms, however, a different picture²⁷ can be seen. At state mortgage banks, for instance, the ratio of loan loss provisions to claims on nonbanks was down by 0.2 percentage point to 2.04% in January 2005, as were those at building and loan associations (–0.05 percentage point to 0.58%) and special purpose banks (–0.16 percentage point to 0.68%). At Volksbanken too, the ratio of loan loss provisions to claims on nonbanks fell by 0.28 percentage point to 4.98%. By contrast, the ratio at Raiffeisen banks remained almost unchanged (4.46%). In January 2005, joint stock banks reported a year-on-year rise in the ratio from 0.37 percentage point to 3.37% while savings banks registered a decline of 0.16 percentage point to 3.93%.²⁸ In January 2005, foreign bank branches reported a ratio of loan loss provisions to claims on nonbanks of 3.73%.

The mean ratio of loan loss provision to claims on nonbanks at the ten largest Austrian banks (excluding special purpose banks) also declined slightly, standing at 2.83% in January 2005. This means that, as in previous years, the mean ratio of these banks is still lower than the value for all Austrian banks, although this gap has narrowed in the last few years. In January 2005, the median of all Austrian banks, which has steadily been at least 1 percentage point above the value of all Austrian banks since 2000, was 4.66%, thus remaining almost unchanged on a year-on-year basis. Overall, the number of banks (excluding special purpose banks), which had ratios of loan loss provision to claims on nonbanks exceeding 15% year on year, increased from 16 to 17. However, these banks are, without exception, small, systemically unimportant banks.

Foreign Currency Loans Remain Increasingly Popular

Since the mid-1990s, financing in Swiss francs and Japanese yen has grown increasingly important for both households and enterprises in Austria. At EUR 48.5 billion, the total amount of foreign currency loans issued to domestic nonbanks peaked in January 2005, accounting for 19.2% of all loans issued to Austrian nonbanks.

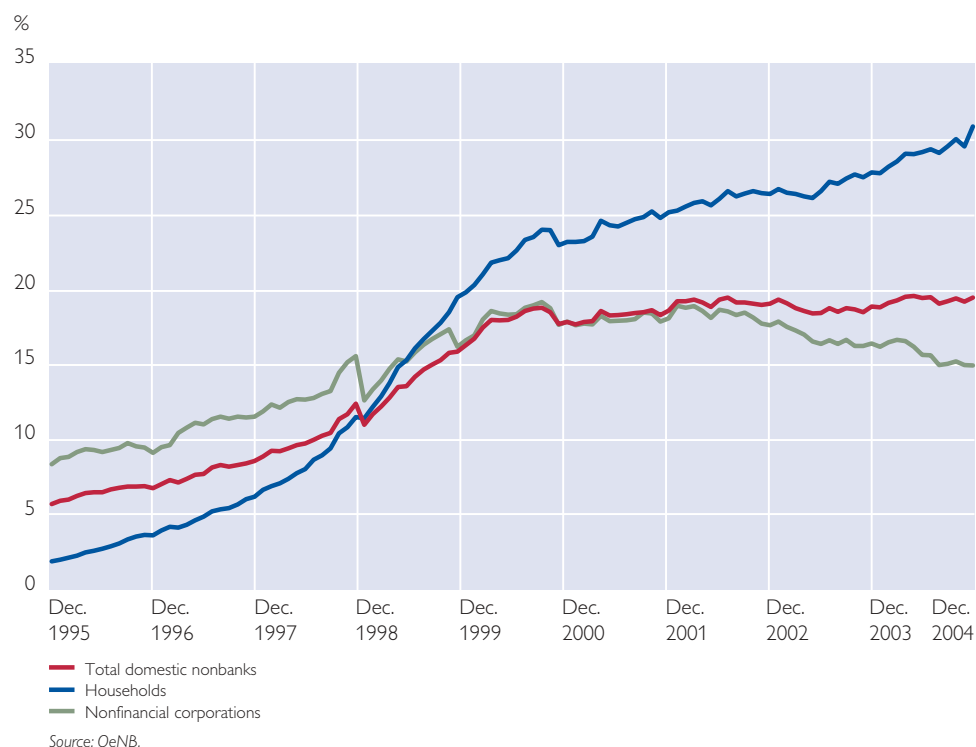
Household borrowing, in particular, is responsible for this development. Steady growth since mid-2003 in the share of foreign currency loans in all household loans has continued

²⁶ As experience shows, provisions for interbank loans are rather low and thus not taken into account in the following analysis. Specific loan loss provisions for outstanding claims on nonbanks are recorded in the monthly reports sent by banks to the OeNB and represent provisions for possible losses on loans, for which the borrower's solvency is in doubt.

²⁷ Multi-tier sectors traditionally have higher ratios of specific loan loss provisions to claims on nonbanks.

²⁸ However, these figures are influenced by the reclassification of BA-CA from the savings bank sector to the joint stock bank sector; hence, the figures are not fully comparable.

Chart 22

Share of Foreign Currency Loans in Overall Loans to Domestic Nonbanks

undiminished, peaking at 30.4% in January 2005. At 14.8% (at last count), exposure to foreign currency loans continued to decline slightly for nonfinancial corporations (see chart 22).

With a share of 89.1% of all foreign currency loans issued to nonbanks in January 2005, the Swiss franc maintained its position as the dominant currency. The Japanese yen's importance is currently stagnating at a low level, on a par with the volume of loans in U.S. dollars.

The foreign currency loan volumes indicated here are maximum values since no data are available on contributions made toward the repayment vehicles created for these loans. While the savings accrued under the repayment vehicle schemes lower the loan volumes, these volumes remain relatively high by euro area standards. Moreover, it should be borne in mind that,

whereas repayment vehicles diminish some of the credit risk underlying foreign currency loans, the foreign currency risk and thus the resulting indirect credit risk are reduced only if the repayment vehicle matches the currency in which the loan is denominated. From the perspective of financial stability, this means that the absolute and relative level of foreign currency borrowing should also be closely monitored in future.

Moderate Market Risk Trends

In addition to credit risk, market risk is another key risk category for any banking system. An important aspect of market risk is that changes in risk factors such as interest rates, equity prices or exchange rates can trigger losses in value of the on- and off-balance sheet positions held by banks.

Key Features of Interest Rate Risk Profile Unchanged, Interest Rate Risk in the Banking Book Down

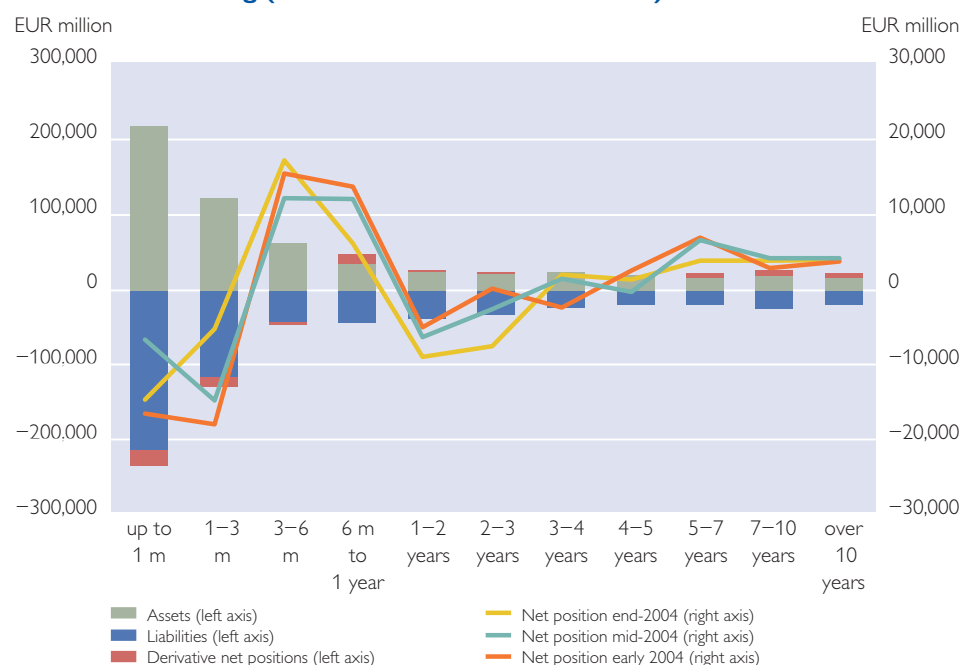
The key features of the interest rate risk profile of the Austrian banking system as a whole did not fundamentally change in 2004.²⁹ Interest rate fixation periods of up to three months show net liability positions, followed by net asset positions in the band up to one year,

followed by net liabilities in fixation periods of up to three years, and, finally, by net asset positions for longer terms. This can be seen from chart 23 where net interest rate positions – determined for all currencies³⁰ – are broken down by the term to the next interest rate fixing for the start, middle and end of 2004 (see chart 23).

Chart 23

Breakdown of Interest Rate-Sensitive Positions by Term to Next

Interest Rate Fixing (Determined for All Currencies)



Source: OeNB.

Negative effects on the banking system from interest rate changes due to this exposure depend on how the yield curve as a whole is moving. In commonly used risk assessment scenarios,

a parallel shift in the yield curve is assumed. Accordingly, a parallel yield curve shift for all currencies by 200 basis points is applied for calculating the Basel ratio for interest rate risk.³¹

²⁹ This analysis is based on the data of the interest rate risk statistics and does not comprise trading book positions of banks running a large trading book. 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 banks assess on the basis of market interest rates.

³⁰ The resulting net interest rate positions are largely attributable to the euro area.

³¹ The Basel ratio for interest rate risk indicates the percentage decline in a bank's eligible regulatory capital as a result of an interest rate shock such as this.

In 2004, the average of the Basel ratio – determined for all Austrian banks by weighting by total assets – shrank relatively sharply from 7.8% to 6.1%. On the basis of these data and this assumed scenario, it can therefore be concluded that the interest rate risk in the banking book was reduced in the Austrian banking system as a whole in 2004.

However, Austrian banks' capital requirements for position risk of interest rate instruments of the trading book continued to increase – as they have since mid-2003 – in the second half of 2004 as well (from EUR 515 million to EUR 610 million). Although these figures lag behind those of 2000 (average: EUR 865 million), the trend in increased trading activity with interest rate instruments seems to be lasting.

Following an uptrend in the first half of 2004, stagnation in equity trading emerged in the second half of the year. At the end of 2004, the capital requirement for equity position risk in the trading book was EUR 43 million (EUR 52 million after the first six months of the year, EUR 28 million at the start of the year). The exposure of the Austrian banking system to equity price risks is deemed to remain limited (see also results of the related stress tests).

In 2004, capital requirements for open foreign exchange positions remained almost unchanged (EUR 53 million at the end of the year vs. EUR 55 million at the start of the year). The US dollar and Swiss franc continue to be the most important cur-

rencies in which open positions were held.

Payment and Securities Trading, Clearing and Settlement Systems Ensure System Stability

In 2004, 17 payment and securities trading, clearing and settlement systems, through which some 380 million transactions worth approximately EUR 8,700 billion were processed in total, were in operation in Austria. In terms of volume, about 99% of aggregate transactions was processed by retail payment systems,³² of which most (around 190 million transactions) were processed by direct debit³³ payment systems. In terms of value, ARTIS/TARGET³⁴ accounted for roughly 97% and securities trading, clearing and settlement systems for about 2% of transactions processed. Steady growth in transaction processing was observed in almost all payment systems. Striking growth rates (+34%) were also seen in systems with e-money functionality, which so far have been relatively insignificant. In 2004, 13 Austrian banks participated in international payment systems. With approximately 6 million transactions, STEP2, which is operated by the European Banking Association (EBA), was the most used payment system, indicating its growing acceptance as a pan-European retail payment system by Austrian market participants. With some EUR 940 billion, the highest transaction values were processed by EURO1, the larger value payment system also operated by the EBA.

³² Payment systems with direct debit, cash electronic money, charge and credit functions that are used to transfer retail payments.

³³ Payment systems with a direct debit function enable point-of-sale payments that are offset against the payer's account at the earliest possible value date.

³⁴ ARTIS: Austrian Real Time Interbank Settlement System; TARGET: Trans-European Automated Real-time Gross settlement Express Transfer System.

None of the 36 disturbances in system operation³⁵ or in system participation recorded in 2004 had an adverse impact on the Austrian financial system. These disturbances were largely due to software problems, network breakdowns or unplanned IT maintenance work. None of the payment sys-

tems was subject to multiple system disturbances. ARTIS, the securities trading, clearing and settlement systems and the key infrastructure facilities of the *Austrian Payment Services Ges.m.b.H. (APSS)* proved to be resilient to disturbances in particular.

The Importance of Secure Payment and Securities Trading,

Clearing and Settlement Systems for Financial Stability

Liquidity of more than EUR 1,500 billion flows into the Eurosystem's wholesale payment systems on a daily basis. This is equivalent to 25% of the euro area's annual gross domestic product. The volumes in the systems used to settle securities transactions are no less significant. In addition to their importance for settling transactions within and between financial markets, the abovementioned systems are an essential transmission mechanism for the Eurosystem's monetary policies. A possible system failure would have not only a direct impact on the liquidity of the monetary and financial markets but could be expected to have a knock-on effect on other areas of the economy as well. This potential threat, which is described as a system risk, consists in a chain reaction triggerable even by a sole system participant, due to credit and liquidity risks as well as operational risks. Central banks therefore need to focus on the stability of these financial infrastructures and their resilience to crises. However, they also need to secure systems and instruments that are used for retail payment purposes since people's confidence in the security and reliability of these systems and instruments stands in direct proportion to their confidence in the currency per se.

For central banks, therefore, payment system oversight is a prerequisite for fulfilling their core tasks. As far as EU legislation is concerned, the legal foundations underpinning payment system oversight are Article 105 (2) of the Treaty Establishing the European Community, Articles 3 and 22 of the ESCB statutes and, in Austria's own case, Article 44a of the Federal Act on the Oesterreichische Nationalbank. Within the framework of the Eurosystem, the OeNB accordingly collaborates in developing legal, financial, organizational and technical standards for ensuring system security, whereof it monitors compliance in Austria. These requirements that are considered essential to guarantee system security are originally based on ECB Council Resolutions and are published in the OeNB's so-called oversight standards.³⁶ The smooth functioning of the Austrian systems and the participation of Austrian banks in international systems are also monitored by an oversight system for reporting statistics (payment system statistics) on an ongoing basis.

Banks Driven Strongly by Booming CEE Business³⁷

The business activities of Austrian banking subsidiaries in Central and Eastern Europe continue to post stable growth in terms of both total assets and profitability. In all, sixteen major global banking players operate in this

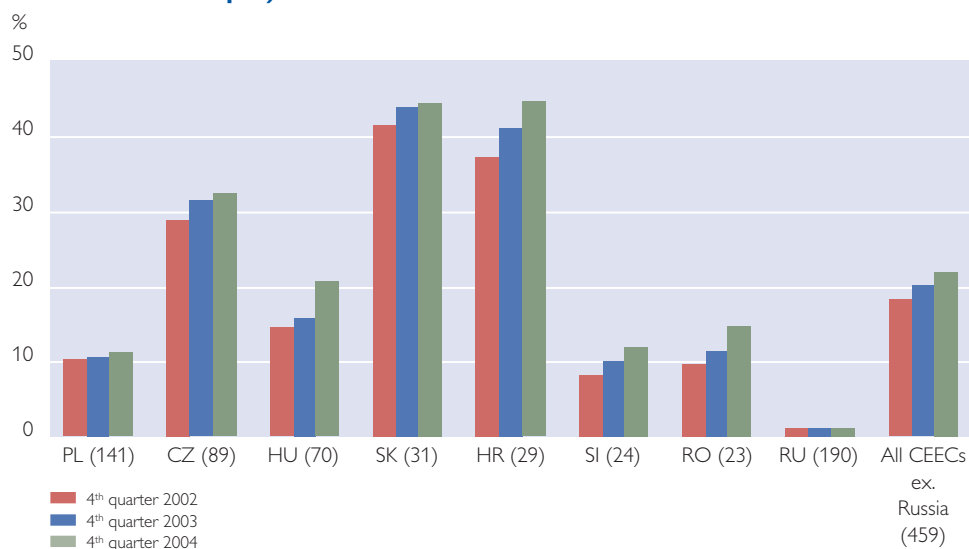
market. Of these, five are Austrian banks with a significant commitment and strong representation in the new EU Member States, in particular. In addition to Erste Bank, which is the second-biggest international bank by total assets in this market after Belgium's KBC, BA-CA (in fourth place after

³⁵ System disturbance is defined as any system standstill exceeding 30 minutes during operating hours and is induced by the payment system, or any standstill due to system disruption during the last 30 minutes preceding settlement cut-off.

³⁶ The abovementioned documents are located at http://www2.oenb.at/rel/zsa_p.htm.

³⁷ The source is the financial and income statement Austrian banks have published on a quarterly basis since early 2002. This publication contains selected items from the consolidated annual reports of parent banks and their fully consolidated subsidiaries abroad.

Market Share of All Austrian Banking Subsidiaries in Central and Eastern Europe¹⁾



Source: OeNB.

¹⁾ Figures in parentheses are the total assets of the aggregate banking system in the relevant countries in EUR billion.

UniCredit), RZB – the pioneer in the Central and Eastern European banking market – Hypo Alpe Adria and ÖVAG are also represented in this region. Austrian banks now account for around 20% of the banking market as a whole in Central and Eastern Europe (see chart 24). Italian banks rank second with a share of almost 12%.

The number of fully consolidated Austrian banking subsidiaries in Central and Eastern Europe increased from 50 to 53. The aggregate total assets of all fully consolidated foreign subsidiaries in these markets were approx. EUR 102.6 billion at the end of December 2004, which is equivalent to a rise of 34% year on year. Compared with the previous year's period, however, growth can be said to have further accelerated (2003 growth: + 13%).

Claims on nonbanks³⁸ in Central and Eastern Europe grew broadly in line with total assets. This develop-

ment is reflected in the increase in the "claims on nonbanks" balance-sheet item in the period between the end of 2003 and the end of 2004, with growth of 35% and an increase in total assets of 34%. In the previous year's comparable period, these two items had grown 23% and 13%, respectively.

In 2004, the aggregate operating profits of Central and Eastern European banking subsidiaries grew by 34% year on year to EUR 1.8 billion. The cost/income ratio improved from 64% in 2002 to 62% in 2003 to 59% in 2004. This is basically due to operating income growing at a faster pace than operating expenses. Furthermore, the subsidiaries represented 22% of their ten parent banks' aggregate total assets and generated just above 40% of their aggregate operating profits. It should be borne in mind that Austrian banks are becoming increasingly dependent on growth in markets (that have so

³⁸ These are loans issued by Austrian banking subsidiaries operating in CEE countries (indirect loans).

far been volatile). On the one hand, the still satisfactory economic situation in most CEECs and the preparatory measures adopted by further potential accession candidates will offer positive conditions and contribute to a stable economic environment. Furthermore, the service sector's still continuing catch-up process in less tapped markets will last for years owing to the tiny degree of market penetration by finan-

cial services particularly in Eastern and Southern European countries, thereby offering banks and other financial institutions continued stable growth prospects in the longer term. On the other hand, the catch-up process for financial services is already fairly well advanced in some of the new Member States and the related growing competition will squeeze margins.

Table 4

Key Figures of Austrian Banking Subsidiaries in 13 CEECs

	Total assets (EUR million)	Operating profits (EUR million)	Loan loss provisions (% of claims on nonbanks)	Cost/income ratio (%)	ROA after tax (%)
2002	67,827.5	1,175.5	6.3	63.7	1.05
2003	76,579.2	1,379.3	4.5	61.8	1.28
2004	102,645.1	1,853.6	3.4	58.7	1.32

Source: OeNB.

Another Record Year for National Banking Sectors in Central and Eastern Europe³⁹

In 2004, GDP growth in all the countries under review (with the exception of Croatia) accelerated, partly due to stronger investment growth. This development led to higher growth (adjusted for inflation) in corporate and household loans in Slovenia and the Czech Republic. Loan growth in Bulgaria and Romania remained very high (+30% to 40% year on year). Hungary and Croatia also enjoyed robust growth (around +10%) whereas Poland and Slovakia continued to experience sluggish levels despite economic recovery and increased household loans. This was attributable to weak (in Poland, even falling) demand for corporate loans. In Poland, this is due to the particularly healthy corporate profit situation.

Despite loan growth, the share of nonperforming loans⁴⁰ as a percentage of the entire loan book continued to decline in all the countries under review during 2004. However, the steep loan growth should be taken in account when assessing this decline. Moreover, difficulties in servicing this strong expansion in loans are not likely to be fully assessable until at a later stage.

³⁹ In this section, developments in the aggregate banking sector in the Czech Republic, in Hungary, Poland, Slovakia, Bulgaria, Croatia and – to a limited extent due to the data situation – in Romania are examined and not only those of the Austrian banking subsidiaries established in these countries.

⁴⁰ Nonperforming loans are defined as substandard, doubtful and loss loans. In view of differences in both national classification rules and the range of loans included in this classification, a cross-country comparison is difficult.

Although Central and Eastern European banks have small open foreign currency positions,⁴¹ their relatively high share of foreign currency loans to both domestic enterprises and households (excluding general government and banks) represents a credit risk. This is attributable to the fact that households and some enterprises are insufficiently hedged against a weakening of their local currency relative to the loan currency. Foreign currency loans play an important role, above all, in Bulgaria (48.1% of all loans to domestic enterprises and households), Romania (60.8%), Croatia (9.3%; moreover, almost 65% of loans are indexed to the exchange rate performance relative to the euro), Hungary (39.0%) and Slovenia (33.1%). The share of foreign currency loans continued to climb relatively steeply in 2004 in these countries (with the exception of Croatia, where it remained broadly stable).

Banks' earnings improved or remained stable at a high level. Net interest income was boosted in several countries, partly as a result of robust loan growth. Both an improvement in the cost/income ratio and, in many countries, a corporate tax cut had a beneficial impact on banks' net profits.

Nominal Return on Equity

%	2001	2002	2003	2004	H1 03	H1 04
Bulgaria	18.9	14.6	14.8	17.1	20.8	18.5
Croatia	6.6	13.7	14.5	n. a.	17.9	17.9
Poland	12.8	5.3	5.5	15.7	10.3	17.1
Slovak Republic	7.9	11.5	10.5	13.0	11.6	13.8
Slovenia	0.6	8.5	8.2	8.7	n. a.	n. a.
Czech Republic	16.6	27.4	23.4	23.3	22.7	22.4
Hungary	16.0	16.1	18.7	23.7	21.9	25.8

Note: Based on profits after tax. Intra-year data are annualized linearly.

Net Interest Income

% of annual average bank assets	2001	2002	2003	2004	H1 03	H1 04
Bulgaria	4.2	3.9	4.7	4.8	4.6	4.9
Croatia	3.6	3.3	3.4	n. a.	3.4	3.1
Poland	3.7	3.4	3.1	3.2	3.1	3.2
Slovak Republic	2.5	2.7	2.9	n. a.	2.9	2.9
Slovenia	3.6	3.7	3.2	2.9	3.4	2.9
Czech Republic	2.5	2.4	2.1	2.3	2.1	2.2
Hungary	4.2	4.3	4.0	4.3	3.9	4.0

Note: Data between countries not comparable. Intra-year data are annualized linearly.

⁴¹ Official data on both on-balance sheet and off-balance sheet open foreign currency positions reveal few open positions for Bulgarian, Croatian, Polish, Czech and Hungarian banks (less than 1% of total assets). Slovak banks had an on-balance sheet net short position of some 5% in December 2004, and Slovenian banks an on-balance sheet net short position of 1.3% at the end of 2003.

Current Operating Costs

% of current operating income

	2001	2002	2003	2004	H1 03	H1 04
Bulgaria	64.1	63.5	63.0	57.8	60.7	55.4
Croatia	65.6	59.3	57.3	n. a.	54.9	55.5
Poland	62.4	63.5	68.7	65.3	66.4	64.8
Slovak Republic	65.7	57.9	64.6	56.3	58.9	56.6
Slovenia	65.2	59.7	62.5	60.8	62.7	57.8
Czech Republik	53.4	51.4	52.6	47.2	49.4	49.0
Hungary	66.7	64.7	60.1	53.1	57.6	49.8

Net Change in Loan Loss Provisions

% of current operating income

	2001	2002	2003	2004	H1 03	H1 04
Bulgaria	-8.7	1.3	3.7	8.9	-9.0	6.2
Croatia	13.7	6.6	7.0	n. a.	8.0	4.5
Poland	18.9	22.9	15.2	7.9	11.2	7.0
Slovak Republic	-33.4	-9.8	-12.5	-10.4	-13.1	-14.2
Slovenia	25.9	19.8	16.6	16.0	12.2	17.1
Czech Republic	22.8	9.3	0.8	10.0	16.1	11.1
Hungary	4.3	4.7	-5.5	-7.5	-4.3	-8.7

Nonperforming Loans

% of all loans

	2001	2002	2003	2004	H1 03	H1 04
Bulgaria	4.5	3.6	4.2	3.5	4.5	2.4
Croatia	7.3	5.9	5.1	n. a.	5.5	5.1
Poland	18.4	21.6	22.1	15.2	22.6	17.9
Slovak Republic	21.0	11.0	9.1	7.0	10.5	7.8
Slovenia	7.0	7.0	6.5	5.5	6.8	6.0
Czech Republic	14.1	8.5	5.0	4.1	6.5	4.6
Hungary	3.6	3.7	3.0	2.9	3.3	3.4

Banks' Risk-Bearing Capacity Still Guaranteed

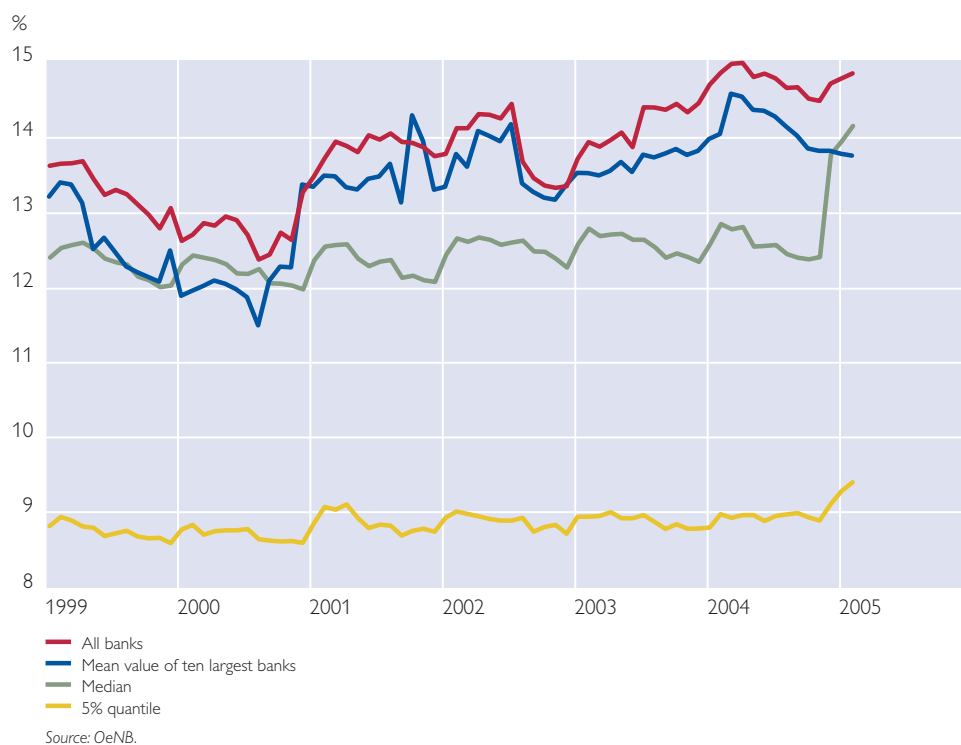
Capital Ratio Remains High

The capital ratio, which is a key indicator for banks' risk provisions, is used to assess the risk-bearing capacity of Austrian banks. In January 2005, the unconsolidated capital ratio, relating banks' capital to their risk-weighted assets, was 14.8% for all Austrian banks

(see chart 25). At the end of 2004, the consolidated capital ratio amounted to an equally comfortable 12.2%. This means Austrian banks' capital ratios remain at a very high level, clearly exceeding the required minimum capital ratio of 8%. Austrian banks therefore have a sizeable capital buffer, should stressful or crisis scenarios arise.

