



OESTERREICHISCHE NATIONALBANK  
EUROSYSTEM

# FINANCIAL STABILITY REPORT 22

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

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Editorial close: November 18, 2011

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

Financial stability means that the financial system – financial intermediaries, financial markets and financial infrastructures – is capable of ensuring the efficient allocation of financial resources and fulfilling its key macroeconomic functions even if financial imbalances and shocks occur. Under conditions of financial stability, economic agents have confidence in the banking system and have ready access to financial services, such as payments, lending, deposits and hedging.

# Reports

The reports were prepared jointly by the Foreign Research Division, the Economic Analysis Division and the Financial Markets Analysis and Surveillance Division, with contributions by Michael Andreasch, Christian Beer, Gernot Ebner, Maximilian Fandl, Martin Feldkircher, Andreas Greiner, Ulrich Gunter, Ingrid Haar-Stöhr, Stefan Kavan, Emanuel Kopp, Gerald Krenn, David Liebeg, Peter Lindner, Benjamin Neudorfer, Franz Pauer, Paul Ramskogler, Stefan Schmitz, Josef Schreiner, Ralph Spitzer, Eva Ubl, Karin Wagner and Walter Waschiczek..

# Developments in the Sovereign Debt Crisis Will Be Crucial for Financial Stability

The stability of the European financial system is increasingly threatened by the intensifying euro area government debt crisis and the ongoing indecision of policymakers in the EU. Doubts about the creditworthiness of Greece and other highly indebted countries again undermined trust in the banking sector as well as banks' trust in each other in 2011. While its exposure to those highly indebted euro area countries which are at the greatest risk is comparatively low, the Austrian banking system will not be able to emerge fully unscathed by the negative effects of the government debt crisis on business activity and refinancing.

## **The Oesterreichische Nationalbank Calls on Austrian Banks to Act**

In its Financial Stability Report of June 2011, the Oesterreichische Nationalbank (OeNB) pointed out that Austrian banks needed to take measures to strengthen business model sustainability and thus Austria's financial stability. Now that the need of banks to take measures appears more urgent than ever half a year down the line, the OeNB and the Financial Market Authority (FMA) have formulated a set of prudential measures for Austrian banks in Central, Eastern and Southeastern Europe (CESEE).

The package of measures devised by the OeNB and the FMA for Austrian banks operating in CESEE are meant to strengthen banking groups' capital adequacy and to improve CESEE subsidiary banks' refinancing options.

First, under Pillar 2 (the Supervisory Review Process) of Basel III, the three biggest banks are called on to implement the Basel III rules as soon as they take effect on January 1, 2013 (without

a transition period). Second, as from January 1, 2016, banks will be obligated to hold an additional common equity tier 1 ratio of up to 3%. Under Pillar 2, banks are also called on to link future credit growth to the growth of stable sources of refinancing (mainly local deposits). The refinancing of local lending of many CESEE subsidiary banks hinges on intragroup liquidity transfers and as a rule even increases during a crisis. In the past, countries with a high loan-to-deposit ratio were also those that had a greater credit risk. Against the backdrop of increasingly higher market expectations and the steady rise in the capital bases of comparable international banking groups, strengthening CESEE subsidiaries' refinancing structure, in order to render them less dependent, and parent companies' capital adequacy will help to secure the sustainability of the Austrian banks' business models.

The OeNB considers it important for Austrian banks to stop unhedged foreign currency lending and to successively strengthen current measures in CESEE as another key component of a sustainable business policy.

As Austrian banks exhibit very high foreign currency exposure in Austria and in CESEE, as exchange rate risk has recently materialized (the Swiss franc has appreciated against the euro and most CESEE currencies have depreciated against the euro), and as economic policymakers have taken unilateral measures, the restriction on new foreign currency lending in Austria and in CESEE agreed with banks has been set just in time. Banks operating in CESEE will also have to successively extend these restrictions to euro lending.

The OeNB considers it important for Austrian banks to reduce, in the medium term, existing structural weaknesses that affect profitability.

In the interest of the long-term sustainability of banks, addressing structural weaknesses is necessary not just to strengthen banks' capital bases, but also to wean them from their dependence on the comparatively high profits in their CESEE business – profits that come at the expense of high risks.