Chart 25

Capital Ratio of Austrian Banks (Unconsolidated Capital Ratio)



Latterly, these high capital ratio trends can be tracked by the median value, in particular. In January 2005, the median value of all Austrian banks⁴² came to 14.0% on an unconsolidated basis and has, for the first time in a while, exceeded the mean value of Austria's ten largest banks in terms of total assets. Although these largest banks have seen a slight deterioration in capital adequacy, their average

capital ratio of 13.8% in January 2005 remains at a comfortable level.

An improvement in risk provisioning can also be seen by the value for the 5% quantile, which represents banks with relatively weak capital ratios. In early 2005, the value for the 5% quantile increased from 8.8% in January 2004 to 9.3% in January 2005. From the perspective of the last few years, this value represents a record high.

⁴² Special purpose banks are not included in determining the values for the ten largest banks and the median.

The individual banking sectors do not show any striking developments. Owing to BA-CA's switch (for reporting purposes) from the savings bank sector to the joint stock bank sector, the joint stock bank sector (aside from special purpose banks) now boasts the highest capital ratio (January 2005: 15.8%).

As to the core capital ratio, which by relating tier 1 capital (core capital) to the assessment base also measures the capital adequacy of banks, the industry total of all Austrian banks on

an unconsolidated basis was high compared with previous years (January 2005: 10.2%).

All in all, Austrian banks have a strong risk-bearing capacity.

Risks for Banking System Look

Limited According to Stress Tests

Stress tests, which are used to assess the Austrian banking system's risk-bearing capacity as regards credit and market risks, were recomputed for the end of 2004.⁴³ Table 5 shows a summary of the results.

Table 5

Stress Test Results for the Aggregate Austrian Banking System

	%			capital ratio
Current capital ratio (dec. 2004)				14.71
Credit risk				
Domestic credit exposure				
Increase in the ratio of loan loss provisions to loans outstanding by			+30	13.79
Credit exposure in Central and Eastern Europe				
Increase in the ratio of loan loss provisions to loans outstanding by			+40	14.44
Foreign currency loans				
Appreciation of the Swiss franc against the euro by			+10	14.41
Appreciation of the Japanese yen against the euro by			+20	14.64
Accumulated credit risk				
Consideration of all three credit risk components at the same time ¹⁾				13.32
Market risk	basis points			capital ratio
Interest rate risk	short	medium	long	
EUR Upward parallel shift of the yield curve	130	130	130	14.36
USD Upward parallel shift of the yield curve	110	110	110	14.65
CHF Upward parallel shift of the yield curve	150	150	150	14.70
JPY Downward shift of yield curve ²⁾	-20	-40	-130	14.68
Equity price risk	%			capital ratio
Domestic stock market crash, decline in ATX by			-30	14.55
International stock market crash, decline in international stock indices by			-35	14.50
Exchange rate risk				
Worst case estimate ³⁾ , appreciation/depreciation of the euro by			±10	14.62

Source: Own calculations based on data reported to the OeNB.

¹⁾ Increase in the ratio of loan loss provisions to total outstanding loans by 30% for claims on domestic nonbanks in euro, by 40% for direct and indirect loans to nonbanks in CEE countries, and appreciation of Swiss franc by 10% and Japanese yen by 20%.

²⁾ In the case of the Japanese yen, there was no parallel downward shift in the yield curve so as to avoid a negative interest rate scenario.

³⁾ Reduction in absolute values of all banks' open foreign exchange positions in 12 major currencies (excluding CEE currencies).

⁴³ The methodology on which the stress tests are based is described in Financial Stability Report No. 7.

Marginal increases in the loss potential (implied by the assumed scenarios) for the aggregate Austrian banking system relative to the stress tests for mid-2004, for the interest rate risk in Japanese yen, for the domestic equity price risk, and for exchange rate risk are offset by a reduction in the loss potential for interest rate risk exposure in

the euro area, for domestic credit risk, for credit risk vis-à-vis Central and Eastern Europe, and for credit risk of loans to domestic nonbanks in Japanese yen. The Austrian banking system's resilience to shocks can be positively assessed using the results of the stress tests.

The Analytical Framework in Austrian Banking Supervision

In Austria, off-site analysis plays a particularly important role in the supervisory process, as on-site analyses cannot be carried out very frequently owing to the country's high degree of banking density. In addition to long applied, proven tools of analysis, subject to recalibration and updating at regular intervals, supervision also relies on new tools that were developed on a scientifically sound basis and are state of the art even by international standards. The key models are listed in the table below:

Tool of Analysis	Scope of analysis	Key Result	New Devlpt.
Logit model	Total risk scenario	Probability of defined event (PD)	Yes
Cox model	Total risk scenario	Distance to defined event (DtD)	Yes
Structural model	Total risk scenario	Value at Risk (VaR)	Yes
Systemic risk monitor	Total risk scenario	Probability of defined event (PD)	Yes
CAMEL	Total risk scenario	Ranking	No
Filter system	Total risk scenario	Conspicuous cases identified	No
Interest rate risk outlier	Aspect of total risk	Yes/No	No
Infringements of the Austrian Banking Act	Aspect of total risk	Yes/No	No
Profitability	Aspect of total risk	Relative profitability	No
Problem loan cover	Aspect of total risk	Relative amount of credit risk	Yes
Overall MLR analysis	Aspect of total risk	Conspicuous cases in MLR portfolio	Yes
Rating consistency	Aspect of total risk	Yes/No	Yes

Furthermore, great importance is also attached to providing a clear presentation and collation of the different quarterly analyses so that a meaningful overall picture of the Austrian banking scenario can be formed from the many individual analyses. To offer all market participants and interested parties in the financial arena an insight into the analytical tools used in Austrian banking business analysis, the OeNB and FMA have produced a joint publication entitled "Die Analyselandschaft der österreichischen Bankenaufsicht" ("The Analytical Framework in Austrian Banking Supervision").

Ratings of Major Austrian Banks Remain Stable

In addition to data from the reporting system, on which most of the analyses on the banking sector's performance

and stability are based, publicly available data on the major banks, in particular, also provide insights into the Austrian banking sector's health. These data include the ratings and stock pri-

ces of banks. Long-term ratings, covering savings, sight and term deposits as well as interbank business and subordinated liabilities, remain stable, having changed only minimally in recent months. In January 2005, Investkredit was downgraded by Moody's by a single notch from A2 to A1. The U.S. rating agency justified this move by citing that Investkredit's future ownership structure was unclear owing to ÖVAG's announcement that it intended to fully acquire Investkredit. ÖVAG has since acquired the participating interests held by BAWAG-PSK, Erste Bank and Wiener Städtische in Investkredit, in which it now has a 45.5% interest since February 2005. Further talks will be held with BA-CA and RZB, which have participating interests in Investkredit of 28.1% and 18.3%, respectively. Moody's fear is that ÖVAG's takeover of Investkredit could have an adverse impact on ÖVAG's capital ratio. Furthermore, the rating agency anticipates minimal synergy effects and additional costs for ÖVAG and downgraded its Bank Financial Strength Rating from C+ to C in January 2005 following the announcement of this takeover bid. In January 2005, Moody's corrected its outlook for BA-CA's long-term deposit rating from stable to negative. As a result, there are currently signs that the long-term rating could deteriorate from a current A2 in the next few years. According to the rating company, the predicted deterioration is due to the recent downgrading of the credit rating outlook of BA-CA's parent HVB (current deposit rating: A3). Using similar economic arguments, rating agency Standard and Poor's (S&P) downgraded BA-CA to Creditwatch, with baleful implications of a potential downward correction.

Successful IPO of Raiffeisen

International Bank-Holding AG

On April 25, 2005, RZB floated its Eastern European subsidiary, Raiffeisen International Bank-Holding (RI), on the stock market. Further bank acquisitions in Eastern and Southern Europe are to be financed with the flotation proceeds, which came to a total of EUR 1.11 billion including green shoe. Refinancing via the stock market will enhance RI's financial scope.

RI is a fully consolidated subsidiary of the RZB banking group, acting as a holding company and management entity for the group's companies in Central and Eastern Europe. Currently, RI operates in 15 Central and Eastern European markets with more than 900 bank branches and operates as a universal bank in this region.

The post-flotation free float is 24%. With a current stake of 70%, RZB remains the controlling shareholder. Prior to flotation, RZB held a stake of 86%, followed by the Raiffeisen regional banks with a stake of 6%, and the European Bank for Reconstruction and Development (EBRD) as well as the International Financial Corporation (IFC) with 4% each. In the wake of the flotation, the Raiffeisen regional banks disposed of their interest completely. World Bank subsidiary IFC and the EBRD now hold a stake of 3.2% and 2.8%, respectively.

RI's flotation is a major new issue for Vienna as a financial center and has helped strengthen the Vienna stock exchange. It was admitted to the ATX leading index at the end of April 2005.

Market Performance of Austrian Banks

The ATX Prime Market, which currently consists of 39 securities, includes four bank stocks (BA-CA, Erste Bank, RI and Investkredit), with a joint

market capitalization of EUR 25.8 billion as at April 30, 2005. Compared with September 2004, this amount increased by EUR 8.9 billion, or 52.3%. Between September 30, 2004 and April 30, 2005, ATX Prime Market's total market capitalization increased by EUR 18.1 billion to EUR 66.4 billion (+40%). As at the end of April 2005, the abovementioned four bank stocks accounted for close to 40% of ATX Prime's total market capitalization.

Other Financial Intermediaries Show Positive Developments

Insurance Companies Benefit from Favorable Climate on the Financial Markets

Private Pension Plans Drive Growth in the Life Insurance Segment

The recovery of the European insurance industry's profitability is continuing, driven primarily by positive developments on the financial markets – in particular, price gains on the equity and bond markets. However, given the low key interest rates and low risk and liquidity premiums on the markets, existing life insurance contracts with a guaranteed minimum return are also putting pressure on insurance companies' profitability.

Austrian insurers enjoyed an upward trend in operational business in 2004, due in part to the dynamic growth in Central and Eastern Europe, and were also able to benefit from positive developments on the capital markets. Insurers recorded rising premium income in both the life insurance and non-life insurance segments. Increasing awareness of the importance of private pension plans is apparent in the figures for annuities and state-subsidized personal pension plans, which are chiefly responsible

for the positive trend in the life insurance segment. While stock prices of insurance companies in Europe remained largely unchanged, the insurance stocks listed on the Vienna stock exchange's prime market segment outperformed comparable European benchmarks.

Foreign Fixed-Income Securities and Domestic Equity Securities Dominate Assets

Insurance companies' total assets (excluding reinsurance transactions) grew EUR 5.4 billion to EUR 68.3 billion in 2004. As in 2003, this growth was mainly attributable to the rise in investments in foreign fixed-income securities (up EUR 2.7 billion to EUR 15.6 billion) and, albeit to a lesser extent, an increase in domestic equities and other domestic securities (up EUR 2.3 billion to EUR 17.5 billion) as well as foreign equities (up EUR 843 million). Loans saw the largest decline (EUR 734 million) in terms of value on the assets side. The chief reason for this drop can be traced to the maturing of loans that had been granted to the Austrian federal government. Deposits with Austrian banks rose again in the second half of 2004. At EUR 2.5 billion, they were up 19% year on year. Further increases in fixed-income securities from domestic banks and loans to domestic banks have boosted insurance companies' exposure to banks to EUR 9.7 billion. With a share of 14.2% of insurance companies' total assets, this exposure is somewhat above the average for the past nine years. As investments with credit institutions by insurance companies merely correspond to some 1.5% of the total assets of Austrian banks, the contagion risk posed by the insurance industry for the banking sector is still low.

Insurance technical reserves in the life and health insurance segments grew at a rate of 8%, by EUR 3.3 billion to EUR 44.4 billion and by EUR 196 million to EUR 2.7 billion,

respectively, in 2004. In the far smaller property/casualty insurance segment, actuarial provisions were up 16.3% or EUR 33 million.

Hedge Funds and Financial Stability

On April 4, 2005, renowned representatives from consulting firms, prime brokers, hedge funds and foreign supervisory agencies spoke at an all-day workshop on the link between hedge funds and financial stability, which was held at the OeNB. The rapid growth of hedge funds in the past few years has led to concern about its possible impact on financial stability. One risk caused by hedge funds is the contagion risk they pose for other financial intermediaries. For example, there is a close relationship between hedge funds and the banking system due to banks' role as prime brokers, which take care of back office activities but also grant loans, and due to banks' own investments in hedge funds. Pension funds and insurance companies have also increased their exposure to hedge funds considerably over the past few years. Additional risks arise from the direct influence that hedge funds have on money markets, capital markets and commodity markets. Hedge funds can move significant volumes given their potential high leverage. If investors were to suddenly sell off their hedge fund shares, it could force the early liquidation of very large positions, which in turn could put individual market segments under heavy price pressures and increase their volatility. Possible spillover effects could carry these trends over into the market as a whole. In the light of the current very low risk and liquidity premiums on the financial markets, the question also arises as to what extent the massive increase in hedge fund volumes is linked to this trend and to what extent it contributes to the creation of imbalances.

*However, hedge funds can also have **positive effects** on the stability and functioning of the financial markets. For example, they help improve liquidity in tight market segments. Their contribution to promoting financial innovations and to improving the efficiency of risk sharing among financial market players, for whom hedge funds provide additional options for diversification, is also undisputed. Hedge funds' arbitrage strategies improve pricing information on the markets. (Investment) banks have been able to increase their options for diversification by (partially) outsourcing their proprietary trading to hedge funds, although this outsourcing also entails a loss of control and thus possibly considerable risks.*

In a nutshell, despite all the criticism, hedge funds represent an innovative contribution to financial intermediation. However, greater transparency is needed on the hedge fund market to allow early identification of possible risks and their impact on financial stability. Of particular importance in this respect is the corrective action that can be taken by prime brokers or other contractual partners, who should have incentive to exercise a certain monitoring function in order to avoid potential damage to their own reputations in the event of a crisis.

Positive Trend in Mutual Funds Continues

The favorable situation on the financial markets, greater propensity to invest and investors' positive response to new products were chiefly responsible for the 12.9% increase in the assets under management (incl. fund-of-fund investments) to EUR 125.3 billion as of the end of 2004. While payouts were down 2% to EUR 3.1 bil-

lion, due in part to the low interest rates, new investments were up 84.5% or EUR 10.4 billion. The upward trend on the financial markets boosted the capital-weighted total performance of all Austrian mutual funds⁴⁴ from 5.5% in 2003 to 6.0% in 2004.

Among Austrian retail funds, bond funds accounted for 59.2%, followed by balanced funds with 18.7% and

⁴⁴ Retail funds and institutional funds.

equity funds with 17.9%. At 3.1%, money market funds still accounted for only a small share of the total retail fund volume, although interest in this segment is growing steadily. Two new fund categories, *real estate funds* and *alternative funds*, have been well received by the markets. Real estate funds have been available since the fourth quarter of 2003 and accounted for a 0.5% share of the retail funds market as of the end of December 2004. The amendment to the Mutual Funds Act that entered into force on February 13, 2004, introduced the option to establish alternative funds, which quickly achieved a share of 0.7%.

While the volume invested by mutual funds in foreign stocks and equities increased at a below-average rate of 9%, to EUR 17.2 billion, holdings of domestic stocks and equities shot up 73.7% – supported by strong price gains of the domestic stocks listed on the Vienna stock exchange – and now account for 1.4% of total assets under management.

Severance Funds – Volumes Develop Dynamically, Yields Fall Short of Expectations

The legal basis for the operation of severance funds is the Act governing employee retirement and severance pay (*Betriebliches Mitarbeitervorsorgegesetz – BMVG*⁴⁵), which entered into force on July 1, 2002, and applies to employment relationships that were established after December 31, 2002, and are based on a private-law agreement. The law has a variety of objectives that are not always congruent, namely to eliminate hindrances to labor market mobility resulting from

the severance pay provisions in effect through 2002, to promote private pension plans and to strengthen the Austrian capital market. As of the start of the employment relationship, employers must transfer 1.53% of their employees' monthly remuneration (plus special bonuses) to the appropriate health insurance provider, which is then to forward the amount to the relevant severance fund.

Besides oversight by the Austrian Financial Market Authority (FMA) and specific regulatory provisions that are modeled on the Austrian Pension Fund Act, a guarantee of the capital invested is mandatory. In addition to the required own funds, 5% of the administrative costs are to be allocated to reserves that are earmarked for the fulfillment of the capital guarantee until they reach 1% of the vested rights to future severance payments.

In 2004, nine severance funds in Austria had the requisite license. Of these, seven are directly or indirectly owned by banks and insurance companies, one is owned by an industrial company and the ninth is a public-law corporation.

As of the reporting date of December 31, 2004, the vested rights to future severance payments, i.e. severance pay contributions, totaled some EUR 363 million, up 147.2% on the December 31, 2003, reporting date. This sharp rise is ascribable to the recent introduction of severance funds (2003) and the contribution-based funding principle. The majority of the severance funds' investments are indirect investments (74.5%), i.e. severance funds invest primarily in mutual funds. Foreign currencies account

⁴⁵ *Federal Law Gazette I 100/2002.*

for 1.4% of the assets invested. As of December 31, 2004, 2.08 million vesting periods had been established for 1.32 million individuals from 205,000 employers.⁴⁶ For 11.5% of the vesting periods, no severance fund agreements have yet been entered into.

Administrative and asset management costs are governed by Article 26 of the Act governing employee retirement and severance pay. Severance funds are permitted to retain between 1% and 3.5% of the severance pay contributions received to cover ongoing administration. In addition to the cash expenditures, which may be passed on fully, an asset management fee for the management of the investment returns may be retained (up to 1% of the invested severance pay assets). The severance pay assets as such must not be diminished by any deductions. Asset management costs amount to between 0.5% and 0.7% of the invested severance pay assets, which corresponds to a share of 8.3% to 17.5% at a nominal investment yield of 4% to 6%.

Lawmakers sought to achieve a severance pay amount equivalent to the annual salary that would be earned after 37 to 38 years' employment.⁴⁷ In mathematical terms, this entails an implicit average annual return of around 6% before costs (assuming an annual

increase of salaries of 2%). However, many severance funds assume a nominal yield of 4% to no more than 6% before costs in their long-term estimates and achieved lower yields in 2004 (severance fund average: around 4.6%). Investment yields are calculated monthly by the Oesterreichische Kontrollbank (OeKB) according to a method that is uniform for all severance funds. Market transparency is an important precondition for the stability of the financial system. Regular publication of the investment yields of the severance funds would increase market transparency.

Because all employers are required by law to join a severance fund and because of the contribution-based funding principle, the investment volume is guaranteed to grow. The minimum administrative costs stipulated under the law, market concentration⁴⁸ and the single license principle also limit the intensity of competition, thus ensuring stable income for the owners of the severance funds (primarily banks and insurance companies). This, in conjunction with the fact that the capital market risk is largely transferred to the vested individual, will in future contribute to the profitability and stability of the financial intermediaries.

⁴⁶ Source: Association of Austrian Social Security Institutions. One individual can have multiple vesting periods.

⁴⁷ Official record of the 106th session (June 12, 2002) Federal Minister Martin Bartenstein, p. 52.

⁴⁸ The three market leaders account for 74.5% of all employer agreements and 73.6% of all vesting periods.

SPECIAL TOPICS

The Consistency of Self-Declared Hedge Fund Styles – A Return-Based Analysis with Self-Organizing Maps

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While hedge funds have common features, they remain an extremely diverse asset class. Despite this diversity, a consistent classification system is important for numerous purposes such as portfolio construction, performance attribution as well as risk management. This topic is also connected to the financial stability debate, which has recently dealt intensively with the issue of hedge funds. Diversified (fund) portfolios with an appropriate risk monitoring system in place will e.g. enhance risk-sharing among financial market participants. As fund self-declaration is prone to strategic misclassification, return-based taxonomies grouping funds along similarities in realized returns can be used to avoid this pitfall. In this paper we use Self-Organizing Maps (SOM) to find homogeneous groups of hedge funds based on similar (return) characteristics. Based on this technique, we can identify nine hedge fund classes. Whereas managed futures, sector financial and short-sell hedge funds are largely consistent in their self-declared strategies, we detect a number of declared hedge fund styles displaying no or very limited return similarities. Especially the so-called “equity hedge” style encompasses too many different substyles with different return characteristics. Another important aspect that our paper addresses is the tendency of fund managers to perform undisclosed changes of their trading style or to strategically misdeclare their funds. Our results show that so called “style creep” is an issue in the hedge fund business, with funds which misclassified themselves once being very likely to change their trading style again.

1 Introduction

Despite the relatively limited share of hedge fund assets in overall financial market assets in industrialized countries, the significant rise both in the size and the number of hedge funds in operation as well as the increased interest of institutional investors in this asset class has shifted hedge funds to the center of financial market stability debate. However, there is no simple answer to the question whether hedge funds enhance or endanger financial market stability. It can be argued that hedge funds add liquidity to some inherently illiquid market segments and help achieve efficient risk-sharing among participants in financial markets. Furthermore, they potentially expand the investment possibility set and provide diversification benefits when added to

portfolios of traditional stock and/or bond investments. The extensive use of leverage by hedge funds, however, creates liquidity risk for the funds themselves. This may put strains on market segments hedge funds are particularly involved in and may lead to spillover effects that affect other financial intermediaries.² The experience of the Long Term Capital Management (LTCM) crisis in 1998 is a case in point. When the Russian Federation announced a debt moratorium, a global shift in demand towards safe and liquid assets initiated a widening in risk spreads. Together with a change in correlations between markets, i.e. simultaneous slumps in hitherto uncorrelated market segments, this development inflicted huge losses on LTCM, bringing the fund to the verge of bankruptcy.³ As

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² For a detailed discussion of financial stability aspects of hedge funds, the interested reader is referred to e.g. ECB (2004), SEC (2003) or Brealey and Kaplanis (2001).

³ See Jorion (2000) for an analysis of LTCM's risk position.

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OeNB.

concerns about a contagious default surged due to the immense size of (levered) LTCM positions, the U.S. Federal Reserve arranged a coordinated bailout by a consortium of the funds' main banks.⁴

This paper deals with one aspect of the hedge fund industry – the classification of funds into homogeneous groups. A consistent classification system is important for numerous reasons – it will help improve investment choices of investors, and funds of funds will refer to it in the construction of their portfolio to avoid undiversified exposures. A natural grouping of funds can furthermore help evaluate the discriminatory power of different styles. In this context, a consistent classification system contributes to an improved performance attribution by peer group analysis (see e.g. the four-factor model of Kandel et al., 2004, in this respect). It can also be useful in establishing risk management models for hedge fund investments.

All of these aspects are in one way or another connected to the safeguarding of financial market stability in that e.g. only diversified (fund) portfolios with an appropriate risk monitoring system in place will enable efficient risk-sharing. Information on hedge fund styles and the probability of funds changing their style over time thereby avoids the exposure of some investors to risks they did not intend to bear and allows other investors to take over the risks they are able to bear with more accuracy. Therefore, information on styles and the likelihood of a style change happening will in the end help increase the shock absorption capacity of financial markets. By the same token, a performance-

based fund selection will ideally help reduce the proportion of untalented managers in the market. With hedge fund manager compensation taking the form of an option (see e.g. Goetzmann et al., 1998), untalented managers depending on luck to “get into the money” are more prone to rely on volatile trading strategies, diminishing the stability of financial markets.

The hedge fund universe itself consists of a great variety of completely different investment and trading strategies. Despite having some common features (unregulated organizational structure, flexible investment strategies, sophisticated investors etc.), hedge funds remain an extremely diverse asset class (see e.g. Ackermann et al., 1999). As a consequence, both practitioners and academics are far from agreeing on a common hedge fund classification system (see Brittain, 2001) – while hedge fund index and database providers rely on their proprietary classification systems, academic research has just begun to adapt mutual fund-based classification methodologies to the idiosyncrasies of the hedge fund business. Several methods of fund classification can be distinguished. The most evident one is fund self-declaration. The problem with this classification method, however, is so-called “style creep,” i.e. the (strategic) misclassification of funds used to polish the fund's own performance with respect to its peers (see e.g. Brown and Goetzmann, 1997). Return-based taxonomies avoid this pitfall by grouping funds along similarities in realized returns. Sharpe (1992) was the first to show that a regression of mutual fund returns on a limited number of indices can be used to spec-

⁴ For a detailed discussion of the contagious impact of the LTCM crisis on financial institutions, see e.g. Kho et al. (2000), Furfine (2001) as well as Humayun and Hassan (2004).

ify different fund styles. Both Brown and Goetzmann (2003) and Fung and Hsieh (1997, 1998) expanded these models to the hedge fund universe. Whereas this methodology is very fit for traditional buy-and-hold long-only investments, it is problematic in the case of hedge funds, as is well documented by Fung and Hsieh (1997), due to the unique features of hedge funds, namely dynamic trading strategies including short positions that lead to an averaging error in a standard regression.⁵ Alternatively, traditional statistical clustering approaches have been used to classify hedge funds to avoid some of these problems (see e.g. Barès et al., 2001, and Miceli and Susinno, 2003). Both the extensions of Sharpe's style model as well as the clustering applications show that in contrast to findings for mutual funds (see e.g. Brown and Goetzmann, 1997, or diBartolomeo and Witkowski, 1997), self-declared hedge fund strategies are reasonably characteristic of underlying hedge fund styles.⁶

In this paper, we employ a novel methodology to deal with the specifics

of the hedge fund universe. We use Self-Organizing Maps (SOM) to find homogeneous groups of hedge funds based on similar (return) characteristics. The SOM is a neural network-based clustering procedure that maps data points from a higher dimensional space into a lower dimensional space using nonlinear mapping functions. By employing an unsupervised neural network approach which has proven to be reliable in a myriad of disciplines,⁷ we are able to avoid a number of problems associated with the regression-based factor approach. As is documented in the literature, the SOM also leads to superior results vis-à-vis traditional statistical clustering approaches such as single linkage, complete linkage, median linkage and K-means.⁸ In our paper we demonstrate that the SOM approach is perfectly suited for dynamic trading strategies, which previous models have been unable to deal with efficiently.⁹

As most studies on hedge fund styles are based on samples of return histories up to the year 2000 only and

⁵ Recently, contingent claims methodology has been shown to be of value for the classification and/or performance attribution of hedge fund strategies. The work of Fung and Hsieh (2001) and Mitchell and Pulvino (2001) showed, for trend following strategies and merger arbitrage strategies respectively, that option-like features in the strand of Glosten and Jagannathan (1994) capture the underlying risk/return profile of hedge funds much better. See also Agarwal and Naik (2000 and 2002) for a multi-factor approach to evaluate hedge fund performance that is based on option strategies. Note however that, as already pointed out by Glosten and Jagannathan (1994), each strategy requires the use of different (compound) options, making this technique rather hard to handle for classification purposes.

⁶ Note, however, that due to the extremely small number of funds analyzed in Miceli and Susinno (2003) – their sample only includes 62 funds – their results may suffer a rather severe sample bias.

⁷ In the field of finance, e.g., applications include determining similarities in market timing strategies of investment newsletters (Kumar and Pons, 2002), stock picking (Deboeck and Ultsch, 1998), interest rate structure modeling (De Bondt and Cottrell, 1998) as well as the classification of mutual funds (see Deboeck, 1998, and Moreno et al., 2002).

⁸ See e.g. Mangiameli et al. (1996) for the superiority of Self-Organizing Maps as a clustering method for “messy data” sets where the number of clusters is assumed to be known and Ultsch and Vetter (1994) for the case in which the number of clusters (homogeneous groups) in the data are assumed to be unknown a priori.

⁹ In a related article, Maillet and Rousset (2003) had a first try at the use of SOM to classify hedge funds. Their results are, however, based on a very narrow sample of funds (294) and are thus likely to display a severe sample bias, as the authors themselves also acknowledge. This may be one reason behind their failure to come up with a well trained map for hedge fund styles.

hedge funds have undergone a spectacular growth since then (see e.g. ECB, 2004, and SEC, 2003), it also seems natural to ask whether results based on the hedge fund market as it was several years ago are representative enough of today’s market environment.

To conclude, our method enables us to derive and visualize a consistent taxonomy for today’s hedge fund market. This will provide us with answers to the following questions:

- Are self-declared hedge fund styles a useful or misleading “label”?
- Do hedge funds change their styles over time, i.e. display so-called “style creep”?
- Are certain groups of funds particularly prone to misclassification?

In our answers to these questions, we can see that hedge funds are not as proficient at assigning themselves to a particular style as previous research suggests. Our results will help improve the choices of investors in terms of the construction of their portfolio as well as contribute to an improved performance evaluation. In view of the opaque nature of the hedge fund business, which is based on proprietary (and secretive) trading strategies, getting the most out of available data seems all the more important for an informed investment decision.

2 Methodology

The Self-Organizing Map (SOM)¹⁰ is an ideal tool for clustering and visualizing high-dimensional data; it is a single-layered unsupervised neural

network which does not require any human intervention during the training process.¹¹ The training process of the SOM can be described as the procedure where the map identifies the key features of the input space via a given set of input vectors. The SOM maps high-dimensional input data into a lower dimensional (usually two-dimensional, hence the term “map”) output space while preserving the inherent structure of the original data input, thus allowing the visualization of complex data sets. Therefore, if two vectors are similar in terms of the distance measure employed, their images will end up in the vicinity of each other on the map. In the present paper, each hedge fund represents an input vector, the dimension of which is given by the number of monthly return observations. After the completion of the training process, hedge funds exhibiting similar return characteristics will be represented as homogeneous clusters on a two-dimensional surface.

In order to represent higher-dimensional data on a two-dimensional map spanned by a single (initially regular) array of nodes, each input vector $x \in \mathbb{R}^n$ is compared with the parametric reference vector $m_i \in \mathbb{R}^n$ associated with each node i . The initial values of the reference vectors are in our case chosen randomly. The location of response is defined to be the node where the distance¹² between the input vector x and the reference vector m_i associated with that node achieves a minimum:

$$\|x - m_c\| = \min_i \{\|x - m_i\|\}.$$

¹⁰ *The Self-Organizing Map was originally developed by Teuvo Kohonen’s research group and enhanced by many others since the initial publication of the material more than a quarter of a century ago (see Kohonen, 1997, for an exhaustive treatise on the subject).*

¹¹ *This characteristic distinguishes the SOM from the “supervised” neural network techniques where both input and output data are fed into the system; a network of that type is useful when a given input-output relationship has to be learned, but it is unfit for our research problem.*

¹² *The Euclidean distance is used in most practical applications as well as in the present case.*

After m_c , the so-called “winner node”, has been determined, its value as well as that of its neighboring nodes is adjusted toward the value of the input vector x (this is in fact what constitutes the learning process). Following the completion of all the training passes, each input vector is finally assigned to the trained node most similar in terms of the distance measure employed.

Suppose that we have a finite number of observations indexed by $t = 1, 2, \dots$ such that the input vector corresponding to observation t is denoted by $x(t)$. The aforementioned adjustments of the winner node m_c and its neighbor nodes can be expressed in the following fashion:

$$m_i(t+1) = m_i(t) + \alpha(t)[x(t) - m_i(t)].$$
This learning process is only applied to those nodes m_i lying within a prespecified distance from the winner m_c ; the other nodes remain unchanged, i.e. $m_i(t+1) = m_i(t)$. The learning rate factor, $\alpha(t)$ with $0 < \alpha(t) < 1$, which establishes the magnitude of the adjustments, as well as the function defining the topological neighborhood of the winner node are both chosen to be monotonically decreasing in time (i.e. the number of completed training passes).¹³

It should be noted that the mapping process is not influenced by dimensions, i.e. return realizations at a given time, which exhibit similar values across all input vectors.¹⁴

From a more practical side, it should be noted that we use the

original SOM_PAK library along with an adjusted version of the labeling algorithm of Merkl and Rauber (2001).¹⁵

3 Data

Our paper is based on data from the CISDM (Center for International Securities and Derivatives Markets) hedge fund database. CISDM also provides a summary of the investment strategy and style for each fund. This proprietary classification will be compared to our neural network/return-based classification approach.

The data set includes monthly returns of 5,440 hedge funds until April 2004. In order to avoid what Fung and Hsieh (1997) term “multi-period sampling bias,” which may arise if hedge funds have very short return histories, we only include funds with a minimum of 24 monthly return observations, as recommended by Ackermann et al. (1999). This eliminates 879 funds from our sample. An additional benefit of requiring a minimum length for the return series is increased computational stability. Furthermore, the fund of funds category has been excluded from the analysis a priori in order to allow a focus on the “pure” trading strategies, which reduces our sample by another 853 funds. It should be noted that our results are not subject to survivorship bias, as we include 844 nonsurviving hedge funds in our analysis, i.e. funds which exhibit a minimum number of 24 observations but which have ceased

¹³ For specifics regarding the SOM methodology, please refer to Kohonen (1997), Deboeck and Kohonen (1998) or the SOM_PAK documentation.

¹⁴ If we consider for example the case that all input vectors (i.e. individual hedge funds in our case) feature a return close to 0.1 at dimension 15 (i.e. the 15th observation within a fund’s return history), then all trained reference vectors will have a value close to or equal to 0.1 at position 15. Therefore, the absolute distance between each input vector and all properly trained reference vectors with respect to dimension 15 will be very close to zero and hence does not contribute to the determination of the winner node.

¹⁵ The SOM_PAK was downloaded from http://ftp.funet.fi/pub/sci/neural/cochlea/som_pak/.

to exist sometime within the period under observation.

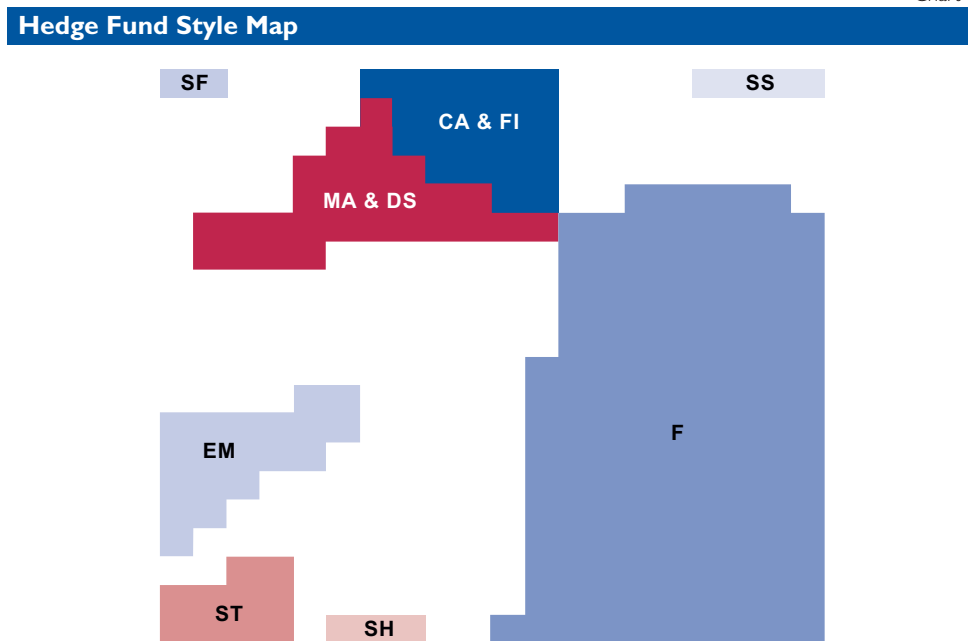
In order to obtain results which reflect the swift development of the hedge fund industry in recent years, we focus our research on the classification of funds in the ten-year period from April 1995 to April 2004. All of the above considered, this leaves us with a total sample of 2,442 funds.¹⁶

4 Results

The above mapping procedure identifies nine proprietary hedge fund classes (see chart 1 for the resulting

SOM and table 1 for a cross-tabulation of declared versus empirically confirmed hedge fund classes). Following Fung and Hsieh (1997) and Brown and Goetzmann (2003), the labeling is done according to the preponderance of managers of a given self-declared style in each group: convertible arbitrage (CA) and fixed income (FI), emerging markets (EM), futures (F), merger arbitrage (MA) and distressed securities (DS), sector financial (SF), sector health care (SH), sector technology (ST), short-selling (SS) and the class “other,” which encompasses all funds that could not be included elsewhere.

Chart 1



Source: CISDM, own calculations.

Note: A stylized representation of a 20x20 field map trained with our data sample. The hedge fund categories in the table are those adopted from the CISDM database and reflect the self-declared strategies. This particular map has been obtained with the following parameter specifications: rough tuning: Training cycles 13,000, $\alpha(0)=0.06$, training radius 11; fine tuning: training cycles 4,000, $\alpha(0)=0.01$, training radius 3. However, the results were very stable with regard to changes of parameter settings (within a reasonable margin).

¹⁶ The remaining funds are characterized by the following mixture of (self-declared) strategies: 136 Convertible Arbitrage funds, 74 Distressed Securities funds, 832 Equity Hedge funds, 133 Emerging Markets funds, 821 Futures funds, 80 Fixed Income funds, 76 Global Macro funds, 114 Merger Arbitrage funds, 26 Financial Sector funds, 28 Healthcare Sector funds, 7 Real Estate Sector funds, 46 Technology Sector funds, 25 Short-Selling funds, 27 Multi-Sector funds and 17 Long-Only funds.

These classes occupy sections of different sizes on the map. Whereas managed futures emerge as a large group in this respect, spanning an extensive section of the map, other styles, such as the sector exposed ones (Financial Sector funds, Healthcare Sector funds, Real Estate Sector funds, Technology Sector funds, Short-Selling funds and Multi-Sector funds) occupy relatively little space. The size information can be used to evaluate the degree of dispersion within each of the nine style groups identified, as Euclidean distance is used to depict return similarities on the map.

In contrast to previous research (see Brown and Goetzmann, 2003, or Miceli and Susinno, 2003), our findings suggest that a differentiated picture in the consistency of self-declared

fund styles has to be drawn (see table 1). We can see that some hedge fund styles do a fairly good job of self-classification: Particularly short-sell and sector financial hedge funds, as well as the category comprising managed futures are largely consistent in their self-declared strategies. In all of these cases, more than 65% of the respective funds are clustered in a meaningful way: The fund's self-labeling therefore has economic content in terms of a certain return pattern. Futures and short-sell strategies are especially well grouped by our map, with the percentage of correct self-declaration exceeding 79% in both cases. For managed futures, this underpins the hypothesis that idiosyncratic trading strategies reflected in their returns distinguish them quite substantially from other hedge fund styles.

Table 1

Declared vs. Empirically Confirmed Hedge Fund Styles

	CA	DS	EH	EM	F	FI	GM	MA	SF	SH	SR	SS	ST	SMS	LO
CA and FI	54.4	21.6	4.0	8.3	1.8	57.5	10.5	8.8	0	0	0	0	0	0	0
DS and MA	11.0	28.4	5.8	5.3	1.3	3.8	7.9	50.9	0	0	29.0	0	0	0	0
EM	1.5	1.4	4.3	42.1	0.4	0	2.6	0.9	0	0	0	0	6.5	0	5.9
F	1.5	4.1	6.1	1.5	79.5	11.3	35.5	2.6	3.8	0	14.0	0	8.7	0	0
SF	0	0	1.6	0.8	0.2	0	1.3	0	65.4	7.1	14.0	0	0	0	0
SH	0	0	1.2	0	0	0	1.3	0	0	53.6	0	0	0	14.8	0
SS	0	0	1.8	0	0.5	2.5	0	0	0	0	0	88.0	0	0	0
ST	0	1.4	3.1	1.5	0	0	2.6	0.9	0	3.6	0	0	41.3	7.4	23.5
Other	31.6	43.1	72.1	40.5	16.3	24.9	38.3	35.9	30.8	35.7	43.0	12.0	43.5	77.8	70.6
Sum ¹	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total ²	136.0	74.0	832.0	133.0	821.0	80.0	76.0	114.0	26.0	28.0	7.0	25.0	46.0	27.0	17.0

Source: CISDM, own calculations.

¹ In percent.

² Total number of funds in a given category.

Note: Cross-tabulation of self-declared strategies (rows) with empirically confirmed proprietary strategies (columns). The numbers given are percentage points. The abbreviations denote the following: CA and FI (Convertible Arbitrage and Fixed Income), EH (Equity Hedge and Market Neutral), EM (Emerging Markets), F (Managed Futures), GM (Global Macro), LO (Long Only), MA and DS (Merger Arbitrage and Distressed Securities), SF (Sector Financial), SH (Sector Healthcare and Biotechnology), SS (Short-Sell), SMS (Sector Multi-Sector), ST (Sector Technology).

For several other strategies, we see that a proprietary trading style emerges, but a considerable number of funds misdeclare themselves. In the case of merger arbitrage, convertible arbitrage and fixed income hedge funds, only 50% to 60% of the funds

can be meaningfully grouped with their peers. Furthermore, distressed securities, emerging markets and sector technology funds exhibit a considerable amount of misclassification; The map recognizes these styles, but well over half of the funds pertaining

to one of these self-declared groups are spread over other classes on the map. As a caveat it should, however, be mentioned that all of these styles occupy a rather limited surface on the map and are still able to capture a reasonable percentage of peers within these boundaries. Nonetheless, these results dictate caution in the investment choice and performance evaluation when dealing with the above fund classes.

Furthermore, we detect a number of declared hedge fund styles displaying no or very limited return similarities in our analysis. Especially the so-called “equity hedge” style does not seem to be a useful self-classification. Put differently, this style encompasses too many different substyles that convert the style into a misleading label – “equity hedge” funds are basically spread all over the plane. A similar argument applies for multi-sector and long-only funds, although these funds are more concentrated in several regions of the map without, however, clustering into a homogeneous group. Once again, caution in the construction of fund of funds and in performance attribution has to be exercised with these fund groupings.

In addition to these consistency results, the SOM also detects similarities in a number of declared hedge fund strategies, so that these styles could be interpreted as substitutes in the construction of fund of funds portfolios. Merger arbitrage funds and distressed securities funds, for instance, emerge as a single style. Due to the digital nature of the underlying business (deal closure or not and bankruptcy or not) and the fact that companies that are being taken over are often in a state of financial “distress,” the vicinity of merger arbitrage and distressed securities funds seems

to be perfectly rational from an economic point of view. Convertible arbitrage hedge funds and fixed income hedge funds also appear as a single style on the SOM. Their exposure to bonds can be quoted as a reason for this result. Furthermore, funds with sector exposure (technology, health care, financial, multi-sector) are located in relatively remote sections of the map. The distance of these groups to managed futures, for instance, is in line with the economic rationale that these funds are driven by equity markets to a much greater extent than managed futures are. The map could therefore also be split in terms of equity market exposure, which seems to be important in case of the lower and left section of the plane (see chart 1). This assessment is underpinned by the location of short-sell hedge funds in the opposed (upper right) corner.

In order to analyze the tendency of hedge funds to change their (return-based) style over time, we split our sample into two five-year periods. We exclude funds with less than 110 data points from our analysis to be able to follow the history of hedge funds over our two five-year subperiods and to guarantee enough overlapping returns for computational robustness. This leaves us with 459 funds in the “style creep” sample.

Tables 2 and 3 show the cross-tabulations resulting from the two five-year period maps. In general tables 2 and 3 display higher percentage values for consistent self-declaration, because we restricted our sample quite rigorously to be able to track the history of fund self-declaration. This restriction led to a lower dimensional map (10 × 10 fields versus 20 × 20 fields) and to fewer style groups emerging from the SOM classification

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process (six instead of nine). Furthermore, the fact that our “style creep” sample is now approaching a balanced panel makes the classification task easier for the SOM. Compared to the cross-tabulation in table 1 for the ten-year period map, the identification of fund styles that perform well in their self-classification process and those that do not is largely consistent.

Futures, short-sell and sector financial funds take the lead again, with equity hedge funds spread all over the map. Therefore, the style consistency of different hedge fund groups has by and large remained constant over time. However, the results based on the 1999 to 2004 time period seem to indicate that style inconsistencies of hedge funds were on the rise.

Table 2

Declared vs. Empirically Confirmed Hedge Fund Styles, 1994–1999

	CA	DS	EH	EM	F	FI	GM	MA	SF	SH	SS	ST	SMS	LO
CA, DS and MA	95	79	31	0	3	25	0	83	0	0	0	0	20	0
EM	0	0	1	78	0	0	0	0	0	0	0	0	0	0
F	0	7	5	6	91	75	30	0	0	0	0	0	0	0
SF	5	0	9	0	0	0	0	0	100	0	0	0	0	0
SS	0	0	6	6	1	0	0	0	0	0	83	0	0	0
Other	0	14	48	11	6	0	70	17	0	100	17	100	80	100
Sum ¹	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Total ²	19	14	116	18	232	4	10	23	6	1	6	3	5	2

Source: CISDM, own calculations.

¹ In percent.

² Total number of funds in a given category.

Note: Cross-tabulation of self-declared strategies (rows) with empirically confirmed proprietary strategies (columns) for the balanced sample of funds from May 1994 to April 1999. The abbreviations denote the following: CA and FI (Convertible Arbitrage and Fixed Income), EH (Equity Hedge and Market Neutral), EM (Emerging Markets), F (Managed Futures), GM (Global Macro), LO (Long Only), MA and DS (Merger Arbitrage and Distressed Securities), SF (Sector Financial), SH (Sector Healthcare and Biotechnology), SS (Short-Sell), SMS (Sector Multi-Sector), ST (Sector Technology).

Table 3

Declared vs. Empirically Confirmed Hedge Fund Styles, 1999–2004

	CA	DS	EH	EM	F	FI	GM	MA	SF	SH	SS	ST	SMS	LO
CA, DS and MA	79	79	17	17	5	25	0	74	0	0	0	0	0	0
EM	0	0	5	50	0	0	0	4	0	0	0	0	0	0
F	16	0	11	6	86	75	30	4	0	0	0	0	0	0
SF	0	0	5	0	0	0	0	0	83	0	0	0	0	0
SS	0	0	3	0	0	0	0	0	0	0	83	0	0	0
Other	5	21	58	28	9	0	70	17	17	100	17	100	100	100
Sum ¹	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Total ²	19	14	116	18	232	4	10	23	6	1	6	3	5	2

Source: CISDM, own calculations.

¹ In percent.

² Total number of funds in a given category.

Note: Cross-tabulation of self-declared strategies (rows) with empirically confirmed proprietary strategies (columns) for the balanced sample of funds from May 1999 to April 2004. The abbreviations denote the following: CA and FI (Convertible Arbitrage and Fixed Income), EH (Equity Hedge and Market Neutral), EM (Emerging Markets), F (Managed Futures), GM (Global Macro), LO (Long Only), MA and DS (Merger Arbitrage and Distressed Securities), SF (Sector Financial), SH (Sector Healthcare and Biotechnology), SS (Short-Sell), SMS (Sector Multi-Sector), ST (Sector Technology).

One should be careful in interpreting the similarity of table 2 and 3 as an indication that funds do not change their style over time. In order to analyze the so-called style creep,

we follow each fund individually to see whether there was a change in the SOM-based style classification from the first period to the second. Table 4 summarizes these results for

the overall sample as well as the individual fund groups. These results indicate that style creep is an issue for the hedge fund industry, with more than 23% of funds changing style over our observation period, although style creep is not as prevalent as in the mutual fund industry (see e.g. Kim et al., 2000, or Gallo and Lockwood, 1999). Overall, it is noteworthy to see that a marked difference in the tendency towards style creep exists between funds that do well in self-declaring (third row in table 4) and funds that do not (second row in table 4). The ex post observed probability of a style change is doubled (11.7% against 23.3%) in the case of hedge funds that misclassify themselves. Our research thereby refines earlier evidence on style shifts by Barès et al. (2001). In a nutshell, one is therefore tempted to conclude “don’t trust a liar.”

Looking at style creep in the different fund categories corroborates this argument. Those fund classes that

have high consistency values in their self-declared styles are less inclined to change a style over time. Futures e.g. seem to be fairly consistent in their intertemporal investment style. Emerging market funds on the contrary seem to be quite inclined to alter their style, whereas for sector financial and short-sell hedge funds the style creep tendency is high for the entire sample but improves markedly for funds that correctly self-classify. As a caveat, it should, however, be considered that not all fund categories occupy the same surface on the map. As Euclidean distance serves as a proxy for similarity, comparatively minor deviations in return characteristics appear as style creep in small fund classes such as short-sell (SS) and sector financial (SF). To sum it up, our analysis documents the presence of style creep in the hedge fund universe, with those funds that misclassify being more inclined to change style.

Table 4

Style Creep by Hedge Fund Class

	EM	SF	CA, MA, DS	SS	F
Number Style Creep ¹	7	8	31	6	27
Percentage Style Creep ²	43.80	47.10	33.70	40	12.10
Number Declared Style Creep ³	5	1	7	0	20
Percentage Declared Style Creep ⁴	35.70	16.70	14.60	0	9.50
Number Correctly Declared ⁵	14	6	48	5	210
Total ⁶	16	17	92	15	224

Source: CISDM, own calculations.

¹ Based on the mapping results for the 1994–99 subperiod, these numbers indicate the number of funds within a given category which changed their affiliation in the 1999–2004 subperiod.

² Percentage of funds (with respect to the category total) within a given category which changed their affiliation in the 1999–2004 subperiod.

³ Number of funds which correctly classified themselves in the 1994–99 subperiod but changed their affiliation in the 1999–2004 subperiod.

⁴ Percentage of funds (with respect to the number of correctly classified funds in a given category) which correctly classified themselves in the 1994–99 subperiod but changed their affiliation in the 1999–2004 subperiod.

⁵ Number of funds which correctly classified themselves in the 1994–99 subperiod.

⁶ Total number of funds within a given category.

5 Conclusion

Despite having some common features, hedge funds remain an extremely diverse asset class. There is no commonly accepted hedge fund taxonomy, as alternating long-short positions are hard to handle with traditional regression-based classification techniques. In this paper we provide a classification of hedge fund styles by detecting hedge fund groupings with similar return characteristics on the basis of Self-Organizing Maps (SOM).

Based on a ten-year sample of 2,442 dead and active hedge funds, we can identify nine hedge fund classes. Earlier findings which document a fairly adequate self-classification of hedge funds (such as Brown and Goetzmann, 2003, and Miceli and Susinno, 2003) can only be partially confirmed. Whereas managed futures and short-sell hedge funds are very consistent in their self-declared strategies, other hedge fund groups (such as fixed income, convertible arbitrage, merger arbitrage, distressed securities, sector technology and sector healthcare funds) exhibit an only moderate aptitude in correctly classifying themselves. Moreover, our results show that several declared hedge fund styles have hardly any similarities and are thus a rather useless label with very diverse return patterns incorporated in these funds (a case in point would be the equity hedge and equity market neutral category). The SOM furthermore detects similarities in a number of declared strategies such as merger arbitrage funds and distressed securities funds.

Looking at a balanced sample of funds for two five-year subperiods, we document that for the second subperiod the overall fraction of correctly self-classified funds diminishes, which implies that since 1999 style inconsistencies have been on the rise. Furthermore, our results suggest that so-called style creep is an issue in the hedge fund universe. It is readily observable in the case of funds belonging to style categories which are particularly prone to erroneous self-classification, e.g. equity hedge funds. It appears that hedge funds belonging to categories which are poor self-classifiers change their (return-based) investment style rather often whereas funds pertaining to more homogeneous categories, such as managed futures or short-sell funds, exhibit more stable and consistent investment behavior.

Our results are important for a number of purposes. The construction of fund portfolios can for instance avoid undiversified exposures to certain styles. Furthermore, a consistent classification can be useful in the construction of benchmarks and thus assist performance attribution. Moreover, fund investors might be interested in their exposure to different fund styles for risk management purposes. In terms of financial stability implications, hedge funds have become an intensely debated issue again recently. In this context, our results help in the construction of diversified (fund) portfolios and thereby enhance the risk-sharing among participants of financial markets. This ultimately increases the capacity of financial markets to absorb shocks.

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Institutional Determinants of Equity Financing in Austria

This study examines which institutional determinants are chiefly responsible for the fact that the capital structure of Austrian companies is dominated by debt. An international comparison shows that company taxation is generally not financing-neutral and, given the observed differences in equity ratios between countries, cannot be the primary factor influencing capital structure choice. Instead, the nature of creditor protections, which determine the position of investors and lenders in the event of bankruptcy, is probably a far more decisive factor. Equity ratios decline in parallel with creditor-friendly provisions across countries. Because of the predominance of small and medium-sized enterprises (SMEs) in Austria, the “Hausbank” principle plays an important role in determining capital structure. The associated intensive exchange of information between banks and companies allows borrowings to take on the functions usually performed by equity. In the future, financial market innovations and the transfer of severance pay and pension entitlements to outside institutions could have an influence on capital structure.

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Introduction

The level of equity of Austrian companies is a recurring issue in the economic policy debate in Austria. Most recently, it has once again gained relevance through discussions regarding the possible implications of the overhauled capital adequacy framework, Basel II for short, for corporate financing.

In all industrialized countries, internal funds are by far the most important source of financing for companies. Companies cover only a comparatively small portion of their net financing needs by taking out loans, issuing bonds or issuing stock to outside investors. Nevertheless, the level of equity within an economy’s corporate sector is closely linked to the smooth functioning and the stability of the financial markets. As permanent or at least long-term financing, equity performs a key financing function. Carrying risk, it forms a liquidity cushion, particularly in economic downswings, does not require regular interest payment and bears liability in the event of loss.

However, the economic policy debate generally ignores the fact that the functions (that can be) fulfilled by equity and debt in the corporate

(and overall economic) financing process are not fixed or absolute. Rather, debt can also take over functions of equity (and vice versa), at least to a certain extent. The extent to which this is possible is largely dependent on the relevant economy’s rules and norms, that is, its institutional framework. For instance, it is conceivable that, in a financial system characterized by strong relationships between companies and banks, debt could take on a larger share of the functions mentioned above that would usually be covered by equity than in a purely capital market-oriented financial system.

The implications for financial stability are not insignificant. When the specific conditions in Austria allow debt to take over the functions of equity to a greater extent than would be possible in another institutional setting, a lower level of equity within the corporate sector compared with other countries must be viewed differently in terms of risk. This study takes a closer look at the institutional conditionality of the financing and liability functions of equity and debt with respect to the specific situation in Austria.

From an accounting perspective, balance sheet equity represents the

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company's net worth as on a specific reporting date.² Beyond the legal definition, "equity" is related to the function that it performs within the company (and, at the aggregate level, in the economy as a whole).

The starting point for all considerations regarding capital structure is the seminal article by Modigliani and Miller (1958), which states that, given perfect capital markets and a neutral tax system, capital structure has no influence on firm value and the cost of capital. Under this premise, arbitrage processes would restore the original balance if different capital structures were to result in different firm values. If we loosen the restrictive assumptions on which this theory is based, we can identify the individual factors that influence corporate financing structures. For instance, the trade-off theory stresses that companies set a target leverage at which the tax advantages resulting from the additional debt just offset the costs arising from potential financial distress. The pecking order theory (Myers and Majluf, 1984; Myers, 1984) highlights the influence that asymmetrical information between investors or lenders and company management can have on capital structure. Because asymmetrical information increases financing costs, companies prefer internal over external financing. And because debt financing entails lower costs and no outside shareholders, companies prefer

debt over equity if external funds are necessary.

Viewed generally, the Modigliani-Miller theory and the literature on capital structure that builds on this theory suggest that there are different "optimal" capital structures or equity ratios depending on the "sources of market friction," that is, the institutional framework in which companies operate. Earlier international comparative analyses (and studies that focused on a single country, usually the U.S.A.) concentrated on differences in company characteristics as explanatory variables³ while recent work on capital structures since the mid-1990s has revealed the influence of institutional factors on corporate financing.⁴ These factors include the countries' tax regimes, accounting and valuation rules, bankruptcy laws, financial structures, corporate-sector ownership structures, and many other factors that cannot be covered in detail here.

Comparative studies are generally limited to the major industrialized countries and usually do not include Austria.⁵ This paper attempts to help fill the gap by taking up the key findings of international studies on this topic and examining whether and how they apply to Austria. More specifically, we have selected and examined three institutional factors that have proven to have considerable explanatory power in previous studies

² Pursuant to the Austrian Commercial Code (HGB), equity comprises the capital stock, which is referred to as share capital, nominal capital or subscribed capital, depending on the company's legal form, plus capital reserves, retained earnings and net income or loss for the year.

³ For an overview of these studies, see e.g. Harris and Raviv (1991).

⁴ The initial impetus for this greater emphasis on institutional factors came from Rajan and Zingales (1995). For a comprehensive comparative analysis of financing structures in Germany and France from an institutional perspective, see Friderichs et al. (1999). A more recent study that places special emphasis on the institutional perspective is Fan, Titman and Twite (2003).

⁵ One exception is Delbreil et al. (2000), which compares five European countries including Austria.

and for which the necessary data were available regarding their possible influence on capital structures compared with other European countries.⁶ The factors studied here are:

- Corporate tax rates,
- creditor protection provisions under the bankruptcy laws, and
- the influence of the *Hausbank* principle that characterizes the relationship between banks and companies in Austria.