### **The Outlook for Economic Activity Deteriorates Markedly**

Euro area economic developments in the first half of 2011 were characterized by an upturn that was increasingly driven by services in addition to manufacturing. However, rising uncertainty about the sustainability of European – and U.S. – public finances have clouded the economic outlook in recent months.

By and large, the emerging markets have remained driving forces of global growth throughout the year 2011 so far. In the CESEE region, however, growth lost momentum in comparison with other emerging markets.

The powerful surge in commodity prices and expectations that inflation would accelerate in the medium term exerted marked upward pressures on prices. The ECB's target of keeping inflation rates of below, but close to, 2% will be missed this year.

International securities markets experienced unprecedented volatility in 2011. Most political stabilization measures only alleviated conditions temporarily. Against this background, most companies decided to postpone non-essential capital measures.

### **No Improvement in Austrian Companies' and Households' Risk Situation**

With global economic growth faltering and domestic demand in Austria weakening, the recovery of the Austrian economy came to a halt in mid-2011 after having posted robust growth in the first half of 2011. In the second quarter, corporate profits recovered to the precrisis level on the back of the strong economy. These higher profits for one thing boosted companies' capacity for internal financing, so that in the first half of 2011, companies required only a low volume of external financing. The share of bank lending in external financing growth stayed comparatively low, whereas the amount of funds raised in the form of bond issues was fairly high. For another thing, the improved profits in tandem with moderation in expanding corporate debt improved companies' debt-servicing capacity.

Moreover, lower interest rates on loans in the past two years relieved the cost burden for the corporate sector as well as for households. This development was additionally supported by the above-average share of variable rate loans. On a note of caution, though, such loans are fraught with substantial interest rate risk for companies and households. The continued high share of foreign currency loans in lending represents another risk factor for households. Although adjusted for exchange rate changes, the volume of foreign currency loans has fallen throughout the past two years, the share of such lending in total loans has decreased only little, given exchange rate developments in recent years, and still accounted for nearly 28.7% of all credits in the third quarter 2011.

Households' financial investment remained subdued in the first half of

2011. At the same time, price losses in international capital markets led to substantial (unrealized) valuation losses in securities portfolios and for insurance plan and pension fund investments.

### **Government Debt Crisis Has Negative Repercussions for Banking**

Since mid-2011, the uncertainties in the international capital markets have also had a negative impact on Austrian banks' stock price developments and refinancing options. Furthermore, Austrian banks' trading income was affected by valuation losses in several asset categories, which is why the positive development of the first half of 2011 cannot possibly continue and why earnings prospects for the rest of 2011 are bound to worsen.

The structural weaknesses affecting Austrian banks' domestic performance were, however, offset by the continued comparatively favorable performance in CESEE. In the first half of 2011, the operating profits of Austrian banks' subsidiaries, mainly interest income, rose marginally against the same period of the previous year. At the same time, credit risk provisions diminished, so

that semiannual profits were substantially higher than 2010 first-half profits. However, these figures did not yet reflect the most recent fiscal policy measures passed in individual countries or disruptions in the international financial markets in the second half of 2011. This environment, combined with the forecast decline in economic activity, had a negative impact on banking business in Austria and in CESEE in the second half of 2011. When total lending rose, foreign currency lending in CESEE also increased somewhat again. In Austria, though, supervisory action helped keep new lending in foreign currency at a very low level.

In the first half of 2011, the Austrian insurance sector faced a substantial fall in premiums. The higher return on investment the insurance sector had in the first half of 2011 came under pressure in the second half, as the sovereign debt crisis flared up once more. A longer period of low interest rates and low yields poses a considerable challenge for the Austrian insurance industry. The rise in synthetic Exchange-Traded Funds (ETFs) warrants a critical appraisal from the financial stability perspective.



# Deteriorating Outlook for the World Economy

## **Industrialized Countries: Slowdown in GDP Growth Expected for 2011 and 2012**

The outlook for the world economy is deteriorating. The IMF's World Economic Outlook (WEO) of September 2011 projects economic growth for 2011 and 2012 to slow in industrialized countries, following the recovery of the world economy in 2010. Compared with the June 2011 WEO, the September 2011 WEO revised real GDP growth for the U.S.A. down by 1.0 percentage point to 1.5% (2011) and by 0.9 percentage points to 1.8% (2012). For the euro area, the IMF downgraded its growth forecast by 0.4 percentage points to 1.6% (2011) and by 0.6 percentage points to 1.1% (2012). For industrialized countries as a whole, the IMF projects real GDP growth of only 1.6% (2011) and 1.9% (2012). Compared with the June 2011 WEO, this is equivalent to a downward revision of 0.6 (2011) and 0.7 percentage points (2012). A portion of the lower-than-average growth in industrialized countries will be offset by continued robust economic momentum in emerging markets and developing countries, which have so far largely escaped the current crisis. With projected GDP growth of 9.5% (2011) and 9.0% (2012), China remains the engine of world economic growth. Slowing growth in industrialized countries is connected e.g. with the earthquake in Japan, which had a negative impact on global supply chains. Other determinants are the end of government stimulus programs, the need for household and public sector deleveraging, the decline in real disposable income due to high commodity prices, as well as the banking sector's reluctance to lend. Emerging market growth, which is still

robust albeit slowing, is primarily attributable to four factors: anticyclical economic policy measures, the recovery of commodity prices since mid-2009, the increase in real wages and the fact that banks in less developed countries were hardly affected by the international financial crisis and were able to extend credit without constraints. Growth in emerging markets and developing countries is also increasingly attributable to the expansion of their domestic markets, which means they are becoming less dependent on industrialized countries' economic development.

Owing to the deteriorating outlook for global GDP growth and the continuing debt problems of some peripheral countries in the euro area, downside risks to economic development currently prevail in the euro area. Risks to economic recovery are currently arising from both the financial and banking system. These risks are fueled by the sovereign debt crisis in Europe and the still unstable situation in the housing market in the U.S.A. The risks to emerging markets are caused by the fact that the worsening debt crisis in Europe and the U.S.A. is heightening the risk aversion of investors; the latter are siphoning away money, which is putting downward pressure on emerging market currencies. Compared with the highly indebted Western industrialized countries, however, emerging markets have a considerably larger scope in their monetary and budgetary policies to curb the depreciation of their currencies and to prevent a steep slump in growth.

Since the September 2011 WEO was published, the outlook for the world economy has further deteriorated – particularly, in industrialized

countries. This picture is also evident in the European Commission's fall 2011 economic forecast released in mid-November, which sharply downgraded the growth outlook for industrialized countries. The IMF is therefore also expected to make further downward adjustments to its outlook for industrialized countries in the near future.

Housing market situation still problematic

In the U.S.A., the results of the latest major revision of GDP data reveal that the cumulated slump in growth during the 2008/09 recession was significantly higher than shown in the original calculations. Also, the recovery of the U.S. economy in the first half of 2011 was weaker than previously assumed. At +0.4% (quarter on quarter, on an annualized basis) in the first quarter of 2011 and at +1.3% in the second quarter of 2011, GDP growth proved to be unexpectedly sluggish. With growth of 2.0%, economic momentum in the third quarter of 2011 was slower than initially assumed. Growth in the third quarter of 2011 was fueled primarily by an increase in private consumption, corporate investment and exports. Leading economic indicators currently suggest that the economy will grow modestly in the fourth quarter of 2011.

Slowing U.S. economic recovery in the first half of 2011, stronger momentum in the third quarter

Rating agency S&P downgraded U.S. long-term credit rating from AAA to AA+ with a negative outlook in early August 2011

Situation in U.S. labor market remains tight

The U.S. jobless rate only fell by 1 percentage point or so from its high of 10.1% (October 2009) and recently climbed back sharply to 9.7% (October 2011). In a bid to revive the labor market, on September 8, 2011, President Obama proposed a new economic rescue package, which will largely take effect in 2012. Core components of this package are extending the payroll tax cut for workers and jobless benefits for the unemployed, as well as offering tax incentives to employers who create new jobs. A bipartisan congressional committee has been set up to ensure the counterfinancing of these measures.

U.S. Fed keeps target federal funds rate unchanged but approves further unconventional measures

The approval of this package by the Republicans remains uncertain, however. The IMF endorses Obama's plan to stimulate the economy in the short term and to shore up the government budget in the medium term only.

The situation in the U.S. housing market remains difficult. As in previous months, housing estate prices (based on the S&P/Case-Shiller Homes Price Index) remained unchanged in August 2011. The coming months will continue to see downside risks primarily arising from the low number of house sales, the still high number of foreclosures, stringent mortgage lending conditions and falling disposable income.