With this approach, we have not taken into account differences in capital structures that result from different uses of capital (for instance, due to differences in capitalization ratios or industry structures). For this reason alone, we cannot determine whether the level of equity is “sufficient” with this paper.

This paper is structured as follows: The next section presents the level of equity of Austrian companies in an international comparison. The following section builds on this by taking a closer look at the institutional determinants of the level of equity. The final section contains concluding remarks and discusses implications for financial stability in Austria.

Equity Ratios – An International Comparison

The general tenor of the economic policy debate in Austria is that Austrian companies have a far lower level of equity than companies in other countries. However, an international comparison does not confirm this view.

The data used are drawn from the financial accounts compiled in accordance with the European System of Accounts (ESA), which contain balance sheets of the nonfinancial corporate sector⁷ (and other sectors). However, it should be noted that the financial accounts do not cover the claims of equity investors on nonfinancial assets and thus underestimate the absolute level of equity. The financial accounts approximate the share of equity with the ratio of shares and other equity to liabilities. New Cronos, the Eurostat database, contains comparative data on a harmonized basis for eleven European countries.⁸ However, data are only available through the year 2002. International comparisons of balance sheet data are plagued by numerous methodological problems. Therefore, extreme caution should be exercised when interpreting such comparative values. Another factor that should be borne in mind, particularly when analyzing internationally harmonized data sets, is the fact that, given the many difficulties involved in creating the data set, numerous revisions will inevitably have been made.

The recalculation of equity in the financial accounts for 2004 in Austria illustrates the effect of such revisions.⁹ The ratio of equity to total liabilities is now reported at around 35% instead of the previous 23%. Thus, Austria no longer has the lowest level of equity among the countries for which such data are available in New Cronos. According to these findings, the ratio of shares and other equity to total lia-

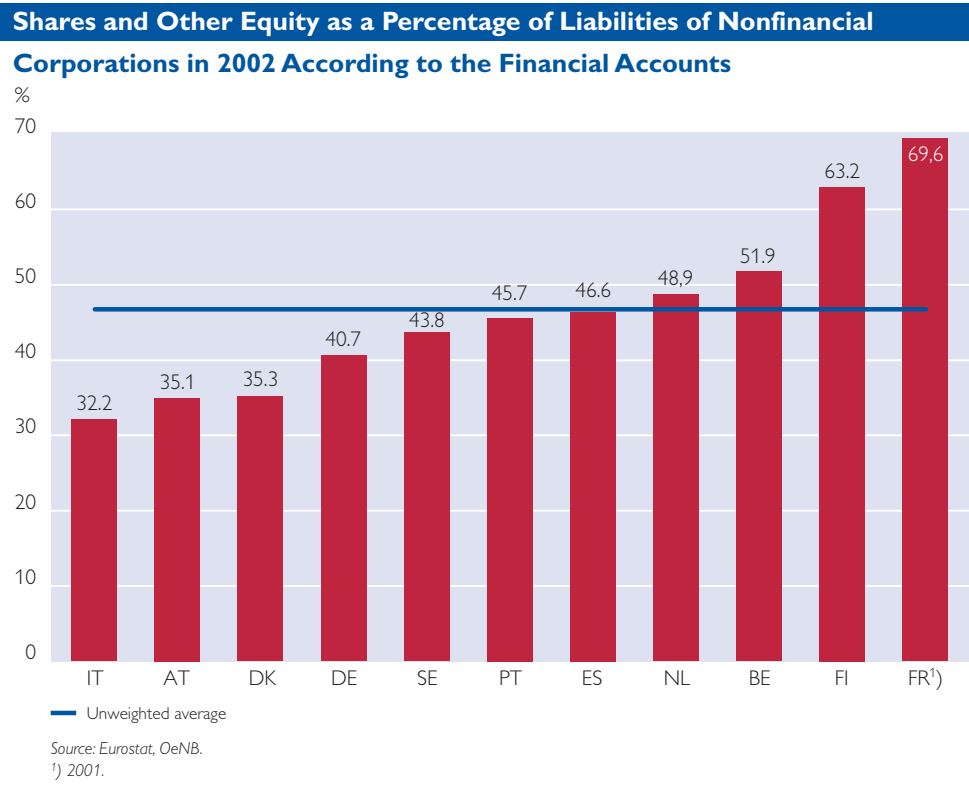
⁶ Such data are available for nine euro area countries as well as for Denmark and Sweden. See also the section “Equity Ratios – An International Comparison.”

⁷ Nonfinancial corporations pursuant to the European System of Accounts 1995 (ESA 95). These include all institutional entities that produce goods and nonfinancial services for the markets as their primary activity.

⁸ Austria, Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Portugal, Spain and Sweden.

⁹ Under this revision, shares and other equity held by companies and private households that are not deposited with Austrian banks were included in the survey. In addition, listed stocks are now presented at market values.

Chart 1



bilities of Austrian companies in the aggregate is still below the (unweighted) European average of 47%, but – in the light of all of the reservations associated with the interpretation of the data – it is not low (see chart 1).

A variety of company data (for the same EU Member States for which financial accounts data are available in New Cronos¹⁰ can also be found in

the BACH database.¹¹ These data are drawn from company balance sheets. Due to considerable methodological and conceptual differences,¹² the BACH database provides equity ratios¹³ for the individual countries that differ considerably from the financial accounts values in terms of absolute levels although the BACH database does not contain aggregate data for the entire corporate sector but rather

¹⁰ The database also includes data for the U.S.A. – which, however, are classified according to a different size structure – and for Japan.

¹¹ Bank for the Accounts of Companies Harmonised. Compiled by the European Commission (DG ECFIN) in collaboration with the European Committee of Central Balance Sheet Offices.

¹² The valuation is based on book values. In addition, although the accounting rules of the EU Member States are already partially harmonized, accounting standards in the individual countries are not fully comparable without reservation. Thus, the survey methods still vary considerably due to the differing legal and tax situations. Finally, for most of the countries, the BACH database is based on samples of companies – some more representative than others – which are prepared in accordance with a harmonized concept.

¹³ Defined as net assets plus shares and other equity as a percentage of the sum of net assets and liabilities.

only for various industry sectors¹⁴ and size classes.¹⁵ These data are also available only for 2002 or earlier for most countries.

Bearing in mind that the values in the BACH database must necessarily differ considerably from those of the financial accounts, we can use them to show equity ratios by sector and size class. At the sector level, there is nothing particularly distinctive about the figures for Austria. However, what does stand out is the striking

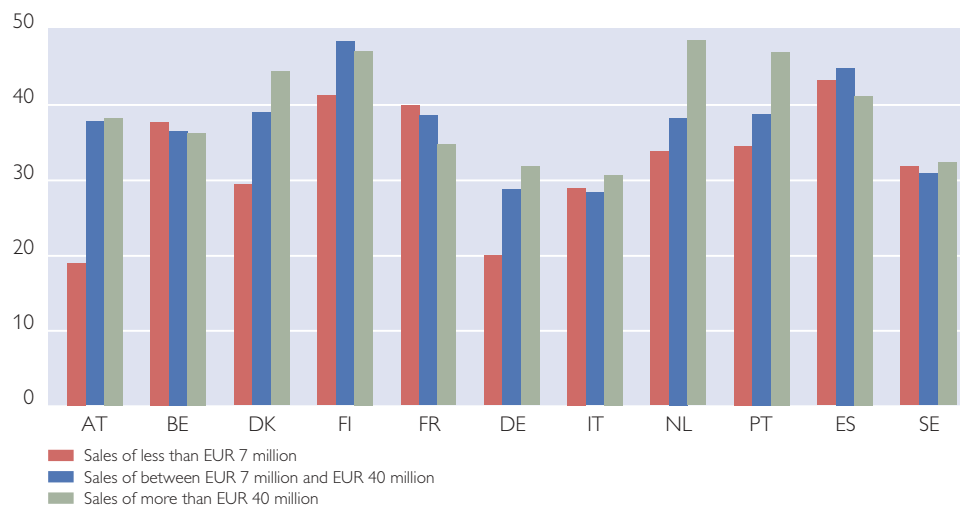
difference in the capital structures of large and small companies in Austria. This difference is not apparent in all countries, as chart 2 illustrates for the manufacturing sector. The situation is similar in other sectors of economic activity. In some other European countries, the difference between large and small companies is minimal. In France, Spain and Belgium, the equity ratios of small companies are even higher than those of large companies.¹⁶

Chart 2

Equity Ratios in the Manufacturing Sector

in 2002 or earlier (depending on data availability)

% of balance sheet total



Source: EU, BACH database.

We can derive two things from this: First, small companies do not necessarily have less equity than big ones. Second, the relatively low level of equity in the Austrian economy as compared with other countries applies primarily to small companies – if it applies at all. Among small companies, the difference between Austria and

the unweighted mean of the countries presented here is nearly 14 percentage points, whereas the difference among large companies is only slightly more than 1½ percentage points (the value for mid-sized companies is even somewhat above the unweighted mean). Thus, the equity ratios of large companies are in the middle range of the

¹⁴ At present, it contains aggregate data from annual financial statements for 23 sectors and subsectors, of which 10 are in manufacturing.

¹⁵ Sales of less than EUR 7 million, of between EUR 7 million and EUR 40 million, and of more than EUR 40 million.

¹⁶ However, it should be noted that these differences may be due in part to the different sample sizes.

Table 1

Tax Burdens at the Company Level – A European Comparison for 2001

in % Countries	Statutory tax rates for corporations ¹⁾	Effective average tax burden of investment projects using	
		New equity ²⁾	Debt
Belgium	40.17	39.10	25.80
Denmark	30.00	30.70	21.00
Germany	39.35	38.70	27.70
Spain	35.00	35.20	23.30
France	36.43	39.00	26.80
Italy	40.25	28.70	25.50
Netherlands	35.00	35.20	23.30
Austria ³⁾	34.00	30.70	22.60
Portugal	35.20	34.80	23.00
Finland	29.00	30.00	20.20
Sweden	28.00	26.00	17.10

Source: European Commission (2001).

¹⁾ Including surcharges and local taxes.

²⁾ Self-financing and equity financing.

³⁾ Beginning in 2005, the corporation tax rate is 25%. The tax burden of investment projects that are financed using equity is thereby reduced.

European countries examined here. Therefore, the question to be studied here can be specified as follows: To what extent do institutional characteristics make lending to small companies easier and/or make injecting outside equity into SMEs more difficult?

Institutional Factors

Company Taxation

The irrelevance theory postulated by Modigliani and Miller (1958), that firm value is independent of capital structure, was put forward under the assumption that companies are not subject to taxation. Consequently, many studies have focused on examining the influence of the tax regime on capital structure choice (for an overview of these studies, see Graham,

2003). In general, the results of these studies suggest that taxes are a significant determinant of the costs associated with equity and debt and, therefore, exert an influence on a firm's value. In order to maximize firm value, companies try to keep the costs of capital as low as possible by choosing forms of financing that entail the lightest tax burden.¹⁷

In Austria, company taxation is not neutral in terms of financing. Corporate borrowing is given preferential treatment over equity financing, as the interest paid on borrowed funds can be deducted from earnings for tax purposes. This narrows the company's tax base and, thus, reduces the tax burden. Similar provisions for equity do not exist.¹⁸ Dividends and retained

¹⁷ Aside from company tax, personal income tax should also be taken into account. This applies primarily to small and mid-sized companies that generally do not have access to the international capital markets as a source of financing due, among other things, to the small demand volume and must therefore depend on the domestic supply of capital. In such cases, domestic income taxes influence the costs of capital and companies must minimize not only taxes on earnings but also taxes on investors' capital gains by making the right capital structure choice. Since the shareholders could be subject to different tax rates, it is usually not possible to take this factor into account to the extent necessary. However, for Austria, see also footnote 25.

¹⁸ The tax reform in 2000 introduced the deductibility of interest from increases in equity as an expense, but this provision was eliminated again with the 2004/05 tax reform. For more on this topic, see the section "The Impact of Changes in the Institutional Framework on the Level of Equity."

earnings do not narrow the tax base and, thus, the company pays higher taxes.

The lack of neutrality of taxation when it comes to corporate financing is not unique to Austria. According to a study on company taxation conducted by the European Commission (European Commission, 2001), debt is the most tax-efficient source of financing for corporations throughout the EU. Table 1 presents a comparison with company taxation rates in EU Member States. The first column shows the corporation tax rates for each country and the subsequent columns show the effective tax rates for the different forms of financing.¹⁹

In this comparison for 2001, Austria has the lowest nominal tax rate (34%) after Sweden, Finland and Denmark while Italy, Belgium and Germany have the highest rates. As is evident from Table 1, debt is the optimal form of financing for investments. In all countries, the effective average tax burden on debt is lower than that on equity financing. Sweden has the lowest tax burden in the case of debt financing (17.1%) while Germany has the highest effective tax rate at 27.7%. In Austria, the effective tax rate for debt financing is 22.6%. When new equity is used as the source of financing, Belgium has the highest effective tax rate (39.1%) and Sweden the lowest (26%). With an effective rate of 30.7%, Austria is slightly below the mean when it comes to this form of financing.

In general, a high corporate tax rate should promote debt financing. However, it is important to bear in

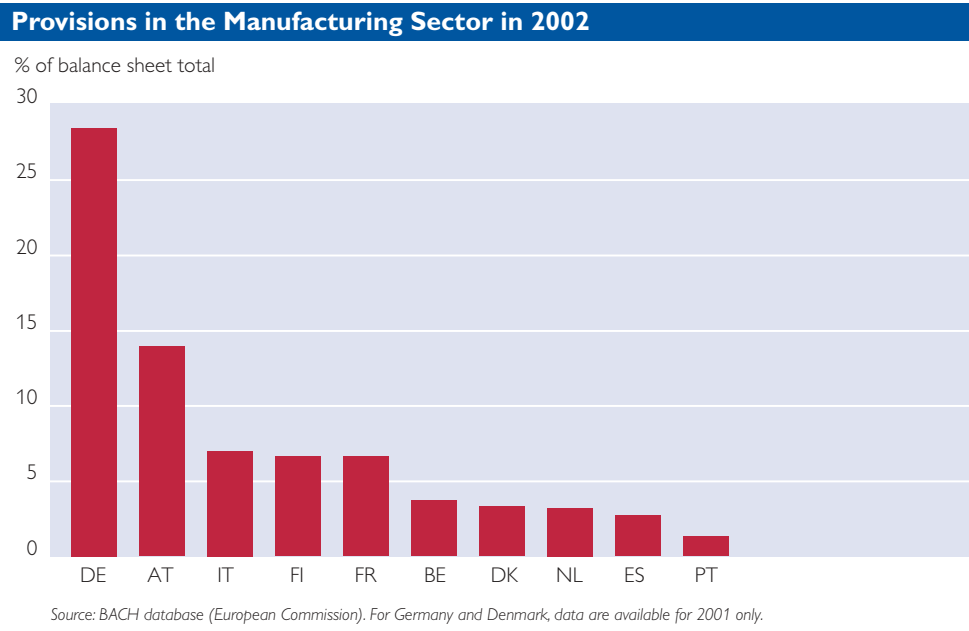
mind that a high tax rate usually goes hand in hand with a narrower tax base (European Commission, 2001). Moreover, growing debt entails tax savings as well as costs since the probability of bankruptcy increases as the debt ratio rises. Thus, there are different optimal capital structures depending on the country-specific corporate situations and, so, the influence of company taxation on financing decisions is relative. The international comparison of capital structures, in which equity ratios in some countries are over 50% despite the general tax advantages of debt, suggests the same.

The significance of the tax advantages of interest on borrowed funds declines when other options for tax deductions are available to a company. For instance, transfers to provisions are viewed as an expense for tax purposes and, thus, reduce taxable earnings. Under tax law, provisions are contingent liabilities to third parties and, thus, debt. As chart 3 shows, transfers to provisions for severance pay and pensions, as provided for under tax law, have a considerable influence on the shape of capital structures within Austria's corporate sector. At least in manufacturing, the sector of economic activity with the greatest value added, Austria has the highest level of provisions after Germany. In other sectors for which comparable data are available, such as energy or transport, Austria has a lower level of provisions than other countries.

Pension provisions play a special role in capital structure. They are available to the company for the long term, without interest, and thus come

¹⁹ The effective tax burden of hypothetical investment projects is used to permit comparison of the tax burdens at the international level. Both the relevant statutory tax rates and the most important tax provisions regarding the determination of taxable earnings are used to calculate the effective tax rates.

Chart 3



close to equity in this respect.²⁰ However, in Austria, provisions are concentrated on mid-sized and large-scale companies. For example, according to the OeNB's financial ratio analysis for 2003, provisions among large-scale enterprises in the manufacturing sector accounted for 13.4% of the balance sheet total while they accounted for only 4.4% among small enterprises. The main reason for the sharp size-specific differences in provisions is likely to lie in the differing importance of pension provisions. Small companies are not large enough to establish direct, employer-based pension schemes (Kaufmann, 1997).

Creditor Protection Provisions under the Bankruptcy Laws

Some comparative analyses of capital structure have highlighted the differ-

ing legal positions of investors and lenders in the event of a company's insolvency as an important factor for the differences in the levels of equity in various countries.²¹ Creditors' legal position in insolvency proceedings ultimately reflects the economic policy aims of bankruptcy laws.²² A country's bankruptcy laws provide for both the reorganization and the liquidation of bankrupt companies. However, the importance placed on one or the other solution varies considerably by country (Smith and Strömberg, 2004), so that we can differentiate between debtor-friendly and creditor-friendly bankruptcy laws.

In countries with debtor-friendly bankruptcy laws, the focus is on maintaining the company that is threatened with insolvency as a going concern. Here, satisfying creditors is a lesser

²⁰ Pension provisions do not entail interest charges with a direct impact on liquidity. However, to determine the present value of the future receivables, a discount rate has to be used.

²¹ See Rajan and Zingales (1995), Friderichs et al. (1999), Delbreil et al. (2000), Rivaud-Danset et al. (2001) among others.

²² However, the economic policy aims do not say anything about the likelihood or number of bankruptcies, which vary widely by country.

priority. This form of bankruptcy law is especially pronounced in France, where secured creditors are not only not given priority in bankruptcy proceedings but creditors' rights can even be suspended temporarily in order to prevent the premature liquidation of the insolvent party's estate (Smith and Strömberg, 2004, Delbreil et al., 2000). In addition, creditors' possibilities of realizing loan collateral are severely limited, which means that such securities are practically worthless in the event of bankruptcy (Friderichs et al., 1999). In countries where bankruptcy laws put less emphasis on creditor rights, banks react to this lack of protection for collateral by granting only small loans and diversifying their loan portfolios as widely as possible (Friderichs et al., 1999).

Austria (and Germany), on the other hand, have very creditor-friendly insolvency laws. Here, the primary aim is to "bring about the fair and best possible satisfaction of the creditors" (Jahn, 1998). In bankruptcy proceedings in Austria, secured cred-

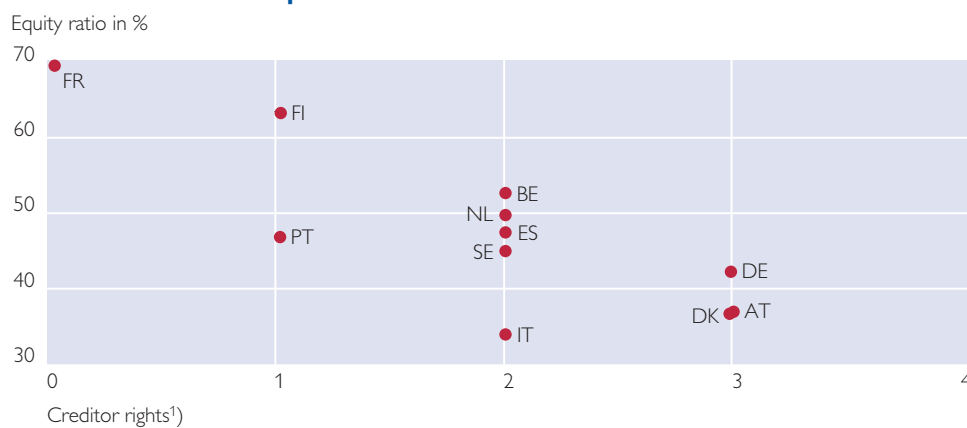
itors have preferential rights to assets in the bankrupt's estate that are encumbered with rights in rem (e.g. liens, pledges) (Jahn, 1998). Thus, for example, the assignment of receivables represents a greater security than it would under a legal regime in which creditor rights are subordinate to company reorganization and banks can therefore accept levels of debt that would be deemed excessive in countries whose laws provide for less creditor protection. At the same time, debt can take over more of the financing and liability functions of equity and bank loans can be expected to play a greater part in corporate finance in countries where the creditor's position is well secured.

Whether an insolvency regime is more creditor-friendly or more debtor-friendly can be assessed qualitatively more so than it can be measured quantitatively. As part of a highly regarded study on the legal factors determining financing structure, La Porta et al. (1998) developed an index that attempts to illustrate the legal

Chart 4

Equity Ratios of Nonfinancial Corporations and Creditor Rights –

An International Comparison



Source: La Porta et al. (1998), Eurostat.

¹⁾ Scale from 0 to 4, with 4 denoting the highest level of creditor protection.

protection of elementary creditor rights in the event of a company's insolvency and the reorganization procedure based on four features.²³ The work revealed a broad correspondence between the values of this index and the share of the companies' balance sheet total that is accounted for by equity (see chart 4). France, with its particularly debtor-friendly insolvency laws, has the highest equity ratio of all the countries studied while Austria, Germany and Denmark are at the other end of the spectrum.

The Hausbank Principle

The third factor that should be studied with respect to its implications for capital structure in Austrian companies is the *Hausbank* principle, which characterizes the relationship between banks and companies in Austria (and Germany). A close, long-standing relationship between a company and the financing bank can contribute significantly to reducing the agency costs that result from asymmetrical distribution of information between financiers and companies both before and after the financing decision is reached. Before providing funds, banks that have a close relationship with their customers can better tell good risks from bad. After funds are provided, the close relationship between bank and customer reduces the company's information disclosure costs. The account relationship alone supplies the bank with telling information; and regular contacts and reports further reduce the costs of information and often make information about the company's current situation and develop-

ment accessible in the first place. This regular exchange of information not only gives the bank better, less cost-intensive insight into the company's financial situation but may also give the bank access to collateral that does not appear on the balance sheet. Closer monitoring and control provided by banks could make more debt financing available to companies (Rajan and Zingales, 1995).

At the same time, the implicit ties that develop between banks and companies also make it easier to establish arrangements that cannot be made contractually *ex ante*. Thus, the bank can render services that can be described as crisis or liquidity insurance according to Hackethal and Schmidt (2000). If a company's internal funds are not sufficient to finance an investment or if insolvency is looming, the bank can come to the company's aid by injecting liquidity or supporting the company's reorganization.²⁴

Although it is difficult to directly observe the existence of a *Hausbank* relationship from the outside – particularly because it works through informal relationships – the practice of long-standing loyalty to one bank (or banks' loyalty to their customers) can be assumed in Austria. Empirical evidence suggests that *Hausbanks* have a higher degree of continuity in their financing behavior. Valderrama (2001) interprets a company's taking out a high share of loans from a single bank as an indication of the existence of a *Hausbank* relationship and concludes that companies that have at least half of their total debt through a single bank are noticeably less affected by

²³ (1) No automatic stay on assets; (2) secured creditors paid first; (3) restrictions for going into reorganization; (4) management does not stay in reorganization.

²⁴ What is more, this type of "exclusive" financial relationship also makes it difficult for companies to switch to a different form of financing (or even simply to a different bank) (Kaufmann, 1997). This could also be a factor keeping equity ratios down in countries with a strong "Hausbank" system.

monetary policy measures. Similarly, Elsas and Krahnert (2004) show, for Germany, that banks with *Hausbank* status tend to increase their lending considerably when a borrower's credit standing deteriorates moderately whereas banks that do not have close relationships with their customers tend to maintain or reduce their lending to such borrowers.

The way banks perform their financing function also influences which aspects of financing a loan can fulfill. In countries with a less pronounced *Hausbank* principle, equity must always be held available so that it can quickly be used to adjust liquidity in a crisis situation. In countries like Austria and Germany, companies can fall back on short-term loans or overdraft facilities as needed (Friderichs et al., 1999). In this way, long-term loans in Austria can partially perform the function of equity as a long-term financing instrument and, to the extent to which the bank stands by a company in a crisis situation, even the risk-bearing function. For this reason, the solvency of companies in countries, like Austria, that have a strong *Hausbank* tradition is less dependent on the balance sheet than it is in countries with a capital market-oriented financial system. This, in turn, increases companies' creditworthiness and, thus, their ability to borrow.

Thus, in countries with a pronounced *Hausbank* system, a lower equity ratio on the one hand and a sharper difference between small and large enterprises on the other hand is to be expected. The financing of smaller enterprises is especially favored by the regular exchange of information between borrowers and banks. Very little public information is usually available about smaller firms and, due to the firms' small size, it is

usually relatively expensive to obtain information. Moreover, in the case of smaller, owner-operated companies, banks often view their business relationship to the company and the owner as a single entity and value the owner and the company as a whole. In such cases, banks will evaluate the owner's personal financial circumstances (including those assets that are not brought into the company) and accept assets that are the owner's private property and/or personal guarantees as collateral (Berger and Udell, 1998). This supports the notion that smaller companies tend to report less equity on their balance sheets when there is a particularly intensive relationship between the company and the lending bank.

The Impact of Changes in the Institutional Framework on the Level of Equity

In recent years, changes have been made to the institutional framework. New tax rules are aimed at treating equity and debt equally while the increased establishment of pension and severance funds is reducing the importance of pension and severance pay provisions on the balance sheet. Austria's integration into the European capital market is making new sources of financing available to Austrian companies. At the same time, Basel II could place the traditional financing relationships between companies and banks on a different foundation. It seems almost inevitable that these changes will leave their mark on the capital structure of Austrian companies.

In Austria, lawmakers have recently taken several steps in an effort to eliminate some of the differences in the taxation of the forms of capital. For example, as part of the tax reform

in 2000, the deductibility of interest on debt was complemented by the deductibility of fictitious interest from increases in equity capitalization, but this provision was eliminated again with the 2004/05 tax reform. At the same time, as of the start of 2005, the corporation tax rate was reduced from 34% to 25%, which improves the tax treatment of equity financing for corporations in absolute terms but does not alleviate the less favorable treatment of equity compared with debt.²⁵

The reduction of the tax rate on retained earnings of up to EUR 100,000 per year by one half for sole proprietors and partnerships that was introduced with the first stage of the 2004/2005 tax reform will temper the lack of financing neutrality in the Austrian tax system (Breuss et al., 2004), but a long-term increase in equity will not likely result. First, the change is limited to sole proprietors and partnerships that obtain their income from agriculture and forestry or from trade or business and practice balance sheet reporting. The liberal professions are excluded from applying these provisions. Second, the new provisions only promote internal financing, not borrowing or equity financing (Staringer, 2003). Moreover, it is doubtful whether the small companies targeted by this provision have the necessary earning power. The effectiveness of fiscal instruments for strengthening self-financing power in this segment is necessarily limited as the owner-managers must use a considerable portion

of their earnings to finance their own living (Breuss et al., 2004).

Stronger effects on the capital structure of Austria's corporate sector are likely to come from changes in severance pay and pension provisions. The establishment of severance and pension funds affords companies an opportunity to transfer their employees' claims to severance pay and pensions to institutions specifically designed for this purpose. For example, the Act governing employee retirement and severance pay (*Betriebliches Mitarbeitervorsorgegesetz*) eliminates severance pay for employment relationships that are established after 2002 and replaces it with ongoing payments by the employer into a severance fund. For employment relationships begun after 2002, no provisions are therefore established for severance pay. At the same time, it was made possible to transfer entitlements to severance pay from employment relationships established before 2003 to a severance fund. In the case of company pensions, another trend reversal is observable. Company surveys show that the importance of pension funds is increasing (Url, 2003). As a result, the new legal framework for severance pay and the replacement of direct benefit commitments in the form of pension provisions with an increased use of pension funds outside the company are reducing the balance sheet totals and will likely result in a lower debt ratio in the long term.