On August 5, 2011, rating agency Standard & Poor's (S&P) – for the first time in the country's history – downgraded its long-term credit rating for the U.S.A. by one notch from AAA to AA+ with a negative outlook. S&P justified its decision by citing the worryingly high budget deficit, the inadequate cost saving plans and the confidence-shaking political feud relating to the raising of the U.S. debt ceiling, which will also impede budget consolidation measures in future. In the days following the U.S. credit rating downgrade, the sale of U.S. government bonds rose surprisingly. This development is likely to be connected with growing uncertainties in other bond market segments at this time and with the shift from stocks into bonds. U.S. government bonds are clearly still seen as a safe haven in uncertain times – especially since Moody's and Fitch, the two other major rating agencies, still award the U.S. their top AAA credit rating.

Fueled by higher energy and food prices, the annual CPI inflation rate stood at 3.5% in October 2011. Core inflation, which has been trending up

Table 1

**IMF and WIFO Economic Outlook: Industrialized Countries**

	Real GDP				CPI				Current account			
	2009	2010	2011 <sup>1</sup>	2012 <sup>1</sup>	2009	2010	2011 <sup>1</sup>	2012 <sup>1</sup>	2009	2010	2011 <sup>1</sup>	2012 <sup>1</sup>
	Annual change, %				Annual change, %				% of GDP			
<b>Industrialized countries</b>	<b>-3.7</b>	<b>3.1</b>	<b>1.6</b>	<b>1.9</b>	<b>0.1</b>	<b>1.6</b>	<b>2.6</b>	<b>1.4</b>	<b>-0.2</b>	<b>-0.2</b>	<b>-0.3</b>	<b>0.1</b>
<b>U.S.A.</b>	<b>-3.5</b>	<b>3.0</b>	<b>1.5</b>	<b>1.8</b>	<b>-0.3</b>	<b>1.6</b>	<b>3.0</b>	<b>1.2</b>	<b>-2.7</b>	<b>-3.2</b>	<b>-3.1</b>	<b>-2.1</b>
<b>Euro area</b>	<b>-4.3</b>	<b>1.8</b>	<b>1.6</b>	<b>1.1</b>	<b>0.3</b>	<b>1.6</b>	<b>2.5</b>	<b>1.5</b>	<b>0.1</b>	<b>0.3</b>	<b>0.1</b>	<b>0.4</b>
Germany	-5.1	3.6	2.7	1.3	0.2	1.2	2.2	1.3	5.6	5.7	5.0	4.9
France	-2.6	1.4	1.7	1.4	0.1	1.7	2.1	1.4	-1.5	-1.7	-2.7	-2.5
Italy	-5.2	1.3	0.6	0.3	0.8	1.6	2.6	1.6	-2.1	-3.3	-3.5	-3.0
Spain	-3.7	-0.1	0.8	1.1	-0.2	2.0	2.9	1.5	-5.2	-4.6	-3.8	-3.1
Austria	-3.9	2.1	3.3	1.6	0.4	1.7	3.2	2.2	3.1	2.7	2.8	2.7
Austria (WIFO)	-3.8	2.3	2.9	0.8	0.4	1.7	3.5	2.3	3.1	2.7	2.8	2.8
<b>United Kingdom</b>	<b>-4.9</b>	<b>1.4</b>	<b>1.1</b>	<b>1.6</b>	<b>2.1</b>	<b>3.3</b>	<b>4.5</b>	<b>2.4</b>	<b>-1.7</b>	<b>-3.2</b>	<b>-2.7</b>	<b>-2.3</b>
<b>Japan</b>	<b>-6.3</b>	<b>4.0</b>	<b>-0.5</b>	<b>2.3</b>	<b>-1.4</b>	<b>-0.7</b>	<b>-0.4</b>	<b>-0.5</b>	<b>2.8</b>	<b>3.6</b>	<b>2.5</b>	<b>2.8</b>

Source: IMF (World Economic Outlook, September 2011). Austria (WIFO): WIFO forecast (September 2011).

<sup>1</sup> Forecast.

since early 2011, was recently 2.1%. The U.S. Fed nevertheless maintained the target federal funds rate at a range of 0–0.25%, i.e. unchanged for almost three years now. In a bid to support the economy, the Fed announced, already in August 2011, that it would continue its zero interest policy to at least mid-2013. Since the U.S. Fed has now largely exhausted the conventional instruments at its disposal, it is now employing this unusual arrangement in an attempt to influence expectations.

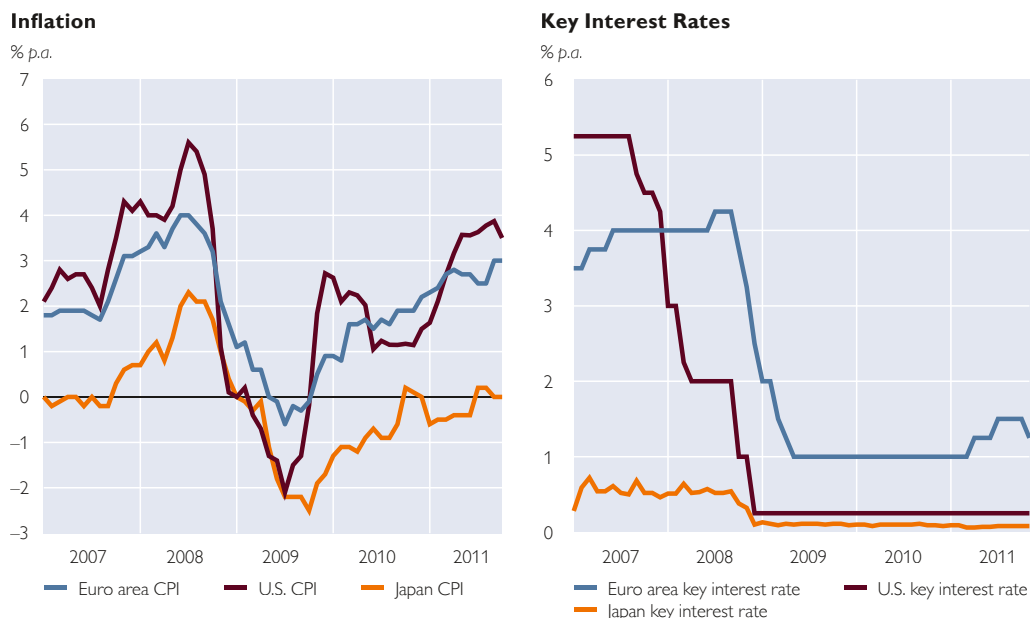
In September 2011, the Fed approved a further unconventional measure. It will purchase long-term bonds worth USD 400 billion until end-June 2012 and simultaneously sell short-term bonds of the same value in order to keep the Fed's balance sheets unchanged. This measure first trialed in the 1960s under the designation "Operation Twist" aims to lower long-term interest rates.

In the euro area, real GDP growth slowed markedly during the first half of 2011. After quarterly growth of 0.8% in the first quarter of 2011, economic output expanded by only 0.2% in the

second quarter of 2011. Compared with the second quarter of 2010, growth stood at 1.6%. The contraction was generally expected, as the first quarter of 2011 was strongly marked by catching-up and backlog effects following a severe winter. Private consumption was down on the previous quarter, which the development in retail sales had already signaled. This is attributable to two sets of factors: first, the need for household and public sector deleveraging, as well as the decline in real disposable income due to high commodity prices. Second, uncertainty about the debt crisis in some peripheral countries of the euro area is also likely to have adversely affected the propensity to consume. External trade made the largest contribution to growth in the second quarter of 2011. In Germany, GDP growth slumped particularly sharply to 0.1% in the second quarter of 2011 (first quarter of 2011: 1.3%). Although external trade gained momentum with both imports and exports up, the rise in imports exceeded that in exports. As a result, external trade made a visibly negative contribu-

After a strong first quarter, euro area GDP growth slumps in the second quarter of 2011

## Euro Area, U.S.A., Japan: Inflation and Key Interest Rates



Source: Eurostat, ECB.

tion to growth, which dampened the momentum of the German economy. In other major euro area countries, growth also proved to be sluggish in the second quarter of 2011. France registered zero growth (first quarter of 2011: +0.9%), and neither Italy (+0.3%) nor Spain (+0.2%) expanded much. Growth is likely to have remained sluggish in the third quarter of 2011. According to a Eurostat flash estimate, it was 0.2% in this period. The fourth quarter of 2011 is also likely to have seen continued sluggish growth.