In addition, the *Hausbank* system may also undergo changes. In the past few years, Austria's increasing integra-

²⁵ If we also take income tax into account, equity and debt financing are now placed on an equal footing from the perspective of the investor/lender if the company does not pay dividends and the shareholders do not sell their shares within the period of capital gains tax liability for short-term gains (Frühwirth and Schwaiger, 2005). However, since non-tax factors such as agency costs and the signaling effect of dividends continue to prompt companies to pay dividends, equal treatment of the forms of financing is likely to be relevant only to a few companies.

tion into the international financial markets and the resulting trend toward disintermediation has already changed financing behavior, for example, in that Austrian companies have increasingly issued corporate bonds (Waschiczek, 2004). At first view, one might expect the financing of small and mid-sized companies to be less affected by these changes because of the companies' size and because selecting new forms of financing would entail high research and information-gathering costs. However, it should be borne in mind that financial innovations could also open the capital markets to small and mid-sized companies (Mooslechner, 1999).²⁶

Finally, Basel II could also change the relationships between companies and banks. Lending to small and mid-sized companies may not be influenced directly since allowances are made when calculating the capital position for loans with a volume of up to EUR 1 million and for companies that report annual sales of up to EUR 50 million. But if the assessment of a company's creditworthiness is focused more keenly on financial data than before and qualitative areas of credit assessment that have formed the core of the *Hausbank* relationship until now begin to recede into the background, lending could nevertheless be affected.

Conclusion

This article has attempted to examine the level of equity of Austrian companies under institutional considerations. Taking into account the high level of uncertainty with respect to the data available, an international comparison shows that, in the aggregate, the level of equity in Austria is not above aver-

age but not low, either. A considerable difference between Austrian firms and firms in comparable European countries can be identified only among small companies. Furthermore, we have shown that the capital structure of a corporate sector is the product of several institutional factors. In all likelihood, the tax system in Austria does not disadvantage equity financing any more than the tax systems in other countries. Rather, an overview of company taxation shows that no country within the EU has a tax system that is neutral in terms of corporate finance.

More important is the influence of the specific provisions of bankruptcy law and the *Hausbank* system in Austria, which make it easier for firms to borrow funds (without making it harder for them to issue common stock). The result is that the equity ratio reported by (primarily smaller) Austrian companies provides only an incomplete picture – especially in an international comparison. The equity ratio does not show the private assets of company owners, which banks can access more easily in Austria than in countries with debtor-friendly bankruptcy laws. It also does not reveal the greater willingness of *Hausbanks* to continue to provide financing even in crisis situations. In this respect, the institutional circumstances reduce Austrian companies' need for equity compared with that of companies in other countries.

Thus, the relevance of a below-average level of equity becomes relative, particularly with respect to financial stability in Austria. When, owing to the more favorable position of banks in the event of insolvency and to the strong *Hausbank* system, loans

²⁶ For example, asset backed securities with small lending volumes or the bundling of small bond issues.

are not immediately called due in a crisis situation, debt can take over at least some of the financing and liability functions that could be only performed by equity in a different institutional environment. According to the pecking order theory, we can expect companies to prefer debt over the infusion of equity from outside. Because the institutional framework facilitates lending and borrowing, it also increases companies' financing options. Since equity is the most expensive form of (external) financing given its specific performance components, cost considerations are also affected.²⁷

At the same time, *Hausbanks* help smooth fluctuations in the provision of funds to the corporate sector. In macroeconomic terms, the result is a smoothing of business cycles.

Finally, we should point out that all statements should be viewed with the reservation that only a few of many institutional factors could be analyzed within the scope of this paper.

For example, we have not looked at the impact of interest group-related influences on financial market developments. Hahn (2002) concludes that, in the past, Austria lacked a critical mass of companies capable of tapping the capital markets that would have been needed to more forcefully promote the risk capital market as a source of corporate finance among policymakers. Instead, the market is dominated by small and mid-sized companies that are critical of equity financing because they rather avoid the influence of third parties on their

management and therefore prefer the external financing offered by the credit market.

Another factor that was not examined here was the effect of different accounting and valuation rules. For example, the principle of prudence established under Austria's accounting rules stipulates that assets must be valued at historical cost, which favors the buildup of hidden reserves and tends to underestimate the equity reported on the balance sheet.

The intended use of the funds was also completely left out of this analysis. However, there is no doubt that it plays a significant role in determining the capital structure of a company (or, at the aggregate level, of an economy). Companies operating internationally are likely to have a different risk profile than companies that are focused primarily on the local market. Research-oriented market leaders are likely to be financed differently than mass producers that are in the process of catching up at the international level.

Also, we have not looked at the influence of the capital supply in any detail. However, at the latest since Austria's participation in EMU, the capital supply is now hardly subject to Austria-specific restrictions and the growing importance of institutional investors is likely to have had similar effects. A more detailed examination of all of these factors is needed before the question of what is a suitable level of equity for Austrian companies can be answered conclusively.

²⁷ Of course there is, on the other hand, at least the theoretical risk that companies will cover their need for equity through borrowing.

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Demographic Developments, Funded Pension Provision and Financial Stability

Stefan W. Schmitz¹

The following study analyzes the impact of demographic developments in Austria on the long-term average real interest rate, funded pension provision and the implications of demographic developments for the stability of the financial system. The key results of this study are twofold: (1) Households' net supply of savings and the demand for capital by the corporate sector both need to be integrated into the empirical and theoretical analysis of the impact of demographic developments on financial markets. (2) In addition, funded pension provision is exposed to demographic risks.

The impact of demographic developments on financial stability is frequently discussed in the economic literature using the “asset meltdown” hypothesis. According to this theory, an increase in the share of pensioners as a percentage of the total population triggers a decline in asset prices, as pensioners dissave in old age and, owing to this demographic development, there might be fewer economically active persons who act as buyers in the capital markets. Following a methodological critique of this hypothesis, an alternative conceptual framework which is better suited to the current object of investigation is presented. Within this framework, variables are identified that are of cardinal importance for the relationship between demographic developments and the stability of both financial intermediaries and financial markets. Since some of the effects identified are diametrically opposed to each other, their relative significance within the concep-

tual framework is examined by means of quantitative simulations. The implications of the theoretical and quantitative results for both the stability of financial intermediaries in the arena of funded pension provision and financial stability will be analyzed in the final section. The key results of this study are twofold: (1) Households' net supply of savings and the demand for capital by the corporate sector both need to be integrated into the empirical and theoretical analysis of the impact of demographic developments on financial markets. (2) In addition, funded pension provision is exposed to demographic risks.

Demographic Developments in Austria

According to Statistics Austria (2003), the Austrian population is projected to grow modestly from 8.12 million to 8.21 million until 2050 thanks to positive net migration, in particular (table 1).

Table 1

Age	Population Growth in Austria from 2000 to 2050					
	Population structure in 1,000			Population structure in %		
	2000	2020	2050	2000	2020	2050
0 to 14	1,351	1,180	1,087	16.64	14.17	13.25
15 to 65	5,510	5,455	4,782	67.85	65.50	58.27
Over 65	1,260	1,693	2,337	15.51	20.33	28.48
Total population	8,121	8,328	8,206	100.00	100.00	100.00

Source: Statistics Austria, 2003.

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Despite positive net migration, a dramatic change in the population's age structure is expected. The share of people of working age (15 to 65) will fall from 67.85% in 2000 to 65.5% in 2020 and amount to only 58.27% in 2050. In addition, the share of children and adolescents (aged 0 to 14) will decline from 16.64% (in 2000) to 14.17% (in 2020) and fall to 13.25% in 2050. According to Statistics Austria, the birth rate is expected to be constant between 2002 and 2050 with 1.4 births per woman aged 15 to 45. Until the year 2050, life expectancy at birth will increase from 75.8 years (for men) and 83 years (for women) in 2002 to 80.2 and 88 years, respectively. The life expectancy of 60-year-olds will rise from 20.1 (for men) and 24.2 (for women) to 25.5 and 29.4 years, respectively.

Two demographic factors are of particular interest for the following analysis: (1) the long-term average rise in the number of economically active people (i.e. employees and the self-employed) and (2) the ratio of not economically active persons (including the unemployed) to economically active persons. The average rise in the number of economically active persons over the respective preceding 20-year period will fall steadily from

0.3% (in 2000) to -0.16% (in 2030) to then rise back slightly to -0.05% by 2050. The ratio of not economically active to economically active persons will increase from about 83% (in 2000) to some 97% in 2050.

Funded Pension Provision in Austria

What is the extent of funded pension provision in Austria? Table 2 shows that, in the period from 1999 to 2004, passbooks on which a total of some EUR 115 billion were held were the most important savings vehicle (23.68 million savings accounts of domestic nonbanks, of which around 5.67 million were building loan contracts). However, no distinction can be made between long-term pension provision in the form of the passbook and short-term saving motives. Traditional life insurance with some 9.5 million individual and group policies (in 2003) and a premium reserve fund of around EUR 40 billion (in 2004) are widely used. Since 1999, pension products geared more to capital markets have gained in relative importance. In particular, demand for retail funds (about EUR 70 billion, including some 60,000 contracts of subsidized personal pension schemes (*Zukunftsvorsorge*) offered by investment

Table 2

Key Long-Term Saving Vehicles in Austria from 1999 to 2004

EUR million	1999	2000	2001	2002	2003	2004
Pension funds (total assets)	7,300	7,833	8,037	7,876	9,122	10,126
Severance funds (assets of collective investment funds)	–	–	–	–	146	363
Life insurance premium reserve funds ¹⁾	28,323	31,192	33,802	35,656	37,645	40,771
Savings excluding building loan contracts	105,869	102,942	108,180	110,481	114,472	112,806
Building loan contracts	15,998	16,278	16,644	16,504	16,923	17,680
Retail funds ²⁾	–	54,038	58,319	57,492	64,100	70,816
Of which pension investment funds	–	217	179	238	373	711

Source: FMA, OeNB, OeKB, Austrian occupational pension fund association, adapted by FMA 2004;

¹⁾ Estimated reinsurance values for 2004. Domestic insurance companies excluding small mutual insurance companies.

²⁾ Retail funds minus investment by mutual funds in domestic investment certificates.

companies, KAGs), unit and index-linked life insurance policies (some EUR 3.3 billion, including around 420,000 subsidized personal pension contracts offered by insurance companies) and pension funds (about EUR 9.6 billion and some 413,000 beneficiaries, including prospective beneficiaries) has grown following the debate on the stability of the public pension system. At EUR 299 million, the volume of severance funds is still low despite some 2.2 million qualifying periods, as these funds were introduced only in 2003.

The volume of funded pension provision (in particular, pension funds, severance funds and subsidized personal pension schemes) is therefore relatively high overall, even if accumulated contributions and the number of contracts remain well below those of savings and building loan contracts, as many products were launched only recently. In the next few decades, however, funded pension provision will make considerable advances and gain in relative importance for financial stability.

To analyze the impact of demographic developments on financial stability, there are basically two starting points: (1) Consumption by not economically active persons arises from claims involving an economic interest and social security claims on national income that is generated by economically active persons, thereby inducing nonconsumption by the latter – provided the consumption is not funded by investment income. (2) The decline in the number of economically active persons impacts on economic growth, capital productivity and the demand for capital. The first correlation is generally discussed primarily within the

framework of the “asset meltdown” hypothesis and largely in isolation from the second. In this study, a conceptual framework is developed to facilitate the integrated analysis of both these effects.

The “Asset Meltdown” Hypothesis

The “asset meltdown” hypothesis is based on expectations about the medium- to long-term momentum of both total saving by economically active persons and dissaving (due to consumption) by pensioners. The impact of these expectations on financial markets is examined within the conceptual framework of overlapping generations (overlapping generations or OLG models).² According to this model, the baby boom generation – i.e. the wave of children born in 1957–70 – will be in a very productive phase of their working life in the period from 1990 to 2020, which will be marked by relatively high income and, consequently, relatively high net savings. Insecurity about future pensions funded by public contribution systems will also boost net savings. In the period from 2020 to 2030, the baby boom generation will enter retirement. Baby boomers will defray a portion of their consumption from savings invested for this purpose and thus sell their assets. Since the next generation to enter a particularly productive phase of economic activity in this period will be smaller owing to demographic developments, the balance between buyers and sellers will be skewed toward the latter. When the baby boom generation reaches retirement, this will trigger a slump in the prices of assets traded in financial markets. The impact of

² *Inter alia* Toporowski (2000); England (2002); Geanakoplos et al. (2002).

demographic developments on both the demand for real capital and marginal capital productivity is not accounted for by the “asset meltdown” hypothesis.

The “asset meltdown” hypothesis is considered to be a highly unlikely scenario in economic literature, as pricing in financial markets is seen to have sufficient flexibility to anticipate the price effects arising from baby boomers’ dissaving. Instead of a one-off price effect arising from the transition between generations, price adjustment occurs over a relatively lengthy period, thereby preventing a sudden slump in prices. Many critics of the “asset meltdown” hypothesis contend that equity prices are determined primarily by the discounted present value of dividends expected in future and therefore do not depend on dissaving by pensioners. However, this counterargument does not hold water. In fact, the effect of falling equity prices also arises within the analytical framework of this study, as the discount factor and expected future returns are not independent of demographic developments.³

The empirical evidence for a historical correlation between demographic developments and *financial market prices* is not clear.⁴

- Econometric models generally disregard the interaction between the supply of savings and the demand for capital.⁵ However, the latter is not independent of the rise in economically active persons, a

demographic variable. If the demand for real capital is not integrated into the model, the corresponding effects will be wrongly interpreted as effects arising from pensioners’ dissaving. The econometric models cannot differentiate between shifts in the supply curve along the demand curve and shifts in both curves. An equation of the demand for capital, accounting for the impact of demographic developments on the demand curve, should also be integrated into these estimations.

- Price formation in financial markets is frequently modeled as based on rational expectations. Demographic developments can be extrapolated relatively far into the future as soon as the relevant cohorts are born. This is why the price effects arising from the retirement of the baby boom generation should have already taken place many years ago. However, there is no empirical evidence for this.⁶
- Frequently, in addition to demographic variables, control variables (e.g. the long-term real interest rate, dividend growth) are included in the estimation equations.⁷ Since, however, these variables are not independent of demographic developments, the estimations of the parameters and their standard deviation can be distorted owing to the multicollinearity of the independent variables.

³ Lueg et al. (2003).

⁴ Poterba (2004).

⁵ These econometric analyses are implicitly based on an interest rate theory, according to which real interest rates and asset prices are determined by both saving and dissaving decisions within the household sector and not in capital markets by households’ net savings and the corporate (and public) sector’s demand for capital as in the neoclassical loanable funds theory, or in money markets as in accordance with Keynesian theory.

⁶ Davis and Li (2003); Poterba (2004).

⁷ Davis and Li (2003).

- The specification of the variables representing demographic development (e.g. absolute or relative cohort sizes, average age) is not trivial and strongly influences the results.
 - In addition, the growing global integration of financial markets since the end of the Bretton Woods system does not facilitate this analysis, as the impact of national demographic developments on national equity and bond prices is becoming weaker.⁸ This is why, in empirical studies, this phenomenon should be explicitly accounted for in the estimation equations.
- Furthermore, the baby boom generation's expected *dissaving behavior* is not undisputed empirically. Empirical studies on a correlation between demographic developments and aggregated saving behavior at a microlevel do not provide any clear results.⁹
- This lack of clear results is primarily due to the fact that identifying the effect of demographic changes requires very long horizons of observation. As a result, the number of observations appears to be much higher than the number of statistically utilizable independent observations actually is, so the effective degrees of freedom are reduced.¹⁰ Saving behavior depends on several factors that evolve far more frequently than demographic developments and that can obscure the impact of these developments. In particular, the institutional framework of saving behavior (e.g. confidence in the public pension system, government measures to promote wealth accumulation) has undergone a sea change since 1950.
 - In addition, in the empirical analysis of saving behavior, different specifications of demographic variables have an impact on the results.
 - The inclusion of bequest motives also makes the analysis of saving behavior in old age problematic. Bequests can increase the total savings of pensioners and reduce that of potential heirs.
 - The small size of annuity markets generates a further saving motive in retirement as well – the precautionary motive, which is positive owing to uncertainty surrounding the time of death.
 - Households' unequal distribution of assets makes statistical analysis at a microlevel difficult, as wealthy households are often underrepresented in samples.¹¹
 - Many empirical studies go as far as identifying a positive saving rate among pensioners. This can be explained primarily by the fact that transfer income, which pensioners receive owing to their claims on a pension fund or on the public pension system, is classified as aggregate income instead of aggregate dissaving.
 - In addition, a significant statistical correlation between the aging of society and saving behavior does not indicate direct causality unless all control variables are included. The aging of society can have an indirect effect on saving behavior (e.g. lower net marginal capital productivity).¹²

⁸ Davis and Li (2003).

⁹ Dirschmid and Glatzer (2004).

¹⁰ Poterba (2004).

¹¹ Bosworth et al. (2004).

¹² McCarthy and Neuberger (2003).

This study is not based on the conceptual framework of overlapping generations, as this framework frequently limits price effects to the transition between consecutive generations and so does not do justice to the pricing mechanism in financial markets. Furthermore, the results are very sensitive to the assumptions and the structure of certain models.¹³ Instead, the real impact of demographic developments and the dissaving momentum of different generations are integrated into a growth theory framework. Since empirical studies on the correlation between age and saving behavior do not provide any clear results, reference is made to consumption by not economically active persons and not to their saving behavior. Furthermore, this conceptual framework integrates contrary effects arising from both the change in demographic structure (growing overall consumption by pensioners) and the decline in population (demand for real capital) on the long-term average real interest rate.

Demographic Developments and Real Interest Rates

The impact of demographic developments on the real interest rate can be conceptually represented by a neoclassical growth model.¹⁴ Since primarily the effects on real variables of a change in the rise of the number of economically active persons are to be tested, a supply-oriented conceptual framework is best suited to the problem. The model is guided by a large number of simplifying assumptions: In the long term, prices are assumed as having sufficient flexibility

to ensure an equilibrium in goods, finance and labor markets in each period. In addition, the analysis disregards many other possible influencing factors for real interest rates. Since this model operates with real parameters only, potential monetary factors do not play a role. In other words, above all, monetary policy, inflationary expectations and financial market volatility are excluded on heuristic grounds. Moreover, a closed economy is assumed. The analysis confines itself to the correlation between demographic developments and output potential, as well as to marginal capital productivity. It is also assumed that technological progress is exogenous and not factor-related, i.e. that it is solely a function of time and increases the productivity of the overall stock of the relevant factor and not only that of the flow in the latest period.

What Is the Correlation between Demographic Variables and the Real Interest Rate in the Neoclassical Growth Model?

The equilibrium growth path for exogenous, not factor-related Harrod-neutral technological progress is derived from an output function of a general form as follows:

$$Y(t) = F[A^K(t)K(t), A^L(t)L(t)] \quad (1)$$

This function is continuously differentiable and satisfies some additional conditions: output per unit of labor and marginal capital productivity stock per unit of labor are defined as y and k so that $y = f(k)$. In addition, marginal capital productivity per unit of labor is positive $f'(k) > 0$ but decreases as the capital stock per

¹³ McCarthy and Neuberger (2003).

¹⁴ The corresponding model can be found in any textbook on macroeconomics and growth theory. The representation selected here follows Mankiw (1997) and Frenkel and Hemmer (1999).

unit of labor increases ($f''(k) < 0$) and as $\lim_{k \rightarrow 0} f'(k) = \infty$, $\lim_{k \rightarrow \infty} f'(k) = 0$.

Output $Y(t)$ in period t is a function of (1) the level of technological knowledge $A^K(t)$ determining capital productivity, (2) capital stock $K(t)$, (3) the level of technological knowledge $A^L(t)$ determining labor productivity, and (4) labor supply $L(t)$ in the period. Only Harrod-neutral technological progress satisfies the conditions of equilibrium growth: technological progress leaves both the capital coefficient $k/f(k)$ and the functional income distribution between labor and capital unchanged. Harrod-neutral technological progress is defined as labor-boosting technological progress that leaves the capital productivity unchanged but increases the productivity of the stock of the factor labor. From this it follows that $\partial A^K(t)/\partial t = 0$. If $A^K(t)$ is normalized to 1, a starting point for the analysis is derived as follows:

$$Y(t) = F[K(t), A^L(t)L(t)] \quad (2)$$

$$\frac{Y(t)}{A^L(t)L(t)} = f\left[\frac{K(t)}{A^L(t)L(t)}\right] \quad (3)$$

Due to the linear homogeneity of the output function, $\hat{y} = Y(t)/A^L(t)L(t)$ – labor productivity per efficiency unit – can be given as a function $f[\bullet]$ of capital intensity per efficiency unit $\hat{k} = K(t)/A^L(t)L(t)$ and simplified to the labor productivity function per efficiency unit $\hat{y}(t) = f[\hat{k}(t)]$. Capital productivity per efficiency unit is defined as

$$\hat{y}(t)/\hat{k}(t) = [Y(t)/A^L(t)L(t)]/[K(t)/A^L(t)L(t)].$$

Let us analyze the long-term equilibrium growth rate, defined as constant capital stock over time per efficiency unit. If the capital intensity per efficiency unit is differentiated

by time, is remodeled and set to equal zero, this yields the relationship between total national saving and national investment in a state of equilibrium growth (equations 4 to 6). A constant saving rate $0 < s < 1$, a constant rise in the number of economically active persons with the rate $g_L = \partial L(t)/\partial t$ a constant national depreciation rate of δ , and Harrod-neutral technological progress of $g_A = \partial A^L(t)/\partial t$ are assumed:

$$\hat{k}(t) = \frac{K(t)}{A^L(t)L(t)} \quad (4)$$

$$\frac{\partial \hat{k}}{\partial t} = s f(\hat{k}) - (g_L + g_A + \delta)\hat{k} = 0 \quad (5)$$

$$s\hat{y} = (g_L + g_A + \delta)\hat{k} \quad (6)$$

Sufficient levels of total national saving are required to keep the capital stock per efficiency unit constant. In other words, depreciation needs to be financed from this as does additionally required capital stock for additional efficiency units, which consist of both additional labor owing to the rise in the number of economically active persons and technological progress (equation 6). Along the equilibrium growth path, national output per efficiency unit and capital stock per efficiency unit are constant over time. Output per unit of labor and per capita income Y/L increase with the labor productivity that is equal to the rate of technological progress g_A , $g_{Y/L} = g_A$. National income Y increases with both labor productivity and the rise in the number of economically active persons ($g_Y = g_A + g_L$).

How Can Structural Population Growth Be Integrated into the Model?

The standard model assumes that the population consists solely of economically active persons. This conceptual framework is not suitable for analyzing the economic effects of structural pop-

ulation growth. Consumption by not economically active persons also needs to be financed from national income, irrespective of the form of underlying claim thereon. This could be social security legislation and the Pension Fund Act, as well as a claim involving an economic interest. The national dependency ratio dep , the ratio of not economically active to economically active persons, is multiplied by real consumption rep per not economically active person relative to national income per economically active person. From this the share of consumption by not economically active persons as a percentage of national income per efficiency unit can be calculated. The constancy of the variable rep is assumed on heuristic grounds, so that the real consumption per not economically active person increases in proportion to national income per economically active person.¹⁵ National income per efficiency unit can therefore be broken down into the individual components of consumption per efficiency unit \hat{c} , consumption by not economically active persons $dep \times rep \times f(\hat{k})$ and saving per efficiency unit $[f(\hat{k}) - dep \times rep \times f(\hat{k})] \times s$. It is assumed on heuristic grounds that not economically active persons do not save. It follows from equation (6) that total saving has to be equal to the demand for real capital. Consequently, for consumption per efficiency unit accounting for structural population growth, equation 7 can be derived as:

$$\begin{aligned} & f(\hat{k}) - dep \times rep \times f(\hat{k}) - \\ & - [f(\hat{k}) - dep \times rep \times f(\hat{k})] \times s = \\ & = \hat{c} = (1 - dep \times rep) f(\hat{k}) - \\ & - (g_L + g_A + \delta) \hat{k} \end{aligned} \quad (7)$$

Is There A Saving Rate for which Long-Term Consumption per Efficiency Unit Is Maximized?

For any saving rate, there is a constant capital stock per efficiency unit and constant income per efficiency unit which satisfy equation (6). Consumption by not economically active persons is determined by social security legislation, political considerations, and holdings of financial and real assets. On this basis, the share of income of economically active persons can be calculated as a percentage of national income, a portion of which the latter save. Economically active persons are not indifferent to the level of the saving rate. They make their saving decision such that their long-term level of consumption is maximized. If the saving rate is too high, the capital stock is too large and their consumption is lower despite higher output, as more output needs to be invested in maintaining equilibrium capital stock. If the saving rate is too low, gross marginal capital productivity will exceed the level required to maintain the equilibrium capital stock and, by increasing the saving rate, additional capital can be saved until maximum consumption is attained.

¹⁵ The variable “rep” is determined primarily in accordance with social security legislation and social policy. Constancy assumes that cuts in the public pension system will basically be compensated by private provision. Only a small portion (consumption by beneficiaries from funded pension provision) depends on the real interest rate. Roughly 50% of not economically active persons will be pensioners in 2020. If around half of these receive from the second or third pillar a supplementary pension covering a quarter of their average consumption, this will be equivalent to only 6.25% of the consumption by not economically active persons.

In equations (8) and (9), therefore, consumption per efficiency unit \hat{c}^* is derived in accordance with \hat{k}^* , abstracting from a potentially positive time preference rate of households:

$$\frac{\partial \hat{c}^*}{\partial \hat{k}^*} = (1 - dep \times rep) \frac{\partial f(\hat{k}^*)}{\partial \hat{k}^*} - (g_L + g_A + \delta) = 0 \quad (8)$$

$$\frac{\partial f(\hat{k}^*)}{\partial \hat{k}^*} = \frac{g_L + g_A + \delta}{(1 - dep \times rep)} \quad (9)$$

Equation (9) shows that gross marginal capital productivity must be equal to the sum of the growth in the number of economically active persons g_L , technological progress g_A and depreciation δ , divided by the share of national income available for both consumption and saving by economically active persons in percent so that the latter do not have to spend more than is necessary to maintain the capital stock and can consume more.

What Impact Do Demographic Developments Have on Gross Marginal Capital Productivity?

The decline in growth in the number of economically active persons is included in the model by $g_{L1} < g_L$. Structural growth is integrated into the conceptual framework by the rise in consumption by not economically active persons owing to the dependency ratio dep increasing to dep_1 (including increased “dissaving” by pensioners).

As equations (10) and (11) show, the impact of demographic develop-

ments on the long-term average real interest rate is ambiguous:

$$\partial \frac{\left(\frac{\partial f(\hat{k}^*)}{\partial \hat{k}^*}\right)}{\partial g_L} = (1 - dep \times rep)^{-1} > 0 \quad (10)$$

$$\partial \frac{\left(\frac{\partial f(\hat{k}^*)}{\partial \hat{k}^*}\right)}{\partial dep} = (g_L + g_A + \delta)(dep) (1 - dep \times rep)^{-2} > 0 \quad (11)$$

The derivatives of gross marginal capital productivity with respect to both the rise in the number of economically active persons (equation 10) and the dependency ratio (equation 11) have the same positive sign. Since the former decreases and the latter increases, contrary effects on the long-term average real interest rate are generated. The heuristic assumption according to which not economically active persons do not save does not affect the result in principle.¹⁶ It should be borne in mind that the dependency ratio for the economy as a whole increases less steeply than is frequently presented in debate. The increase in the participation rate of 15- to 65-year-olds partly offsets the increase in the old-age dependency ratio.¹⁷ The increase in the participation rate has two effects on the share of not economically active persons as a percentage of the economically active, as it both increases the number of economically active persons and reduces the number of not economically active persons to the same extent. As a result, particularly the permanent effect of a higher participation rate counters

¹⁶ For equation (9), the inclusion of a positive saving rate of not economically active persons s_{dep} gives rise to only a minimal adjustment, which does not affect the results in equations (10) and (11):

$$\frac{\partial f(\hat{k}^*)}{\partial \hat{k}^*} = \frac{g_L + g_A + \delta}{[1 - dep \times rep(1 - s_{dep})]} \quad (9a)$$

¹⁷ Tichy (2005) underlines that the demographic development of the dependency ratio until 2050 is not unusual in historical terms, but that the low values of the 1990s were atypically low.

not economically active persons' growing consumption induced by aging. By contrast, the transitory increase in the participation rate (but not the level thereof) has an impact on economic growth. The former affects growth only insofar as it influences the rise in the number of economically active persons, i.e. only until a new constant participation rate has been reached.

In short, in the neoclassical growth model, the following can be said for the effects of a decline in the rise of the number of economically active persons: the optimal capital intensity per efficiency unit increases, and the factor labor is partially substituted by the factor capital. The net marginal product of capital – i.e. the long-term average real interest rate – can, on the one hand, decline due to a broadening of the capital base but, on the other hand, can increase owing to structural change in the population. Dissaving by not economically active persons increases long-term average real interest rates, as this reduces the total net saving available for investment purposes. Which of the two effects prevails is further analyzed below by means of a simulation based on Austrian data. Total output per efficiency unit and capital stock per efficiency unit are constant over time. Output per economically active person and per capita income Y/L rise in tandem with labor productivity $g_{Y/L} = g_A$. National income Y increases in parallel with both labor productivity and the rise in the number of economically active persons ($g_Y = g_A + g_{L1}$). Hence, it now grows at a slower rate than when the number of economically active persons rises more rapidly. If $g_A < |g_{L1}|$

(for $g_{L1} < 0$), national income could also decline.

Although the model is technically not very sophisticated, it does indicate the most important influencing factors of demographic developments on the long-term average real interest rate. The key points of criticism about the neoclassical growth model relate to two assumptions, in particular: the rate of technological progress is exogenous, and the economy it applies to is a closed economy.

Neoclassical growth theory places considerable importance on the *exogenous rate of technological progress*, as this determines per capita income growth. The more recent growth theory¹⁸ endogenizes the rate of technological progress. This is why quantitative analysis uses scenarios that assume future productivity growth fluctuating between 1.25% and 2.25% a year. In the model, it is assumed that the rate of technological progress is independent of demographic developments.

The model's most restrictive assumption is definitely that of a *closed economy*. As a result, the real interest rate may fall irrespective of demographic developments in the rest of the world. Since in many other OECD countries (e.g. Germany, Italy, Japan, Spain, the U.S.A., as well as the CEE countries) demographic developments are similar to Austria's, long-term average real interest rates are also expected to decline in these countries. In this way, the advantages of international diversification and integration are moderated. Idiosyncratic risks (country risks, currency risks and political risks) frequently associated with investments in the countries with the fastest population growth often render these coun-

¹⁸ *Inter alia* Romer (1986, 1990).

tries rather unattractive for long-term pension provision in Austria.¹⁹ However, even if pension provision were fully diversified internationally, this would not be enough to avert the impact of demographic developments on the real interest rate in Austria. If annuities that have benefited from internationally diversified assets are issued in Austria, they will increase the aggregate price level and, consequently, lower real consumption by economically active persons, which will lead to a rise in real interest rates in the model. As Börsch-Supan et al. (2003) therefore explain, both investment and consumption should be internationally diversified, i.e. especially in the form of capital exports and goods imports. If, however, the hypothesis of fully integrated global financial and real capital markets is assumed, a globally uniform net marginal capital productivity would result. It would be independent of demographic developments in Austria. If Austria's net marginal capital productivity cannot fall below the standard international level, the capital deepening required will not therefore take place. The result is a suboptimal capital stock and a suboptimal level of Austrian national income. The relatively low degree of financial and real capital market integration is known in economics as the Feldstein-Horioka puzzle. In addition, the extent of investment portfolios' international diversification is surprisingly low.²⁰

Real Interest Rates and Funded Pension Provision

The funding principle facilitates intertemporal income transfer between years of economic activity and those of retirement by the acquisition of as-

sets (especially securities). Assets are acquired from current savings over the period of economic activity. At the end of this period, annuities are acquired using the accumulated wealth. What is the relationship between future annuities and net marginal capital productivity?

With real constant annual individual net savings S and an expected long-term average real interest rate r (after tax and additional asset management costs), after t_A years pension capital PC can be derived from equation (12):

$$PC = \frac{(1+r)^{t_A} - 1}{r} S$$

$$\forall r, t_A: r \neq 0, t_A \in N_+ \quad (12)$$

With given real constant annual individual net savings S , the pension capital PC attained after t_A years decreases if the expected long-term average real interest rate r (after tax and additional asset management costs) is reduced:

$$\frac{\partial PC}{\partial r} = \frac{(1+r)^{t_A} - 1 - r t_A (1+r)^{t_A-1}}{r^2} S < 0$$

$$\forall r, t_A: r > 0; t_A > 1, t_A \in N_+ \quad (13)$$

$$\Leftrightarrow \frac{(1+r)^{t_A} - 1}{t_A} < r(1+r)^{t_A-1} \quad (14)$$

Inequality (14) is valid, as the annual average net return is smaller than the last period's interest income discounted over a single period. This results from the compound interest effect, whereby the capital stock is far higher at the start of the last period compared with the first period. If the expected long-term average real interest rate r (after tax and additional asset management costs) is reduced, the required real constant net savings

¹⁹ Bosworth et al. (2004).

²⁰ Obstfeld and Rogoff (2001).

s has to increase in order to attain the given target pension capital PC after t_A years. $\partial S/\partial r > 0$ is also valid under the same conditions; constant real net savings have to be higher for a lower expected long-term average real interest rate so that the same target pension capital is attained at the end of the saving period.

For an expected long-term average real interest rate r (after tax and additional asset management costs), pension capital PC , which is required to receive a constant real annual annuity A over t_R years, can be obtained from equation (15):²¹

$$PC = \frac{(1+r)^{t_R} - 1}{(1+r)^{t_R} r} A$$

$$\forall r, t_R: r > 0; t_R \in N_+ \quad (15)$$

If, before entering retirement, one has saved a capital stock of PC at the end of the saving period and the expected real interest rate r (after tax and additional asset management costs) falls owing to demographic developments, this will affect the constant real annuity A :

$$A = \frac{(1+r)^{t_R}}{(1+r)^{t_R} - 1} PC$$

$$\forall r, t_R: r > 0; t_R \in N_+ \quad (16)$$

$$\frac{\partial A}{\partial r} = \frac{(1+r)^{t_R} [-1 - r t_R (1+r)^{-1} + (1+r)^{t_R}]}{[(1+r)^{t_R} - 1]^2} PC > 0$$

$$\forall r, t_R: r > 0; t_R \in N_+ \quad (17)$$

$$\Leftrightarrow \frac{(1+r)^{t_R} - 1}{t_R} > \frac{r}{(1+r)} \quad (18)$$

Inequality (18) is valid, as the annual average net return is greater than the discounted real interest rate of a single period due to the compound interest effect. If the long-term average real interest rate r (after tax and additional asset management costs) falls owing to demographic developments, the annual annuity A will also fall for a given pension capital PC . A decline in the long-term average real interest rate has a twofold effect on funded pension provision, decreasing both the pension capital saved and the resulting annuity.

Demographic Developments, Real Interest Rates and Funded Pension Provision: Quantitative Results

A simulation for 2020 based on equations (9), (12) and (16), using demographic data provided by Statistics Austria (2003) and the Austrian Committee for Long-Term Pension Sustainability (2002), shows the following key results:²²

In the model, however, demographic developments trigger a decrease in long-term average real interest rates in Austria. This decrease is a long-term phenomenon. The simulation results in the model are therefore not fundamentally dependent on the choice of year (2020).

– In the scenario to which the highest probability of event is allocated, future productivity growth will fall to 1.75% a year and the participation rate will rise to

²¹ The costs of both capital accumulation and annuities are abstracted from in this analysis. Although they reduce the level of the annuity for a given amount of savings, they do not directly affect the relationship between changes in the real interest rate and pension capital, and changes in the real interest rate and the annuity.

²² The quantitative results of the impact of demographic developments on long-term average real interest rates and funded pension provision which are derived from the model are used to represent two things: first, the magnitude of the contrary effects arising from capital deepening and growing consumption by not economically active persons on long-term average real interest rates and, second, the demographic risk of funded pension provision. These results are not a forecast of future trends in Austrian real interest rates.

75%. Despite international diversification in the investment of funded pension provision and in consumption by pensioners as well as partial integration of financial and real capital markets, demographic developments will have a negative impact on funded pension provision: the long-term average real interest rate will fall by around 0.3 percentage point, the pension capital at the end of the saving period will be some 2.6% lower compared with the initial scenario with a positive rise in the number of economically active persons and the annual pension will be down by approximately 6%. Funded pension provision is very sensitive to interest rates.

- International diversification and integration reduce the demographic risk of funded pension provision. However, its dependency on international long-term average real interest rates increases correspondingly.
- Sensitivity analyses show that the impact of demographic developments on funded pension provision is reduced by a rise in productivity growth and strengthened by an increase in the participation rate.
- Since in many other OECD countries (e.g. Germany, Italy, Japan, Spain, the U.S.A. and the CEE countries), demographic developments are similar to Austria's, a decline in the long-term average real interest rate is also anticipated in these countries, thus moderating the merits of international diversification and integration.²³ This is supported by a study on the impact of demographic developments on the European real inter-

est rate by Miles (2002), in which the European real interest rate of 3.95% (2000) falls to 3.66% in 2020 and to around 3.50% in 2050. If the degree of international diversification and integration is significant, the dependency of funded pension provision on international real interest rate trends is very high. In the simulation, a decline in the international real interest rate by 0.5 percentage point increases losses to around 10% of the annual pension, compared with the initial scenario.

Impact of Demographic Developments on Financial Stability

The impact of the decline in long-term average real interest rates in Austria on funded pension provision and financial stability depends primarily on the diversification of risk in funded pension provision, which depends, in turn, on certain products' institutional characteristics. The following analysis therefore confines itself to pension funds, severance funds and the subsidized personal pension schemes. As a rule, other saving products cannot be clearly classified under pension provision (e.g. building loan contracts, passbooks, life insurance policies including residual debt insurance, death insurance). The implications for the general interest rate exposure of financial intermediaries cannot be included in this analysis. The extent to which demographic developments increase the risk for financial intermediaries within the framework of funded pension provision (in particular, pension funds, severance funds, banks and insurance companies), from which potential risks for

²³ Poterba (2004).

the financial system could arise, is analyzed.

As far as *pension funds* are concerned, two types of contracts should be distinguished: defined benefit and defined contribution contracts. For the former, the employer bears the investment risk. For the latter, the beneficiaries (including prospective beneficiaries) bear the risk. Defined contribution contracts make up a large portion of Austrian pension fund contracts. In both cases, the risk is limited due to the fact that pension funds are legally obliged to guarantee a specified minimum income. The amendment of the Austrian Pension Fund Act in 2003²⁴ substantially reduced the amount of the minimum return guarantee in view of pension funds' insufficient capital backing, stipulating that the actual payout (but not the value of the asset), which would be equivalent to the minimum return, is guaranteed. In addition, the calculation period of 60 months was extended until the minimum return is attained, or until the prospective beneficiary becomes the beneficiary, i.e. eligible to receive the pension benefits. The minimum return is relatively low and is defined as half of the average secondary market return for Austrian government bonds minus 0.75 percentage point, with the average being accumulated over 60 months (Article 2 paragraph 2 Austrian Pension Fund Act). The minimum return is therefore influenced by the level of domestic long-term average real interest rates. This is why the impact of demographic developments also reduces the minimum return. Hence, demographic developments do not directly increase

the likelihood that the relevant guarantee becomes applicable. For pension funds, therefore, lower long-term average real interest rates do not generate any additional risks. The amendment of the Austrian Pension Fund Act in 2005 will also provide for the possibility of contracting out the minimum return guarantee, which has in the past proved to be unreliable in the long term.²⁵ For defined benefit contracts, demographic risks are borne by employers in the form of additional contributions and, for defined contribution contracts (most pension fund contracts), by the beneficiaries themselves in the form of lower pensions. Since pension funds have promised unrealistically high levels of calculated interest rates in the past, it is likely therefore that pensions with lower long-term average real interest rates will fall short of expectations on conclusion of the contract.

In the case of *severance funds*, the investment risk is largely borne by beneficiaries. Under Article 24 paragraph 1, the Austrian act governing employee retirement and severance pay provision provides for a guarantee of the sum of severance pay contributions in stipulated circumstances.²⁶ Although demographic developments trigger a decline in average real interest rates, this does not mean negative values. This is why there is no fundamental future risk that the guarantee would become applicable due to demographic developments. As a rule, the guarantee is valued by means of stochastic methods that use historical price data. As these methods do not take future trends into account, the valuation may suffer

²⁴ Austrian Federal Law Gazette Part I 71/2003.

²⁵ 790 of the Enclosures XXII. Legislative Period, Committee Report, Article 2 Amendment of the Austrian Pension Fund Act.

²⁶ Austrian Federal Law Gazette Part I 100/2002.

slight distortions if the long-term average real interest rate is lower. The guarantee could be valued at too low a level. Furthermore, severance funds can also guarantee a fixed interest rate. However, this can be amended in the (fiscal) years to follow, i.e. they can be adjusted to new market conditions. An appropriate response can therefore be made to a decline in long-term average real interest rates so as to prevent additional risks for severance funds arising within the framework of an optional interest rate guarantee.

Investors themselves bear the risk of *subsidized personal pension schemes*. However, a guarantee of the capital invested is stipulated by law for this product under Article 108h paragraph 1 line 3 of the Austrian Income Tax Act.²⁷ This guarantee relates to the nominal value of the sum of the contributions paid minus the government premia credited. Although demographic developments trigger a decline in average real interest rates, this does not mean negative values. This is why there is no fundamental future risk that the guarantee would become applicable due to demographic developments. As a rule, the pricing of this guarantee is based on stochastic simulations that are, in turn, based on historical price developments in the financial markets. Not taking account of the impact of demographic developments on future long-term average real interest rates could therefore give rise to a systematic distortion in the price for this guarantee. Since international diversification is of the utmost importance for mitigating the impact of demographic developments on funded pension provision, investment

restriction under Article 108h paragraph 1 line 1 of the 1988 Austrian Income Tax Act²⁸ should be subjected to critical review.

In short, it can be said that the risks arising from demographic developments and lower long-term average real interest rates have to be borne by beneficiaries, in particular, in the form of lower pensions. No significant additional risks arise for the stability of financial intermediaries and hence for the financial system.

Summary

The “asset meltdown” hypothesis is considered from a highly critical perspective in empirical literature. This study does not use the conceptual framework of overlapping generations, as the price effect is restricted to the transition between consecutive generations and so does not do justice to financial markets’ pricing mechanism. Instead, real effects arising from demographic developments and the wealth dynamics of different generations are integrated into a growth theory framework.

In short, the following can be said about the impact of a decline in the growth in the number of economically active persons in the model: optimal capital intensity per efficiency unit increases, and the factor labor is partially substituted by the factor capital. Long-term average real interest rates can either fall by an increase in capital intensity or rise owing to structural change in the population (dissaving by pensioners). An analysis of the impact of demographic developments on financial market prices and real interest rates therefore needs to include the impact of demographic develop-

²⁷ Austrian Federal Law Gazette Part I 155/2002.

²⁸ Austrian Federal Law Gazette Part I 10/2003.

ments on both households' net supply of savings and the demand for capital by the corporate sector. Among the underlying data for Austria, the initial effect prevails and the long-term average real interest rate falls. Within the framework of funded pension provision, a decline in the long-term average real interest rate reduces both the pension capital saved and the resulting pension. The key factors of influence on the long-term average real interest rate are (1) the rise in the number of economically active persons, (2) the ratio of the consumption of not economically active persons (including dissaving by pensioners) to national income, (3) the international average real interest rate and (4) productivity growth.

In the scenario to which the highest probability of event is allocated, future productivity growth will shrink to 1.75% a year and the participation rate will climb to 75%. Despite international diversification in the investment of funded pension provision, consumption by pensioners and the

partial integration of financial and real capital markets, demographic developments will have a negative impact on funded pension provision: compared to the initial scenario with a positive rise in the number of economically active persons, pension capital at the end of the saving period will fall by about 2.6% and the annual annuity will follow suit, declining by some 6%. Dependency on international real interest rate trends will be very high. If the international real interest rate falls by 0.5 percentage point, pension losses will increase to some 10% relative to the initial scenario.

The impact of demographic developments on financial stability will depend primarily on the diversification of risk. Beneficiaries, above all, will have to bear the risk of lower long-term average real interest rates in the form of lower pensions. No significant additional risks will arise within the framework of funded pension provision for the stability of financial intermediaries and hence for the financial system.

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The Croatian Banking System

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This paper provides an analysis of the stability of the Croatian banking sector. After the banking crisis of 1998, the Croatian banking system underwent a deep transformation process; foreign investors gained a dominating market share of more than 90% of total assets, with Austrian banks holding 43% thereof. Compared to other Central and Eastern European countries (CEECs), the degree of banking intermediation is relatively high in Croatia. In recent years, lending to the private sector and in particular to households has risen whereas lending to the general government has declined. Foreign currencies continue to play an important role in the Croatian banking sector, in particular on the liabilities side of banks' balance sheets. While maintaining a large negative net foreign currency position on their balance sheets (with an increasing portion of net liabilities to nonresidents), Croatian banks' overall net foreign currency position seems to be marginally positive. Still, foreign currency(-indexed) lending represents a credit risk as it entails an indirect exchange rate risk. Asset quality, by contrast, has improved significantly over the past five years, the capital adequacy ratio is on a relatively high – albeit declining – level, and real return on equity (ROE) is now as high as the profitability levels observed in other CEECs.

1 Introduction

This study gives a comprehensive overview of the Croatian banking sector with a special focus on banking sector stability. For this purpose, the authors analyze the current structure of, and recent developments in, the banking sector with a view to the risks involved (e.g. direct and indirect exchange rate risk, credit risk and liquidity risk) as well as to the sustainability of these developments. Moreover, the paper analyzes banking sector profitability. After a brief review of the turbulent history of the Croatian banking sector, this study also presents the sector's current main features (ownership structure, market concentration, interest rate spread). The in-depth analysis of the structure of assets and liabilities is followed by an investigation of the role of foreign exchange in the Croatian banking sector. After that, the authors explore the development of asset quality, capital adequacy and profitability. A special section devoted to the role of Austrian banks in Croatia concludes this study.

2 A Brief History of the Croatian Banking System

Unlike in other CEECs, a two-tier banking system was already established in Croatia at the beginning of the transition process from socialism to capitalism, but the banking system had to be revamped and market-based banking practices had to be introduced.

In 1990, 26 banks were operating in the country. In accordance with the Yugoslav variant of socialism, state-owned enterprises owned the banks, and when these enterprises were privatized, banks were transferred into private ownership as a side effect. As a result, banks majority-owned by private investors held almost 60% of total banking sector assets as early as in 1997 even though there had been no bank privatizations in the narrower sense.

Owing to very liberal bank licensing regulations with low minimum equity capital requirements and given the relatively liberal supervision framework, the number of banks grew substantially during the 1990s and reached 60 by 1997. However,

Refereed by
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¹ The authors would like to thank Peter Breyer for his valuable comments on this paper. This study represents a follow-up on a paper prepared by Stephan Barisitz (OeNB) in 2000. It constitutes the final part of a series of studies on the banking sectors of the EU candidate countries (see also the analyses of the Bulgarian and Romanian financial sectors presented in the previous two issues of the OeNB's Financial Stability Report).

the overall level of concentration in the Croatian banking sector was high: in 1995, the four largest banks had a market share in total assets of almost 70%. The Herfindahl-Hirschman index² (1995: 1597) also suggested a rather concentrated marketplace.

During the 1990s, the banking system was confronted with several inherited problems that had to be solved, among them the issue of households' foreign currency savings which had been redeposited with the National Bank of Yugoslavia. When the latter seized all foreign exchange reserves after the dissolution of Yugoslavia, the Croatian government assumed responsibility for these bank claims. Since its foreign exchange reserves were not sufficient, the government issued German mark-indexed bonds to the banks in late 1991 to prop up their assets as a countervalue of the foreign exchange deposits. At the same time, households' foreign exchange deposits were frozen by the government for a period of three years in order to ease the liquidity pressure on banks, to be gradually unfrozen at a minimum rate of 20 semiannual instalments. By end-2004, these deposits had been paid back almost completely.

Debt owed by insolvent large state-owned enterprises represented another inherited problem. To remedy the situation, the government issued so called "big bonds" in 1991–92, which enterprises used to repay the nominal value of their overdue obligations to banks. These bonds had a maturity of 20 years and were indexed to the producer price index (PPI), but

paid no interest and were not tradable; thus, they did not provide banks with fresh liquidity.

Both solutions helped ease banks' solvency strains (at the combined cost of around 23% of annual GDP), but they failed to address several key issues, among them the counterproductive cross-ownership structures which had been institutionalized by the early indirect bank "privatizations," the weak capital base of many newly established banks or the fact that many banks were set up by non-financial corporations for the sole purpose of collecting cheap deposits. Bad management, inaccurate credit risk monitoring and cost inefficiency also ranked high in the list of deficiencies.

Given the problems of the country's four largest banks, interbank interest rates were persistently high during the first half of the 1990s; combined with the assumption that these four banks would be prevented from going bankrupt, the high interest rates rendered interbank lending a prosperous business. However, interbank rates came down sharply soon after liquidity was injected into three of the four banks and their assets and liabilities were cleaned in 1995–96 in the course of a bank rehabilitation program (at combined costs of around 6% of annual GDP).

The decline of interbank rates combined with strong economic growth, a stable exchange rate, a low inflation rate and strong capital inflows resulting from the repatriation of foreign currency assets forced banks to expand their business with nonbank cus-

² The Herfindahl-Hirschman index is calculated as the sum of the squared market shares (in percentage points) of individual banks. It can take values between near zero and 10,000, with values below 1,000 suggesting nonconcentration, values between 1,000 and 1,800 indicating moderate concentration and values above 1,800 suggesting a highly concentrated market.

tomers. During the ensuing credit boom, banks' risk management was often weak, their credit processes were poorly controlled – related-party lending and single-client exposure were common practices – loan loss provisioning was inadequate and the competition for deposits was often irresponsible. Bank failures began to occur when loans were not repaid in time as the economic growth slowed down because of tightened fiscal and monetary policies, which were implemented in 1998 in response to a sharp

deterioration in the external balances. The difficulties were exacerbated by adverse external factors (e.g. the Asian financial crisis in 1997, the Russian crisis in 1998 and the Kosovo war) and peaked in a banking crisis in 1998–99, which affected 16 banks; 12 of these banks exited the market, 2 were merged with other banks and only 2 were rehabilitated. As a result of this consolidation process and several bank mergers, the number of banks declined from 60 by end-1998 to 43 by end-2000.

Table 1

Banking Institutions in Croatia								
	1997	1998	1999	2000	2001	2002	2003	end-Sept. 2004
Number of banks	60	60	53	43	43	46	41	39
Share of private banks in total assets in %	58.1	56.9	54.4	94.3	95.0	96.0	96.6	96.6
Share of foreign banks in total assets in %	4.0	6.7	39.9	84.1	89.3	90.2	91.0	91.0
Number of employees	18,084	17,318	16,858	16,193	16,051	17,126	17,086	..

Source: Hrvatska Narodna Banka.

One major outcome of the crisis was the government's decision to sell the remaining state-owned banks to foreign strategic investors who had been deterred from entering the Croatian market by the military conflicts in the region in the early 1990s; the first foreign bank entered Croatia in 1994, i.e. before the Dayton Accord in 1995, and several others followed suit after the peace agreement. In 1998, there were still no more than ten foreign-owned banks operating in Croatia with a share of 6.7% in total banking sector assets. The situation tipped in late 1999 and early 2000 when the government stepped up its privatization efforts, selling the country's second-, third- and fourth-largest banks (as measured by total assets) to foreign strategic investors and placing the majority of shares in the largest bank with foreign investors through the London Stock Exchange. This step and the sale of smaller banks

to foreign investors as well as the establishment of new banks by foreigners led to an increase in the number of foreign-owned banks to 24; by 2001, they accounted for 89.3% of total bank assets. By September 2004, their number was reduced to 17 as a result of several mergers, but their share in total banking sector assets had increased to 91%.

3 Structure of the Croatian Banking System

By end-September 2004, 39 banks operated in Croatia, with privately-owned banks accounting for approximately 97% of total banking sector assets and the share of banks majority-owned by foreign investors amounting to 91% (one of the highest shares in the region). Italian and Austrian banks are among the largest foreign investors in the Croatian banking industry.

Banking sector concentration was reduced between 1995 and 1997; however, the four largest banks (Zagrebacka Banka, Privredna Banka, Erste & Steiermärkische Bank and Raiffeisenbank Austria) managed to strengthen their position again after the banking crisis of 1998–99. They accounted for 64.3% of total assets by end-September 2004, up from 53.1% by end-1997. As a result of this high concentration, the soundness of the largest systemic banks has an enormous impact on the overall stability of

the banking system. However, risks are mitigated by foreign strategic ownership.

The Herfindahl-Hirschman index of banking sector assets shows a decrease in concentration until 1997, thus substantiating the concentration ratios measured on the basis of the four largest banks' asset shares. The index figure increased between 1998 and 2000 as a result of the bank mergers, before falling back to 1,237 in 2002 and rising again to 1,358 by end-September 2004.

Table 2

Concentration and Competition

	1997	1998	1999	2000	2001	2002	2003	end-Sept. 2004
Market share of the two largest banks in total assets in %	40.3	40.5	43.6	48.1	46.3	44.1	42.7	44.1
Market share of the four largest banks in total assets in %	53.1	53.3	58.1	62.0	60.0	58.6	61.6	64.3
Herfindahl-Hirschman Index	1,016	1,018	1,190	1,368	1,315	1,237	1,270	1,358
Interest rate spread (rate on loans less rate on total deposits)	9.7	12.0	9.3	7.1	6.8	9.4	9.8	9.6

Source: Hrvatska Narodna Banka, OeNB calculations.

The development of the interest rate margin (i.e. the difference between the interest rates on loans to enterprises and households and those on their deposits) also serves as an indicator of the development of competition. Before the banking crisis of 1998–99, this margin was at a double digit level (except in 1997). It declined until the end of 2001 following a decrease in the interest rate level. Changes in the computation method as from January 2002 led to a jump in the credit rate and consequently also in the interest rate margin. The 2003 rise in the interest rate margin probably reflects the tightening of

monetary policy of early 2003, which prompted banks to raise credit rates while maintaining low deposit rates.

4 Structure of Banks' Assets and Liabilities

By end-2004, the level of financial intermediation (as measured by total banking sector³ assets in percent of GDP) stood at 110.8%, which is significantly higher than in the eight new EU Member States in CEE (75% on average). Following a sharp contraction caused by the asymmetric impact of hyperinflation on banks' assets and on GDP from 121% of GDP in 1993 to 62.5% of GDP in

³ In this paper, the banking sector is defined as "other monetary financial institutions" (i.e. excluding the central bank). Total banking sector assets also comprise claims of the banking sector (i.e. excluding the central bank) on domestic monetary financial institutions including the central bank, whereas total banking sector liabilities comprise, inter alia, liabilities of the banking sector (i.e. excluding the central bank) to domestic monetary financial institutions including the central bank.

1994, the level of financial intermediation stagnated at 60–70% of GDP between 1994 and 1999. After the banking crisis and the privatization of the largest banks, the level of financial intermediation gradually went up again.

By end-2004,⁴ domestic claims⁵ (i.e. loans, securities and repurchase agreements) on the general government, nonmonetary financial institu-

tions, the corporate sector and households accounted for approximately two thirds of total assets, or almost 73% of GDP, with claims on households and nonfinancial corporations being the largest items. Claims on households increased rapidly over the past few years, overtaking claims on nonfinancial corporations, which declined slowly but steadily.

Table 3

Structure of Claims on Domestic Sectors

in HRK million

	1997	1998	1999	2000	2001	2002	2003	2004
Domestic claims on general government	15,548	15,518	17,170	20,230	21,340	23,340	23,107	22,839
of which bonds for blocked foreign exchange deposits	6,714	5,802	5,420	4,484	3,420	2,473	1,532	532
Domestic claims on nonmonetary financial institutions	247	194	154	162	281	915	762	894
Domestic claims on nonfinancial companies	35,487	41,225	35,244	35,891	42,882	51,723	53,810	58,643
Domestic claims on households	12,796	17,717	19,250	23,298	30,122	43,073	55,001	65,277
Domestic claims, total	64,078	74,655	71,818	79,581	94,625	119,051	132,680	147,653
Domestic claims in % of GDP	51.8	54.3	50.7	52.2	57.1	66.4	68.7	72.5

Source: Hrvatska Narodna Banka, OeNB calculations.