#### ECB cuts key interest rate in November 2011

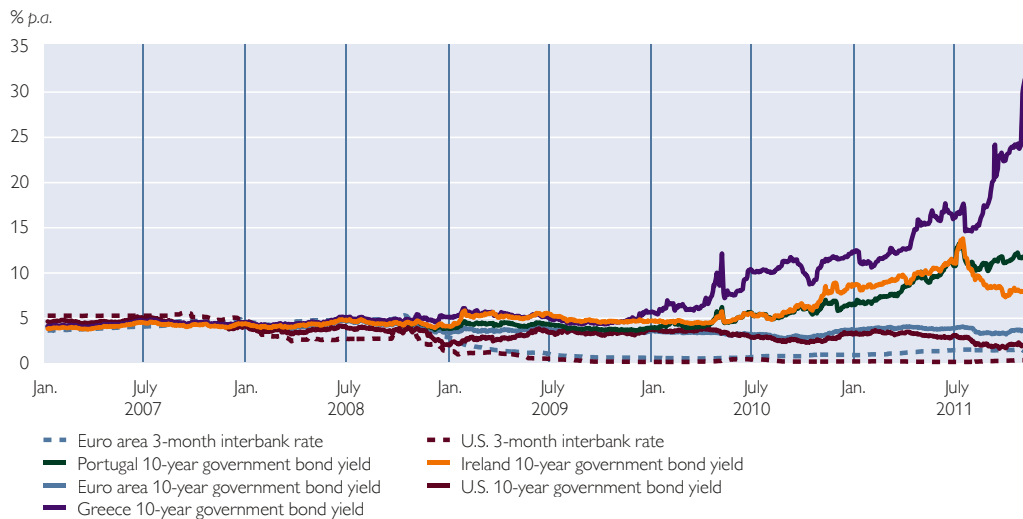
At its meeting in early November 2011, the Governing Council of the ECB decided to cut its key interest rate by 25 basis points, as strains in the financial markets are likely to dampen both GDP growth and inflation in the euro area in the second half of 2011 and beyond. Since November 3, 2011, therefore, the key interest rate has stood at 1.25%. To meet banks' increased need for liquidity, for the time being all tenders are being processed

with full allotment. As at the height of the economic and financial crisis, banks used the deposit facility to deposit with the ECB a growing portion of the liquidity thus allotted. This behavior is a sign of increased mistrust between banks as well as refinancing difficulties in the interbank market. In early October 2011, the Governing Council of the ECB also decided to recommence the covered bond purchase program, which was already used in 2008. Under this program, mortgage bonds (Pfandbriefe) totaling EUR 40 billion should be purchased in the period from November 2011 to October 2012. Owing to high surplus liquidity, the Euro Overnight Index Average (EONIA) remained relatively stable for a long time at around 1%. However, after the key interest rate was cut in early November 2011, it fell to 0.7%.

In the U.S. money market, LIBOR interest rates have been relatively stable since fall 2009. In the euro area money market, however, EURIBOR interest

Chart 2

### Euro Area and U.S.A.: 3-Month Money Market Rates and 10-Year Government Bond Yields



Source: Thomson Reuters.

rates have been rising slightly since early 2011. In the U.S. money market, risk premiums remained below those in the euro area.

Discussions about Greece's solvency caused risk premiums on Greek bonds to soar until mid-July 2011, with spill-over effects on Irish and Portuguese government bond yields. Following an extraordinary summit of the European Council on July 21, 2011, which approved a comprehensive stabilization package (second Greek package), greater flexibility of the EFSF and the ESM<sup>1</sup>), yield spreads between Greek, Portuguese and Irish government bonds, on the one hand, and German Bunds, on the other, narrowed considerably. In August 2011, the debate about the guarantees demanded by the Finnish government for Finland to participate in the euro rescue fund, as well as the package's tentative implementation in the national parlia-

ments, triggered further steep increases in risk premiums.