The share of claims on the general government declined from end-2000 onward, which reflects the government's fiscal consolidation efforts as well as the fact that the budget deficit continued to be predominantly financed by nonresidents. The development of government bonds for blocked foreign exchange deposits plays a significant role in this context: During the past decade, the volume of these bonds dropped gradually from 38% of GDP in 1993 to 0.3% of GDP in 2004, whereas the share of claims on the general government excluding these bonds fell less dramatically. The increasing ratio of

domestic claims to GDP (from 51.8% by end-1997 to 72.5% by end-2004) and the shift toward lending to the nongovernment sectors over the past few years can be taken as an indicator of increasing financial intermediation to the private sector.

Domestic claims are dominated by loans (87%). With a share of 9.8% of total domestic claims by end-2004, holdings of debt securities have so far played a limited role in the Croatian banking sector. Their weight had been much higher (almost 50%) during the early 1990s given the huge volume of bonds for blocked foreign currency deposits (37% of domestic

⁴ Data expressed as a percentage of GDP for 2004 is related to the sum of quarterly GDP between Q4 2003 and Q3 2004.

⁵ In this paper, the terms "credit(s)" and "loan(s)" are used synonymously, as opposed to "claims," which comprise credits and/or loans, securities and repurchase agreements.

claims and 31% of bank assets in 1993). However, the significance of debt securities excluding these special-purpose bonds has also diminished in recent years, thus reflecting,

above all, the decline in holdings of central government debt since 2001. Holdings of shares currently play a negligible role for Croatian banks.

Table 4

Structure of Bank Assets

HRK million

	1997	1998	1999	2000	2001	2002	2003	2004
Domestic claims	64,078	74,655	71,818	79,581	94,625	119,051	132,680	147,653
Claims on MFIs (incl. the central bank)	5,046	5,908	9,033	10,658	15,173	20,593	27,215	34,342
Foreign assets	16,186	12,763	12,400	19,710	32,808	25,978	35,383	43,551
Total assets	85,309	93,326	93,251	109,949	142,606	165,622	195,278	225,546
Total assets in % of GDP	68.9	67.8	65.9	72.1	86.1	92.3	101.1	110.8

Source: Hrvatska Narodna Banka, OeNB calculations.

Claims on monetary financial institutions increased from 5.9% of total assets by end-1997 to 15.2% of total assets by end-2004. This rise from 1997 onward was almost exclusively attributable to higher claims on the central bank (i.e. mandatory reserves, cash in vault and holdings of central bank securities) and may be explained by changes in the mandatory reserve requirements.

During the past decade, the share of banks' foreign assets in percent of total assets and GDP fluctuated within a relatively wide range; by end-2004 it amounted to 19.3% of total assets. Since the exchange rate of the Cro-

atian kuna against the euro has been relatively stable, these fluctuations cannot be explained by exchange rate developments alone, even though foreign assets are almost exclusively held in foreign currencies.

On the liabilities side, domestic sectors' deposits accounted for almost 60% of total liabilities by end-2004. This share has declined significantly in recent years concurrent to the increasing weight of foreign liabilities. Households were the major depositors with Croatian banks (66% of total deposits), followed by nonfinancial corporations (25%).

Table 5

Structure of Deposits

in HRK million

	1997	1998	1999	2000	2001	2002	2003	2004
Deposits by general government	7,573	8,017	6,456	7,697	7,016	8,525	7,874	9,414
Deposits by nonmonetary financial institutions	1,111	1,312	1,489	1,894	3,033	3,280	3,021	2,531
Deposits by nonfinancial companies	10,904	10,035	9,490	15,262	20,191	26,548	31,003	33,566
Deposits by households	32,779	39,579	38,600	47,776	72,532	73,794	80,852	88,630
Deposits, total	52,368	58,944	56,034	72,629	102,772	112,146	122,750	134,140

Source: Hrvatska Narodna Banka, OeNB calculations.

In the years under review except 2001, banks maintained a positive total net position (claims less deposits⁶) against domestic sectors (excluding monetary financial institutions). In 2001, this balance turned temporarily negative, as households deposited huge amounts of foreign exchange holdings with Croatian banks before the cash changeover in the euro area

at the beginning of 2002. The net position against households has traditionally been negative (albeit to a decreasing extent in recent years), and non-monetary financial institutions have also been net depositors. Thus, the overall net lender position emanates from Croatian banks' lending to non-financial corporations and the general government.

Table 6

Structure of Liabilities

HRK million	1997	1998	1999	2000	2001	2002	2003	2004
Deposits, total	52,368	58,944	56,034	72,629	102,772	112,146	122,750	134,140
Foreign liabilities	13,807	16,177	17,209	17,810	21,858	35,023	49,932	61,164
Debt securities issued	134	154	437	478	318	216	598	1,163
Restricted deposits	1,199	701	691	854	831	1,361	1,541	2,015
Blocked foreign exchange deposits	4,653	3,495	2,743	1,695	770	319	168	40
Liabilities to MFIs (incl. the central bank)	-159	867	1,188	369	110	188	1,224	904
Capital and reserves	17,027	19,786	21,975	24,953	25,455	26,323	27,390	28,666
Other liabilities (net)	-3,720	-6,797	-7,026	-8,839	-9,508	-9,956	-8,324	-2,546
Total liabilities	85,309	93,326	93,251	109,949	142,606	165,622	195,278	225,546

Source: Hrvatska Narodna Banka, OeNB calculations.

Similar to the volatility of banks' foreign assets, their foreign liabilities as a percentage of total liabilities have also fluctuated within a relatively wide range over the past decade. The share had been relatively stable between 1996 and 2001 before rising by around 10 percentage points to 27.1% of total liabilities by end-2004. This led to a significant deterioration in banks' net foreign asset position from 7.7% of total assets by end-2001 to -7.8% of total assets by end-2004. Since this deterioration coincided with the strengthening of banks' net lending position with domestic non-banks (which resulted mainly from the improvement of their net position toward households), a foreign-financed domestic lending boom (in

particular to households) seems to be responsible for this development. If this trend were to continue, it would be hardly sustainable and it would probably undermine the financial stability of the Croatian banking sector.

5 The Role of Foreign Exchange

Despite increased confidence in the Croatian banking system after the consolidation efforts of the late 1990s, probably supported by the long-term exchange rate stability, foreign currencies have continued to play an important role.

Foreign currency assets (including DEM-linked bonds for blocked foreign currency deposits) accounted

⁶ The net position is defined as claims less standard deposits, which means that repurchase agreements, debt securities issued, credits received, blocked foreign exchange deposits, restricted deposits and equity are not taken into account on the liability side.

for 67.9% of total assets by end-1993. This gradual decline to 32.6% over the following six years was not only caused by the outstanding volume of special purpose DEM-linked bonds, but also by that of other foreign currency assets. In 2000 and 2001, the share of foreign currency assets in total assets increased temporarily to approximately 36.5% (mainly as a result of the additional volumes of households' foreign currency deposits being redeposited abroad ahead of the euro cash changeover), and dropped again to 31.5% by end-2004.

At the end of 2004, the share of foreign currencies in total lending to domestic sectors stood at 11.4%, down from 62% in 1993. There are differences between sectors, however: The share of foreign currency-denominated loans in total lending was highest for the general government (almost 40%) and for nonmonetary financial institutions (31.4%), even though these two sectors accounted for only one quarter of total foreign currency loans. The share was lower for nonfinancial corporations (19.7%) and households (0.5%). However, the significance of foreign currency loans is actually higher than the above figures suggest: In fact, according to Hrvatska Narodna Banka (2005), slightly more than 70% of kuna-denominated loans are indexed to foreign currencies, so that the total share of foreign currency loans plus foreign currency-indexed kuna loans amounts to around 75% of total lending.

Foreign currencies play a more significant role on the liabilities side of banks' balance sheets: including blocked foreign currency deposits and restricted deposits in foreign currency, they accounted for 67.4% of total liabilities by end-1993. This share went down slightly to 61.3%

by end-2004. However, this decline was driven by a decrease in the outstanding amount of blocked foreign currency deposits and restricted deposits in foreign currency, whereas the share of other foreign currency liabilities increased continuously from 37.4% in 1993 to 61% in 2004. This movement clearly suggests that most of the deblocked foreign exchange deposits were transformed into regular foreign exchange deposits and that additional regular foreign exchange deposits were placed with banks. Moreover, foreign liabilities accounted for 39.4% of total foreign currency liabilities by end-2004, up from 22.3% by end-2001.

As with loans, the weight of foreign currencies in total deposits (61.8% by end-2004) varied significantly across sectors. It was highest for households (77.1%), followed by nonfinancial corporations (38.1%) and nonmonetary financial institutions (21.9%), whereas the general government holds only approximately 13% of its deposits in foreign currencies. Unlike loans, kuna deposits indexed to foreign currencies play an insignificant role, as their share in total deposits is less than 2%.

Since 1994, Croatian banks have maintained a negative net foreign currency asset position, which amounted to 7.6% of total assets (including bonds for blocked foreign currency deposits, blocked foreign currency deposits and restricted deposits in foreign currency) by end-1994 and peaked at 35.9% of total assets in 2002 before falling back to 29.8% by end-2004.

The structure of this position also changed significantly. At the end of 1994, banks' net foreign currency liabilities resulted exclusively from net foreign currency liabilities against

nonresidents. From then on, the share of net foreign currency liabilities against residents in total liabilities began to increase significantly as a result of the continuous redemption of DEM-linked bonds (which had been issued for blocked foreign currency deposits) and of the progressive conversion of blocked foreign currency deposits into regular ones. However, in recent years the share of net foreign currency liabilities against residents in total liabilities has decreased, since total domestic deposit growth remained below the growth level of total liabilities as foreign liabilities jumped. Simultaneously, in recent years the net foreign currency position against nonresidents tipped from positive to again negative values.

A breakdown of net foreign currency liabilities against residents (24.9% of total liabilities by end-2004) shows that net foreign currency liabilities against households amounted to 30.2% of total liabilities, whereas the net position against non-financial corporations was nearly balanced and the net position against the central bank was positive.

If we include foreign currency-indexed kuna-denominated domestic loans in the above figures, the total net foreign currency liability position turns into a net foreign currency asset position of around 7% of total assets at end-2004.

It is essential to distinguish between this balance sheet position and banks' overall net open foreign exchange position, as the latter may be influenced also by off-balance sheet items. According to data provided by Hrvatska Narodna Banka, banks had a long overall net foreign exchange position (including off-balance sheet items) of 16.7% of regulatory capital at end-2003, which corresponded to

approximately 1.6% of total assets and represented an increase from a long position of 4.6% of regulatory capital in 2001 (0.5% of total assets). On the basis of this information, the direct exchange rate risk has to be assessed as being rather modest, and banks would be affected negatively only in the event of an appreciation of the kuna. This view is also supported by the IMF's Financial System Stability Assessment of Croatia in 2002. However, Croatian banks face an indirect foreign exchange risk in the event of a kuna depreciation (see section 7) given the high share of foreign currency-denominated and foreign currency-linked loans in banks' credit portfolio.

6 Monetary Policy and the Banking Sector

Excessive developments in banks' net foreign assets and domestic loans have repeatedly caused concern to Hrvatska Narodna Banka over the past few years (e.g. in 1998, 2001 and 2003). As foreign currencies are a major factor in banks' assets and liabilities, interest rate management plays a rather subordinate role in the Croatian monetary policy framework. Instead, the central bank relies heavily on mandatory reserve regulations, foreign currency asset/liability ratios, quantitative measures such as temporary limits on lending or on selected liability items.

Thus, the development of the level and composition of net foreign currency assets was not only influenced by macroeconomic factors that affected banks' net foreign asset development, but also by central bank regulations.

Amendments to mandatory reserve regulations not only referred to the level of reserve ratios and to the

range of liabilities to be covered by the minimum reserves (a cumulative broadening of the mandatory reserve base was implemented, especially with regard to foreign currency liabilities), but also to the range of instruments eligible for holding reserves: Before mid-1998, banks had been allowed to hold all foreign currency-denominated mandatory reserves for foreign currency liabilities with foreign banks with an acceptable rating. The amended regulation obliged them to hold at least half of these reserves in a foreign exchange account with the central bank; this helps explain the sharp decline in foreign assets in 1998. Similarly, the rise in the maximum allocation of foreign currency-denominated reserves for foreign currency liabilities outside the central bank (from 50% to 60%) in 2000 may have contributed to driving up the share of foreign currency-denominated foreign assets in total foreign currency assets in the same year. In December 2003, the maximum allocation of foreign currency-denominated reserves outside the central bank was reduced to 40%.⁷

Moreover, starting from September 2001, banks had to gradually raise the share of reserves required for foreign currency liabilities which had to be allocated in kuna (instead of foreign currencies). The prescribed level of that share was initially set at 10% and stood at 42% by end-2004. In May 2005, this share was hiked to 50%. This adjustment was motivated by the aim to achieve a unification of the minimum reserve regulations for domestic and foreign currency liabilities. Together with the gradual reduc-

tion of the reserve requirement rate, this effort led to a stable level of banks' foreign currency-denominated mandatory reserve holdings in nominal terms and has supported a decline in foreign currency assets in percent of total assets since then.

In addition to mandatory reserve requirements, Croatian banks have traditionally had to maintain a minimum coverage of their foreign currency liabilities by holding short-term foreign currency assets. As from the beginning of February 2003, Hrvatska Narodna Banka extended the basis for calculating this coverage and required that the coverage should be maintained on a daily basis (rather than on the last day of each month) and lowered the coverage ratio from 53% to 35%. These adjustments implied a net tightening. It should be noted that mandatory reserves held in foreign currencies may form part of the short-term foreign currency assets required to fulfill this coverage ratio. In February 2005, the central bank lowered the coverage ratio again from 35% to 32% with the intention to improve banking sector liquidity ahead of the maturity of government Eurobonds at the end of March 2005. Refinancing these Eurobonds domestically seemed preferable to issuing a new Eurobond given Croatia's commitment towards the IMF to stabilize or reduce its foreign indebtedness.

In 2003, the Croatian central bank imposed credit limits in order to contain high domestic lending growth financed by external borrowing by banks. Since this measure did not prevent banks' foreign liability position from deteriorating further, the central

⁷ This ceiling applies to foreign currency-denominated reserves for foreign currency liabilities to residents while all foreign currency-denominated reserves for foreign currency liabilities to non-residents have to be held with the central bank.

bank introduced a so called marginal reserve requirement in July 2004. It requires banks to deposit a specified percentage of the net increase in their foreign liabilities above the level registered in June 2004 free of interest with the central bank. This ratio stood at 24% between July 2004 and January 2005 and was raised to 30% in February and further to 40% in May 2005.

The changes in these instruments have helped to achieve monetary policy objectives such as to reduce the current account deficit and they have improved the prudential situation of the banks. But they have also had some adverse side effects: Changes in the mandatory reserve ratio do not only influence lending behavior, but also directly affect banks' profitability. Despite several cuts over the past few years, the mandatory reserve ratio remained high at 18% in October 2004 in Croatia (for both domestic and foreign currency liabilities), with a relatively modest remuneration rate. In addition, the requirement on banks to allocate an increasing part of their mandatory reserves for foreign currency liabilities in kuna may have contributed to the currency mismatch on their balance sheets. Moreover, the requirement to maintain a minimum coverage of their foreign currency liabilities by holding short-term foreign currency claims on a daily basis has also had a direct negative side effect on profitability since it reduced the scope for more attractive investments.

In addition to the positive macroeconomic effects and the negative side effects on banks, such administrative measures also increase the risk of circumvention. Hrvatska Narodna Banka observed that banks made use of syn-

ergy effects, allocating financial assets among group members in a way that gave them better control over lending growth after the introduction of credit limits in 2003. Lending was shifted to leasing companies, housing savings banks and asset management companies, and trading in loans and loan portfolios among banks was intensified. Furthermore, doubtful loans were increasingly written down to make room for new lending without violating the imposed credit limits. Similar circumvention strategies in other cases may have been the reason why Hrvatska Narodna Banka tried to respond to adverse economic developments in the past through measures affecting banks' assets or measures affecting their liabilities. Finally, given that banks majority-owned by foreign investors dominate the Croatian banking sector, limitations on domestic lending may channel the demand for domestic loans abroad. After developing along a stable path for several years in all sectors except monetary financial institutions and the general government, net foreign debt has been surging since late 2002, which may be attributed to the reduced availability of domestic credit. Thus, imposing credit limits may have led to an increase in the corporate sector's foreign exchange mismatch in excess of the natural hedge (from exports earnings); this may translate into an additional credit risk for the banking sector. By contrast the introduction of credit limits may to some extent have served its purpose of dampening – *ceteris paribus* – kuna-denominated lending funded by foreign liabilities, thus limiting the banking sector's on-balance foreign exchange mismatch.

7 Asset Quality

The rising level of banking intermediation and the increased share of lending to the domestic private sector have occurred along with an improvement in banks' asset quality over the past five years. The 1998 banking crisis and the subsequent write-off of bad loans as well as the intensified entry of foreign investors and Croatian banks' improved management skills have strongly contributed to this development.

As a result, the share of standard assets in total assets rose from 85.1% in 1998 to 92.2% in 2002, before falling back slightly to 91.8% by end-2003. Between 1998 and 2003, the steepest decline in percentage points was registered for the share of substandard assets, followed by watch assets. After peaking at 3.2% in 1999, the share of doubtful assets declined sharply to 1.3% in 2003, while the share of loss assets decreased from 2.1% (1998) to 1.6% (2003) of total assets. In sum, nonperforming assets⁸

accounted for 5.1% of total assets by end-2003, down from 9.3% in 1998, and classified assets amounted to 8.2% of total assets, down from 14.9% in 1998. This development is in line with that of other CEECs.

In parallel to this asset quality improvement, the share of reserves and provisions in percent of total assets has declined over the past few years to reach 4.1% by end-2003. At the same time, however, the coverage of nonperforming assets by reserves and provisions improved from 71.8% in 1998 to 85.1% in 2002. More recent developments suggest that the decline in this coverage ratio to 79.4% in 2003 should be assessed against the backdrop of an increase in banks' (watch and) substandard credit ratios (the percentage share of doubtful and loss assets, by contrast, decreased further). If the quality of these assets should deteriorate further, it would incur additional risk provisioning costs and burden banks' future profits to the same extent.

Table 7

Asset Quality

%	1997	1998	1999	2000	2001	2002	2003
Standard assets ratio	88.8	85.1	85.5	87.5	90.5	92.2	91.8
Watch assets ratio	5.3	5.6	4.2	3.0	2.2	1.9	3.0
Substandard assets ratio	3.3	4.9	3.5	2.5	2.1	2.0	2.3
Doubtful assets ratio	0.8	2.4	3.2	3.1	2.3	1.5	1.3
Loss assets ratio	1.8	2.1	3.6	3.9	2.8	2.3	1.6
Reserves and provisions ratio	4.9	6.7	8.8	8.2	6.2	5.0	4.1

Source: Hrvatska Narodna Banka, OeNB calculations.

The assessment of asset quality is further complicated by the high share of foreign currency-denominated claims in total domestic claims. Unhedged debt denominated in foreign currencies or linked to foreign currencies (in particular to households)

makes borrowers' debt servicing ability susceptible to a potential large depreciation of the kuna. This translates into an indirect foreign exchange risk for banks. However, given the household sector's large positive net foreign exchange position against the

⁸ Nonperforming assets are defined as substandard, doubtful and loss assets. Classified assets are defined as watch assets plus nonperforming assets.

banking sector (i.e. deposits in excess of loans), the risk of household loan losses depends on the degree to which the holders of foreign currency(-indexed) loans and the holders of foreign currency deposits are different entities. With respect to the total corporate sector – which does not have a very sizeable net foreign exchange exposure against the domestic banking sector, either – the additional credit risk emanating from foreign exchange exposure as a result of direct cross-border lending has to be taken into account.

It is difficult to estimate the magnitude of the exposure to credit risk stemming from indirect foreign exchange rate risk. However, IMF calculations in the framework of Croatia's Financial System Stability Assessment 2002 suggest that an assumed depreciation of the kuna in the range of 15 to 25 percentage points would result in a declining capital adequacy ratio (CAR) from 18.8% to approximately 7% to 12%, depending on the selection of assumed default and recovery rates.

With regard to banks' intensified lending to households over the past few years, it should be noted that the share of (relatively less risky) housing loans in total loans to households fell from 39% in 1999 to 31% by 2001 and has been stable ever since.

8 Capital Adequacy and Liquidity

The overall capital adequacy ratio (CAR) of Croatian banks fell from 21.3% at the end of 2000 to 14.5% by end-September 2004. However, this value is still in line with other CEECs and well above the value recorded in 1998 (12.7%). The decline in CAR since 2000 may be entirely attributed to stronger dynamics in banks' risk component, which has been growing at a faster rate than regulatory capital. The development of the risk component has been driven by the shift in banks' business orientation away from lending to the general government toward lending to the (more risky) private sector.

Table 8

Capital Adequacy and Liquidity

%	1997	1998	1999	2000	2001	2002	2003	end-Sept. 2004
Capital adequacy ratio	16.4	12.7	20.6	21.3	18.5	17.2	16.2	14.5
Short-term assets/short-term liabilities	..	..	88.9	91.6	106.7	111.8	115.2	..
Credit-to-deposit ratio (excl. blocked and restricted deposits)	86.6	95.7	95.9	81.5	70.9	86.9	92.5	95.8
Credit-to-deposit ratio (incl. blocked and restricted deposits)	77.9	89.4	90.3	78.7	69.9	85.6	91.3	94.4
Open foreign exchange position as a percentage of regulatory capital	..	..	43.3	29.9	4.3	14.3	16.7	..

Source: Hrvatska Narodna Banka, OeNB calculations.

With regard to short-term liquidity, the ratio between short-term assets and short-term liabilities improved steadily between 1999 (88.9%) and 2003 (115.2%). The high liquidity ratio is supported by

prudential requirements, such as a relatively high mandatory reserve ratio (18%) and the requirement to maintain a certain ratio (35%) between banks' short-term foreign currency claims and foreign currency liabilities.

Parallel to the decline in the capital adequacy ratio, the (domestic) credit-to-deposit ratio increased between 2002 and 2004, thus reversing a trend that had occurred between 1999 and 2001 as a result of disproportionate deposit growth, which had been linked to increased households' foreign currency deposits in the run-up to the euro cash change-over.

9 Banking System Profitability

The profitability of Croatian banks improved significantly after the banking crisis in 1998. While return on assets (ROA) and return on equity (ROE) were in deeply negative ranges in 1998, they rose to 1.3% and 14.5%

in 2003. Given the declining inflation rate over this period, real ROE hit 12.4% in 2003, which was in line with the average development in the CEECs.

Despite the broad stability of the interest rate spread over the past few years, net interest income as a percentage of total average assets has declined. The development of banks' overall net position against all domestic sectors (including MFIs)⁹ and their net foreign asset position suggest that this decline may be attributed to the declining share of net interest-bearing assets in total assets. In comparison, the share of net interest income in total operating income has trended modestly higher since 1999.

Table 9

Profitability Indicators

	1998	1999	2000	2001	2002	2003
Net interest income/total assets average	4.4	3.9	4.2	3.6	3.3	3.4
Operating income/total assets average	6.1	6.0	6.1	4.5	4.6	4.5
Cost/income ratio	58.5	54.2	56.7	65.6	59.3	57.3
Net costs of loan loss provisioning/operating income	86.8	32.0	20.6	13.7	6.6	7.0
Return on Assets (ROA)	-2.9	0.7	1.3	0.7	1.3	1.3
ROA deflated by CPI	-8.4	-3.5	-4.9	-4.1	-0.4	-0.5
Return on Equity (ROE)	-16.1	4.8	10.7	6.6	13.7	14.5
ROE deflated by CPI	-20.8	0.4	4.0	1.5	11.8	12.4

Source: Hrvatska Narodna Banka, OeNB calculations.

A lower level of net interest income (as a percentage of total average assets) and of noninterest income caused a decline in operating income (as a percentage of total assets). Following deterioration between 1999 and 2001, the cost-income ratio improved in 2002 and 2003. This, together with a sharp decline in the cost of loan loss provisioning, has been the main driving force behind the improvement in Croatian banks' profitability over the past few years.

10 Austrian Banks in Croatia

Over the past few years, all major Austrian banking groups have bought stakes in existing Croatian banks or established their own subsidiaries in Croatia. The following banks are currently active on the Croatian market: Erste Bank, Bank Austria Creditanstalt, Hypo Alpe-Adria-Bank, Raiffeisen International and Volksbank. According to data provided by Hrvat-

⁹ Net claims are defined as domestic claims excluding bonds for blocked foreign exchange deposits less deposits by domestic sectors excluding blocked foreign exchange deposits and restricted deposits.

Table 10

Selected Indicators of Austrian Banks' Subsidiaries in Croatia in 2004

	Total assets HRK million	Share in total assets in %	Asset growth in %	Pre-tax in- come (loss) HRK million	Core capital HRK million	ROE (pre-tax) in %	Capital adequacy ratio in %
Erste & Steiermärkische Bank d.d.	25,822	11.2	32.3	364.1	1,387	26.3	12.3
HVB Splitska Banka d.d.	21,460	9.3	12.7	241.0	1,209	19.9	11.1
Hypo Alpe-Adria-Bank d.d.	17,143	7.4	21.9	287.1	1,162	24.7	18.7
Slavonska Banka d.d.	5,553	2.4	19.4	54.4	702	7.8	25.1
Raiffeisenbank Austria d.d.	24,404	10.6	31.2	208.3	1,012	20.6	11.3
Volksbank d.d.	3,620	1.6	35.2	19.1	181	10.5	12.3
Total	98,002	42.6	x	1,173.9	5,653	20.8	x
All Croatian banks	230,292	100.0	12.8	3,692.8	16,452	22.4	14.1

Source: Hrvatska Narodna Banka.

Note: Slavenska Banka d.d. is a subsidiary of Hypo Alpe-Adria-Bank.

ska Narodna Banka, the total assets of Austrian banks' subsidiaries amounted to almost EUR 13 billion at the end of 2004, securing them a market share in total banking sector assets of 42.6%. Their share in the combined pre-tax income of Croatian banks was somewhat lower (31.8% in 2004). However, the performance of Austrian banks' subsidiaries was in line with their competitors when measured by ROE (pre-tax income as a percentage of core capital by the end of 2004). Moreover, Austrian banks' subsidiaries belonged to the most dynamic banks in Croatia in 2004, most of them recording an above-average growth in their assets.

By end-September 2004, Austrian banks' subsidiaries in Croatia accounted for approximately 13% of the combined assets of Austrian banks' subsidiaries in the CEE region, coming fifth (out of 14) after those in the Czech Republic, Poland, Hungary and Slovakia. In terms of profitability (as measured by after-tax earnings), subsidiaries in Croatia rank fifth and account for 10.1% of the total earnings of CEE subsidiaries of Austrian banks. As a result of this combination (a higher share in total assets and a somewhat lower share in total earnings), the subsidiaries in Croatia occupy

rank eight of twelve in the CEE ranking of return on assets.

In addition to the presence of their subsidiaries, Austrian banks also provide cross-border lending to the Croatian nonbank sector. By end-2004, the total volume of such cross-border lending (including securities) amounted to EUR 4.1 billion (almost 20% of Croatia's total gross foreign debt), representing 2.6% of Austrian banks' total cross-border lending, but approximately 12% of their cross-border lending to CEECs.

11 Summary

After the banking crisis of 1998, which caused several banks to exit from the market, the Croatian banking system has undergone a deep transformation process in the course of which the remaining state-owned banks have been privatized and foreign investors have gained a dominating market share of more than 90% of total banking sector assets. The degree of banking intermediation is relatively high in Croatia compared to other CEECs, but a comparison with the euro area average still suggests a huge growth potential for the future. Banking sector assets are dominated by claims on domestic sectors; in recent years, the importance of lending to

the private sector (mostly to households), has risen whereas lending to the general government has declined. Domestic claims are dominated by loans, whereas securities continue to play a subordinate role. Even after the outstanding volume of special-purpose government bonds decreased, debt securities holdings are almost exclusively holdings of central government debt. While Croatian banks maintained a positive net position (claims less deposits) against the domestic sectors, their net foreign asset position has varied over time (reflecting the economic cycle and the credit cycle, funding costs and changes in central bank regulations aimed at limiting excessive foreign-financed domestic loan growth). Despite all efforts to substitute foreign currencies by domestic currency in business activities, the former continue to play an important role for Croatian banks, in particular for the liabilities side of the banks' balance sheets. Banks maintain a positive net foreign currency position on their balance sheets (with increasing net liabil-

ities to nonresidents), and also in overall (on-balance and off-balance) terms. Still, foreign currency(-indexed) lending is highly significant as it represents a credit risk in the form of an indirect exchange rate risk. By contrast, asset quality has improved significantly over the past five years, despite the reorientation of banks toward lending to the riskier private sector. Despite a decline in the capital adequacy ratio owing to a stronger increase in the risk component than in the capital base, Croatian banks seem to be well capitalized and are in a satisfactory liquidity position. The profitability of banks has improved significantly since the 1998 banking crisis, and real ROE in Croatia is now in line with that observed in other CEECs. This improvement was primarily caused by a decrease in the cost of loan loss provisioning and a decline in the cost-income ratio in 2002 and 2003. Austrian banks play a prominent role in the Croatian banking sector, not only through their subsidiaries but also because of their cross-border lending activity.