Finally, the steadily deteriorating growth outlook, together with overall very low sales, resulted in new record premiums on Greek government bonds. It is worth noting the increasing decoupling of this development in risk premiums on Greek government bonds, on the one hand, and the risk premiums on Portuguese and Irish government bonds, on the other. After public attention had increasingly focused on Spain's and, especially, Italy's budgeting, political intervention was necessary for long-term stabilization. The measures agreed by European leaders at the EU summit of October 26, 2011, consist of a voluntary debt haircut of 50% for Greece, a substantial increase of the funds of the EFSF (without increasing its total guarantee commitments), and bank recapitalization measures.

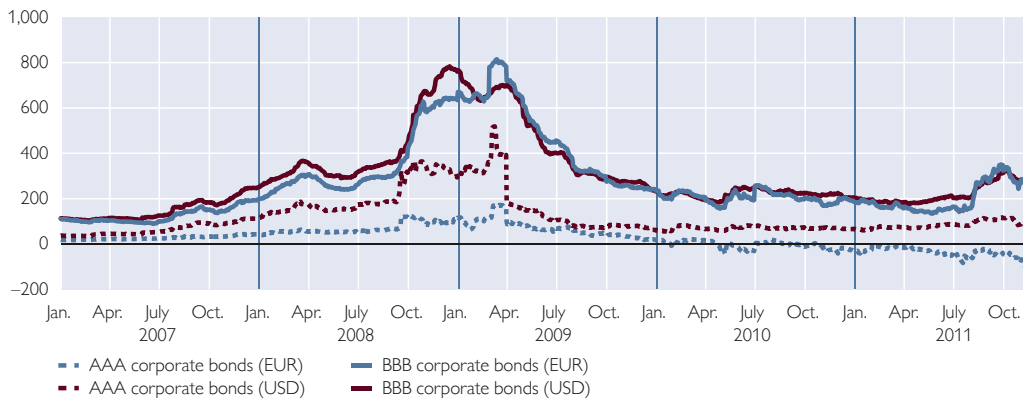
Continued turmoil in government bond markets – EU summit of October 26, 2011: agreement on voluntary Greek debt haircut of 50%

<sup>1</sup> EFSF: European Financial Stability Facility; ESM: European Stability Mechanism.

Chart 3

### Euro Area and U.S.A.: Spreads of 7-Year to 10-Year AAA and BBB Corporate Bonds against Government Bonds

Basis points; against government bonds (U.S. and euro area average)



Source: Thomson Reuters, OeNB.

#### Rising corporate bond premiums

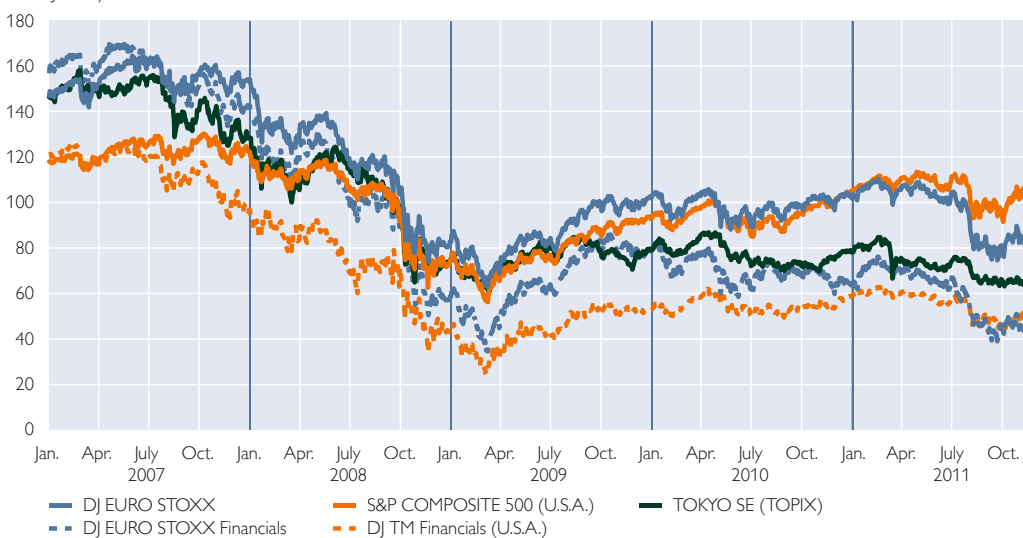
Renewed flare-ups in the debate on sovereign debt in the euro area and protracted discussions in the U.S.A. about raising the debt ceiling also had a detrimental impact on the financing costs of companies, which are currently financing themselves in the bond market more dearly, compared with a few months ago. The yield spreads for BBB-rated corporate bonds in the euro area

and the U.S.A. have widened sharply since August 2011. For AAA-rated bonds, the rise in yield spreads was significantly smaller in the U.S.A. In the euro area, yield spreads for such bonds even experienced a slight narrowing. The spreads for AAA-rated corporate bonds in the euro area were generally at a lower level than those in the U.S.A.