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Cutoff date for data: May 11, 2005.

Conventions used in the tables:

× = For technical reasons no data can be indicated.

.. = 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)

	2001	2002	2003	2004	2001	2002	2003	2004
	Year				2nd half			
U.S. dollar	0.8956	0.9449	1.1309	1.2434	0.8986	0.8983	1.1577	1.2599
Japanese yen	108.73	118.06	130.96	134.4	108.03	116.24	130.85	135.75
Pound sterling	0.6219	0.6288	0.6919	0.6786	0.6235	0.6214	0.6983	0.6836
Swiss franc	1.5104	1.4672	1.5207	1.5439	1.5307	1.4691	1.3383	1.5349
Czech koruna	34.051	30.804	31.847	31.898	34.544	31.060	32.140	31.359
Hungarian forint	256.42	242.57	253.51	251.68	261.66	243.19	259.74	247.37
Polish zloty	3.6689	3.8559	4.3987	4.5290	3.6294	3.6667	4.5245	4.3289
Slovak koruna	43.293	42.673	41.485	40.024	43.418	42.595	41.469	39.738
Slovenian tolar	218.116	226.256	233.842	239.073	216.4035	224.0450	235.5186	239.892

Source: Thomson Financial.

Table A2

Key Interest Rates

End of period, %

	2001		2002		2003		2004	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Euro area	4.50	3.25	3.25	2.75	2.00	2.00	2.00	2.00
U.S.A.	3.25	1.25	1.25	1.25	1.25	0.75	1.25	2.00
Japan	0.25	0.10	0.10	0.10	0.10	0.10	0.10	0.10
United Kingdom	5.25	4.00	4.00	4.00	3.75	3.75	4.50	4.75
Switzerland ¹⁾	2.75–3.75	1.25–2.25	0.75–1.75	0.25–1.25	0.00–0.75	0.00–0.75	0.00–1.00	0.25–1.25
Czech Republic	5.00	4.75	3.75	2.75	2.25	2.00	2.25	2.50
Hungary	11.25	9.75	9.00	8.50	9.50	12.50	11.50	9.50
Poland	15.50	11.50	8.50	6.75	5.25	5.25	5.25	6.50
Slovak Republic	8.80	8.80	8.25	6.50	6.50	6.00	4.50	4.00
Slovenia ²⁾	11.16	8.00	8.75	8.25	6.50	6.00	4.00	4.00

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, %

	2001	2002	2003	2004	2001	2002	2003	2004
	Year				2nd half			
Euro area	4.26	2.94	2.33	2.11	3.86	3.23	2.14	2.14
U.S.A.	3.78	1.41	1.22	1.62	2.80	1.68	1.15	2.03
Japan	0.16	0.08	0.09	0.09	0.08	0.08	0.09	0.09
United Kingdom	4.97	3.96	3.69	4.59	4.50	3.95	3.70	4.85
Switzerland	2.94	0.69	0.33	0.47	2.56	0.80	0.26	0.65

Source: Thomson Financial.

Table A4

Long-Term Interest Rates

Ten-year rates, period average, %

	2001	2002	2003	2004	2001	2002	2003	2004
	Year				2nd half			
Euro area	5.03	4.92	4.16	4.45	5.20	4.79	4.49	4.35
U.S.A.	5.01	4.60	4.00	4.26	4.87	4.12	4.25	4.23
Japan	1.34	1.27	0.99	1.50	1.36	1.13	1.29	1.55
United Kingdom	5.01	4.91	4.58	4.93	4.98	4.62	4.81	4.88
Switzerland	3.38	3.20	2.66	2.74	3.30	2.88	2.83	2.66

Source: Thomson Financial.

Table A5

Corporate Bond Spreads

Period average, percentage points

	2001	2002	2003	2004	2001	2002	2003	2004
	Year				2nd half			
Euro corporate bond spreads against euro benchmark	1.17	1.20	0.35	-0.14	1.25	1.41	0.07	-0.14
U.S. dollar corporate bond spreads against U.S. dollar benchmark	5.48	5.50	4.57	2.91	4.99	6.27	3.78	2.93

Source: Thomson Financial.

Table A6

Stock Indices¹⁾

Period average

	2001	2002	2003	2004	2001	2002	2003	2004
	Year				2nd half			
Euro area: EURO STOXX	336.29	259.97	231.29	251.14	305.99	220.35	227.32	251.59
U.S.A.: S&P 500	1,193.78	995.34	964.85	1,131.10	1,133.37	892.05	1,028.66	1,134.02
Japan: Nikkei 225	12,114.46	10,119.31	9,312.89	11,180.89	10,873.50	9,277.12	10,243.21	11,089.72
Austria: ATX	1,157.84	1,183.94	1,303.80	1,979.87	1,138.04	1,115.35	1,397.95	2,121.61
Czech Republic: PX50	411.17	437.64	556.98	828.23	373.40	505.29	608.51	885.05
Hungary: BUX	6,899.95	7,759.55	8,383.61	11,752.24	6,639.13	7,761.97	8,996.01	12,832.75
Poland: WIG	14,376.07	14,440.59	17,073.89	24,108.88	1,169.02	1,151.24	1,501.21	24,841.21
Slovak Republic: SAX16	242.93	186.02	165.08	213.42	113.11	118.41	171.34	243.28
Slovenia: SBI20	1,888.94	2,846.88	3,373.41	4,561.37	1,989.99	3,216.29	3,523.23	4,778.30

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 = 1000, PX50: April 6, 1994 = 100, BUX: January 2, 1991 = 100, WIG: April 16, 1991 = 100, SAX16: September 14, 1993 = 100, SBI20: January 3, 1994 = 100.

Table A7

Gross Domestic Product

Annual change in %, period average

	2001	2002	2003	2004	2001	2002	2003	2004
Year					2nd half			
Euro area	1,6	0,9	0,5	2,1	1,2	1,1	0,6	1,8
U.S.A.	0,8	1,9	3,0	4,4	0,3	2,4	4,0	4,0
Japan	0,2	-0,3	1,4	2,7	-1,2	1,1	1,6	1,7
Austria	0,7	1,2	0,8	2,0	0,2	1,2	1,0	2,5
Czech Republic	2,6	1,5	3,7	4,0	2,2	1,2	4,0	4,2
Hungary	3,8	3,5	3,0	4,0	3,6	3,8	3,4	3,8
Poland	1,0	1,4	3,8	5,3	0,5	2,0	4,4	4,3
Slovak Republic	3,8	4,6	4,5	5,5	4,4	5,0	4,8	5,5
Slovenia	2,7	3,3	2,5	4,6	2,4	3,6	2,7	4,6

Source: Eurostat, national sources.

Table A8

Current Account

% of GDP, cumulative

	2001	2002	2003	2004	2001	2002	2003	2004
Year					2nd half			
Euro area	0,4	1,0	0,4	0,8	2,0	0,8	1,4	1,7
U.S.A.	-3,7	-4,4	-4,7	-5,5	-4,0	-4,6	-4,6	-6,0
Japan	2,1	2,8	3,2	3,3	x	x	x	x
Austria	-1,9	0,3	-0,5	0,3	-2,0	-0,7	-1,5	-1,2
Czech Republic	-5,4	-5,7	-6,3	-5,2	-5,4	-7,3	-8,9	-6,6
Hungary	-6,2	-7,1	-8,7	-8,9	-4,1	-7,7	-8,0	-8,4
Poland	-2,9	-2,7	-2,2	-1,5	-1,9	-1,8	-1,4	-1,0
Slovak Republic	-8,4	-8,0	-0,8	-3,6	-8,8	-8,2	-0,4	-4,1
Slovenia	0,2	1,4	-0,4	-0,7	0,7	1,8	0,0	-0,5

Source: Eurostat, 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

	2001	2002	2003	2004	2001	2002	2003	2004
Year					2nd half			
Euro area	2,3	2,3	2,1	2,1	2,2	2,2	2,1	2,3
U.S.A.	2,8	1,6	2,3	2,7	2,3	1,9	2,1	3,2
Japan	-0,6	-0,9	-0,3	0,0	-0,9	-0,7	-0,3	0,2
Austria	2,3	1,7	1,3	2,0	2,3	1,7	1,2	2,2
Czech Republic	4,5	1,4	-0,1	2,6	4,5	0,2	0,3	2,9
Hungary	9,1	5,2	4,7	6,8	7,9	4,7	5,0	6,5
Poland	5,3	1,9	0,7	3,6	4,1	1,2	1,0	4,6
Slovak Republic	7,2	3,5	8,5	7,4	7,2	3,0	9,2	6,6
Slovenia	8,6	7,5	5,7	3,6	8,0	7,2	5,3	3,6

Source: Eurostat.

The Real Economy in Austria

Table A10

Financial Investment of Households								
Transactions, EUR million								
	2001	2002	2003	2004 ¹⁾	2001	2002	2003	2004 ²⁾
	Year				2nd half			
Currency and deposits ¹⁾	4,314	7,602	8,166	5,910	2,059	4,529	3,737	3,460
Securities (other than shares) ²⁾	-327	1,607	1,449	2,484	-232	236	1,531	506
Shares (other than mutual fund shares)	1,143	705	894	1,100	951	416	209	399
Mutual fund shares	2,894	483	1,119	2,886	749	602	251	999
Insurance technical reserves	3,398	2,949	3,300	4,786	1,585	1,508	944	2,067
Total financial investment	11,422	13,346	14,928	17,166	5,112	7,291	6,672	7,430

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				
	2001	2002	2003	2004 ¹⁾
	Year			
Net disposable income ¹⁾	132.6	134.4	138.6	143.6
Savings	10.1	10.5	12.5	13.2
Saving ratio in % ²⁾	7.6	7.8	8.9	9.2
MFI loans to households	79.87	86.65	89.75	97.54

Source: Statistics Austria (national accounts broken down by sectors), OeNB (financial accounts).
¹⁾ WIFO forecast of March 2005.
²⁾ Saving ratio = savings / (disposable income + increase in accrued occupational pension benefits).

Table A12

Financing of Nonfinancial Corporations								
Transactions, EUR million								
	2001	2002	2003	2004 ¹⁾	2001	2002	2003	2004 ²⁾
	Year				2nd half			
Securities (other than shares)	600	-410	4,296	2,938	1,272	-388	4,123	2,054
Loans ¹⁾	11,338	6,457	4,999	4,864	7,559	3,535	1,829	4,112
Shares and other equity	4,881	7,849	5,015	4,660	2,161	1,239	396	1,102
Other accounts payable	41	1,216	1,982	623	384	774	2,104	523
Total debt	16,860	15,112	16,292	13,085	11,376	5,160	8,452	7,791

Source: OeNB.
¹⁾ Half-year figures include other liabilities.
²⁾ Preliminary data.

Table A13

Insolvency Indicators

	2001	2002	2003	2004	2001	2002	2003	2004
	Year				2nd half			
Default liabilities in EUR million	3,503	3,422	2,440	2,540	1,433	1,770	1,182	1,371
Number of defaults	2,939	2,864	2,957	2,972	1,481	1,441	1,542	1,503

Source: Kreditschutzverband von 1870.

Table A14

Selected Financial Ratios of the Manufacturing Sector

Median, %

	2001	2002	2003
Self-financing and investment ratios			
Cash flow, as a percentage of turnover	7.35	7.47	6.95
Cash flow, as a percentage of investment	181.18	194.62	183.87
Reinvestment ratio ¹⁾	69.23	70.28	77.78
Financial structure ratios			
Equity ratio	11.03	13.90	17.94
Risk-weighted capital ratio	16.46	19.45	24.11
Bank liability ratio	46.47	42.94	38.76
Government debt ratio	9.78	9.49	8.86

Source: OeNB.

¹⁾ Investment x 100 / credit write-offs.

Financial Intermediaries in Austria

Table A15

Total Assets and Off-Balance-Sheet Operations								
End of period, EUR million	2001		2002		2003		2004	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
	Total assets	567,250	587,741	587,611	573,349	591,867	605,107	636,035	652,759
of which: total domestic assets	413,701	431,415	426,245	418,141	419,571	430,888	441,250	452,307
total foreign assets	153,548	156,326	161,366	155,208	172,296	174,219	194,785	200,452
Interest rate contracts	677,098	946,631	1,022,741	1,144,431	2,204,721	1,853,494	1,891,262	1,241,189
Foreign exchange derivatives	164,435	157,512	202,939	240,542	298,475	305,447	255,755	216,284
Other derivatives	5,727	5,737	7,554	3,814	4,304	15,173	17,374	8,490
Derivatives total	847,259	1,109,880	1,233,235	1,388,787	2,507,501	2,174,114	2,164,391	1,465,963

Source: OeNB.

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

Table A16

Profitability								
End of period, EUR million	2001	2002	2003	2004	2001	2002	2003	2004
	1st half				Year			
	Interest receivable and similar income	14,245	11,858	10,604	10,334	26,814	23,426	20,732	21,270
Interest payable and similar charges	10,876	8,339	7,107	6,804	19,725	16,345	13,674	14,138
Net interest income	3,369	3,518	3,497	3,530	7,089	7,081	7,058	7,132
Income from securities and participating interests	781	828	812	990	1,959	1,771	1,719	2,076
Net fee-based income	1,568	1,514	1,553	1,671	3,062	3,012	3,188	3,387
Net profit/loss on financial operations	250	197	384	310	521	570	618	608
Other operating income	638	629	591	584	1,423	1,284	1,292	1,269
Operating income	6,606	6,685	6,837	7,085	14,054	13,718	13,875	14,471
Staff costs	2,294	2,380	2,368	2,382	4,681	4,781	4,740	4,860
Other administrative expenses	1,512	1,524	1,508	1,511	3,151	3,139	3,108	3,107
Other operating expenses	757	781	768	774	1,645	1,582	1,620	1,762
Total operating expenses	4,564	4,686	4,645	4,666	9,476	9,502	9,468	9,729
Operating profit/loss	2,043	2,000	2,192	2,418	4,577	4,216	4,407	4,742

Source: OeNB.

Table A17

Expected Annual Profit/Loss								
Expected year-end value, EUR million	2001		2002		2003		2004	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
	Expected operating profit/loss for the year	3,848	4,533	4,002	4,177	3,929	4,374	4,506	4,704
Expected operating profit/loss on ordinary activities	2,794	3,151	2,021	2,065	2,278	2,686	3,354	3,565
Expected annual surplus	2,252	2,688	1,514	1,439	1,777	2,146	2,824	2,981

Source: OeNB.

Table A18

Claims on Domestic Nonbanks

End of period, EUR million

	2001		2002		2003		2004	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Nonfinancial corporations	113,303	114,648	113,843	111,588	111,178	110,840	108,388	109,994
Households	77,428	79,751	81,507	84,618	84,723	87,358	94,576	97,055
General government	28,798	28,275	28,724	28,333	27,501	29,950	29,679	31,242
Other financial intermediaries	11,108	11,893	12,309	12,771	12,908	13,392	13,505	14,511
Total	230,638	234,566	236,383	237,310	236,309	241,540	246,147	252,802

Source: OeNB.

Note: Due to changes in the reporting system as of the reporting month of June 2004, the time series for nonfinancial 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 Nonbanks

End of period, EUR million

	2001		2002		2003		2004	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Nonfinancial corporations	20,011	20,221	20,364	19,532	18,177	17,791	17,343	16,105
Households	18,565	19,502	20,594	22,066	21,810	23,691	27,077	28,451
General government	1,692	1,362	1,682	1,395	1,567	1,232	1,588	1,688
Other financial intermediaries	1,326	1,336	1,342	1,466	1,394	1,412	1,594	1,667
Total	41,594	42,420	43,983	44,459	42,948	44,125	47,602	47,911

Source: OeNB.

Note: Due to changes in the reporting system between May and June 2004, the time series for nonfinancial corporations and households had to be adjusted. Freelance professionals and self-employed persons are now classified under households.

Table A20

Foreign Currency-Denominated Claims on Domestic Non-MFIsEnd of period, % of total foreign currency-denominated claims on euro area non-MFIs¹⁾

	2001		2002		2003		2004	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Swiss franc	53.2	52.1	51.4	56.8	72.4	81.6	86.0	90.1
Japanese yen	40.7	42.3	42.2	37.7	21.6	12.2	7.1	5.6
U.S. dollar	5.2	5.2	6.0	5.0	5.2	5.0	5.6	3.6
Other foreign currencies	0.9	0.4	0.3	0.4	0.7	1.2	1.3	0.7

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. Figures do not add up to 100.0% for every year due to rounding.

Table A21

Specific Loan Loss Provisions for Claims on Nonbanks

End of period, % of claims	2001		2002		2003		2004	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Specific loan loss provisions	3.2	3.1	3.4	3.3	3.5	3.3	3.4	3.3

Source: OeNB.

Table A22

Market Risk¹⁾

End of period, EUR million	2001		2002		2003		2004	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Interest rate risk Capital requirement for the position risk of interest rate instruments in the trading book	587.8	394.1	427.2	415.3	420.6	470.2	514.8	609.8
Exchange rate risk Capital requirement for open foreign exchange positions	96.9	64.0	70.3	80.4	81.8	54.9	66.1	52.9
Equity price risk Capital requirement for the position risk of equities in the trading book	43.8	28.5	33.6	20.5	25.4	28.4	52.4	43.4

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.

Table A23

Liquidity Risk

End of period, %	2001		2002		2003		2004	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Liquid resources of the first degree: 5% quantile of liquidity ratio ¹⁾	12.4	5.9	11.5	6.1	7.1	4.5	4.3	4.3
Liquid resources of the second degree: 5% quantile of liquidity ratio	26.4	27.3	27.3	26.1	28.2	25.2	25.7	24.4

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 A24

Solvency

	2001		2002		2003		2004	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
End of period, EUR million								
Total tier 1 capital (core capital)	26,930	27,440	28,368	26,861	28,181	29,704	31,564	32,101
Total tier 2 capital (supplementary capital)	13,512	13,492	14,159	13,485	14,170	14,941	16,059	16,742
Tier 3 capital ¹⁾	1,251	2,413	2,197	2,324	771	803	764	674
End of period, eligible capital as a percentage of risk-weighted assets								
Capital adequacy ratio ²⁾	14.0	13.7	14.2	13.3	13.9	14.9	14.8	14.7

Source: OeNB.

¹⁾ Due to an amendment to the applicable law, data are only available as of 2000.²⁾ 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 A25

Assets Held by Austrian Insurance Companies¹⁾

End of period, EUR million	2001		2002		2003		2004	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Cash, overnight deposits	531	757	764	681	1,246	869	753	924
Other deposits at Austrian banks	483	1,425	678	947	2,371	1,237	991	1,578
Domestic debt securities	7,840	7,712	7,600	7,736	8,488	9,101	9,175	8,884
Equity securities and other domestic securities	12,599	13,127	14,616	15,043	14,648	15,204	15,987	17,470
Loans	10,455	8,769	8,518	8,055	7,441	7,303	6,733	6,497
Domestic equity interests	2,293	2,511	2,784	3,308	3,550	3,588	3,682	3,909
Real estate	3,443	3,494	3,804	3,553	3,526	3,573	3,438	3,383
Foreign assets	13,074	14,397	14,959	15,709	15,597	17,261	19,209	20,623
Custody account claims on deposits on reinsurers	..	1,854	..	2,042	..	2,148	..	..
Other assets	3,085	3,426	3,310	3,329	3,734	3,549	4,068	3,103
Total assets	..	57,471	..	60,403	..	63,833	..	68,280

Source: OeNB.

¹⁾ Semiannual data exclusive of reinsurance transactions, based on quarterly returns.

Table A26

Assets in Austrian Mutual Funds

End of period, EUR million	2001		2002		2003		2004	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Domestic securities	35,154	36,068	36,471	35,952	34,653	34,309	35,405	37,341
of which: federal treasury bills and notes	25	27	28	28	..	..	..	..
debt securities	23,828	23,235	22,975	22,519	20,743	19,436	19,058	19,025
equity securities	11,301	12,806	13,468	13,405	13,910	14,873	16,347	18,316
Foreign securities	56,697	57,324	60,701	60,712	66,706	69,435	75,708	80,506
of which: debt securities	32,944	34,717	40,498	43,200	48,531	48,952	53,022	56,821
equity securities	23,753	22,607	20,203	17,513	18,175	20,482	22,686	23,685
Other assets	4,936	5,341	5,018	6,047	5,774	7,274	7,529	7,439
Total assets	96,787	98,733	102,190	102,712	107,133	111,018	118,642	125,286
of which: foreign currency	24,789	24,346	24,157	22,455	22,376	22,178	24,328	24,591

Source: OeNB.

Table A27

Assets Held by Austrian Pension Funds

End of period, EUR million

	2001		2002		2003		2004	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31
Domestic securities	7,171	7,245	7,128	7,200	7,744	8,267	8,770	9,222
of which: federal treasury bills and notes	0	0	0	0	0	0	0	0
debt securities	35	63	67	57	56	45	121	151
mutual fund shares	7,127	7,163	7,032	7,125	7,641	8,159	8,607	9,019
other securities	9	19	30	18	47	63	42	52
Foreign securities	586	534	401	353	425	405	460	525
of which: debt securities	40	49	44	44	47	44	15	27
mutual fund shares	526	451	315	279	350	330	417	469
other securities	20	34	43	30	29	31	28	29
Deposits	92	164	118	171	164	221	72	125
Loans	69	39	32	42	67	42	59	83
Other assets	68	67	121	110	161	143	147	170
Total assets	7,986	8,049	7,800	7,876	8,562	9,078	9,508	10,125
of which: foreign currency	339	303	188	195	233	212	236	249

Source: OeNB.

Table A28

Assets Held by Austrian Severance Funds

End of period, EUR 1,000

	2003		2004	
	June 30	Dec. 31	June 30	Dec. 31
Total direct investment	6,293	38,531	64,938	92,254
of which: euro-denominated	6,260	38,164	63,993	89,227
foreign currency-denominated	0	0	0	x
accrued income claims from direct investment	33	367	945	x
Total indirect investment	12,073	59,460	123,526	269,842
of which: total of euro-denominated investment in mutual fund shares	11,794	59,187	122,845	266,594
total of foreign currency-denominated investment in mutual fund shares	x	x	x	3,248
Total assets assigned to investment groups	18,366	146,469	188,464	362,096
of which: foreign currency-denominated	x	x	x	4,930

Source: OeNB.

Note: Due to special balance sheet operations total assets assigned to investment groups deviate from the sum of total direct and total indirect investments.

NOTES

Abbreviations

ACH	automated clearing house	GNP	gross national product
APSS	Austrian Payment System Services GmbH	GSA	GELDSERVICE AUSTRIA Logistik für Wert- gestionierung und Transportkoordination GmbH (Austrian cash services company)
ARTIS	Austrian Real Time Interbank Settlement (the Austrian RTGS system)	HICP	Harmonized Index of Consumer Prices
A-SIT	Secure Information Technology Center – Austria	IBAN	International Bank Account Number
ASVG	Allgemeines Sozialversicherungsgesetz – General Social Security Act	IBRD	International Bank for Reconstruction and Development
A-Trust	A-Trust Gesellschaft für Sicherheitssysteme im elektronischen Datenverkehr GmbH	IDB	Inter-American Development Bank
ATM	automated teller machine	IFES	Institut für empirische Sozialforschung GesmbH (Institute for Empirical Social Research, Vienna)
ATX	Austrian Traded Index	ifo	ifo Institute for Economic Research, Munich
BCBS	Basel Committee on Banking Supervision (BIS)	IGC	Intergovernmental Conference (EU)
BIC	Bank Identifier Code	IHS	Institut für Höhere Studien und Wissenschaftliche Forschung – Institute for Advanced Studies, Vienna
BIS	Bank for International Settlements	IIF	Institute of International Finance
BOP	balance of payments	IIP	international investment position
BSC	Banking Supervision Committee (ESCB)	IMF	International Monetary Fund
CACs	collective action clauses	IRB	internal ratings-based
CEBS	Committee of European Banking Supervisors (EU)	ISO	International Organization for Standardization
CEE	Central and Eastern Europe	IWI	Industriewissenschaftliches Institut – Austrian Institute for Industrial Research
CEECs	Central and Eastern European countries	IT	information technology
CESR	Committee of European Securities Regulators	JVI	Joint Vienna Institute
CIS	Commonwealth of Independent States	LIBOR	London Interbank Offered Rate
CPI	consumer price index	M3	broad monetary aggregate M3
EBA	Euro Banking Association	MFI	monetary financial institution
EBRD	European Bank for Reconstruction and Development	MRO	main refinancing operation
EC	European Community	MÖAG	Münze Österreich AG – Austrian Mint
ECB	European Central Bank	MoU	memorandum of understanding
Ecofin	Council of Economic and Finance Ministers (EU)	NCB	national central bank
EEA	European Economic Area	ÖBB	Österreichische Bundesbahnen – Austrian Federal Railways
EFC	Economic and Financial Committee (EU)	OeBS	Oesterreichische Banknoten- und Sicherheitsdruck GmbH – Austrian Banknote and Security Printing Works
EIB	European Investment Bank	OECD	Organisation for Economic Co-operation and Development
EMS	European Monetary System	OeKB	Oesterreichische Kontrollbank (Austria's main financial and information service provider for the export industry and the capital market)
EMU	Economic and Monetary Union	OeNB	Oesterreichische Nationalbank (Austria's central bank)
EONIA	Euro OverNight Index Average	OPEC	Organization of the Petroleum Exporting Countries
ERM II	Exchange Rate Mechanism II (EU)	ORF	Österreichischer Rundfunk – Austrian Broadcasting Corporation
ERP	European Recovery Program	ÖBFA	Austrian Federal Financing Agency
ESA	European System of Accounts	ÖNACE	Austrian Statistical Classification of Economic Activities
ESAF	Enhanced Structural Adjustment Facility (IMF)	PE-ACH	pan-European automated clearing house
ESCB	European System of Central Banks	PISA	Programme for International Student Assessment (OECD)
ESRI	Economic and Social Research Institute	POS	point of sale
EU	European Union	PRGF	Poverty Reduction and Growth Facility (IMF)
EURIBOR	Euro Interbank Offered Rate	RTGS	Real-Time Gross Settlement
Eurostat	Statistical Office of the European Communities	SDR	Special Drawing Right (IMF)
FATF	Financial Action Task Force on Money Laundering	SDRM	Sovereign Debt Restructuring Mechanism (IMF)
Fed	Federal Reserve System	SEPA	Single Euro Payments Area
FFF	Forschungsförderungsfonds für die Gewerbliche Wirtschaft – Austrian Industrial Research Promotion Fund		
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		

SPF	Survey of Professional Forecasters	UNO	United Nations Organization
STEP2	Straight-Through Euro Processing system offered by the Euro Banking Association	VaR	Value at Risk
STP	straight-through processing	WBI	Wiener Börse Index
STUZZA	Studiengesellschaft für Zusammenarbeit im Zahlungsverkehr G.m.b.H. – Austrian Research Association for Payment Cooperation	WEF	World Economic Forum
S.W.I.F.T.	Society for Worldwide Interbank Financial Telecommunication	WIFO	Österreichisches Institut für Wirtschaftsforschung – Austrian Institute of Economic Research
TARGET	Trans-European Automated Real-time Gross settlement Express Transfer	WIIW	Wiener Institut für internationale Wirtschaftsvergleiche – The Vienna Institute for International Economic Studies
Treaty	refers to the Treaty establishing the European Community	WKO	Wirtschaftskammer Österreich – Austrian Federal Economic Chamber
UNCTAD	United Nations Conference on Trade and Development	WTO	World Trade Organization

Legend

- = The numerical value is zero
- .. = Data not available at the reporting date
- × = For technical reasons no data can be indicated
- 0 = A quantity which is smaller than half of the unit indicated
- ∅ = Mean value
- = New series

Note: Apparent arithmetical discrepancies in the tables are due to rounding.

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quarterly

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