Chart 4

### Euro Area, U.S.A, Japan: Stock Market Indices and Subindices for Financial Institution Stocks

Index: January 1, 2005 = 100



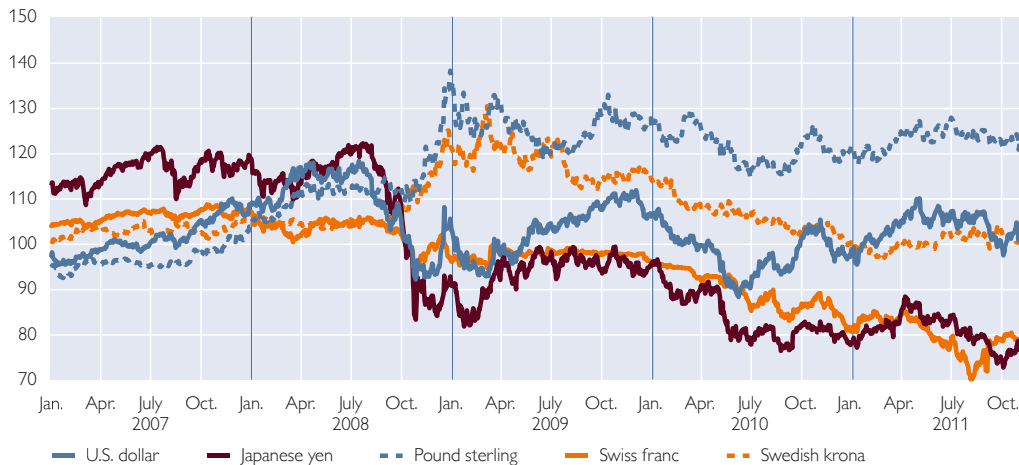
Source: Thomson Reuters, OeNB.



Chart 5

### Industrialized Countries: Exchange Rates Against the Euro

Index: January 1, 2005 = 100 (upward movement = euro appreciation)



Source: Thomson Reuters, OeNB.

Note: National currency per euro unit.

Since reaching an annual high in February 2011, the Dow Jones EURO STOXX has lost about 25% of its value and now stands only just above its crisis-induced low of spring 2009. Most of these losses were recorded after July 21, 2011, i.e. following the EU special summit. European bank stocks suffered most, having lost some 45% of their value since their annual high in February 2011 (and some 30% since the EU special summit).

The same trends are evident in U.S. equity markets: Since February 2011, major U.S. banks have suffered price losses of about 40%, although the all-items index of large U.S. companies has merely lost 7% or so of its value.

Recent fluctuations in the EUR/USD exchange rate were closely connected with developments in the European debt crisis. The decisions taken at the EU Summit on October 26, 2011, had triggered a rally on the markets. European equity indices generated the largest weekly gains since 2009, with the EUR/USD exchange rate rising temporarily above USD 1.42 per euro for the first time since September 6,

2011. The EUR/USD exchange rate, however, has since fallen to below USD 1.35 per euro.

On September 6, 2011, the Swiss National Bank (SNB) set the minimum exchange rate at CHF 1.20 per euro, as its monetary policy measures designed to weaken the Swiss franc had not had a lasting effect. As a result of this measure, the Swiss currency softened markedly. The SNB justified its action by explaining that in particular exports and tourism were suffering from the strong currency.

### CESEE Compared with Other Emerging Markets

According to the latest IMF estimates of September 2011, the world economy will grow by 4% in 2011 (2010: 5.1%). Compared with April 2011, the IMF has downgraded its world GDP growth forecast for 2011 by 0.4 percentage points, primarily owing to slower economic momentum in developed countries (e.g. U.S.A., Japan). For emerging markets as a whole, however, the growth outlook was confirmed at some +6.5%. At +8.2% – primarily owing

The SNB sets exchange rate target

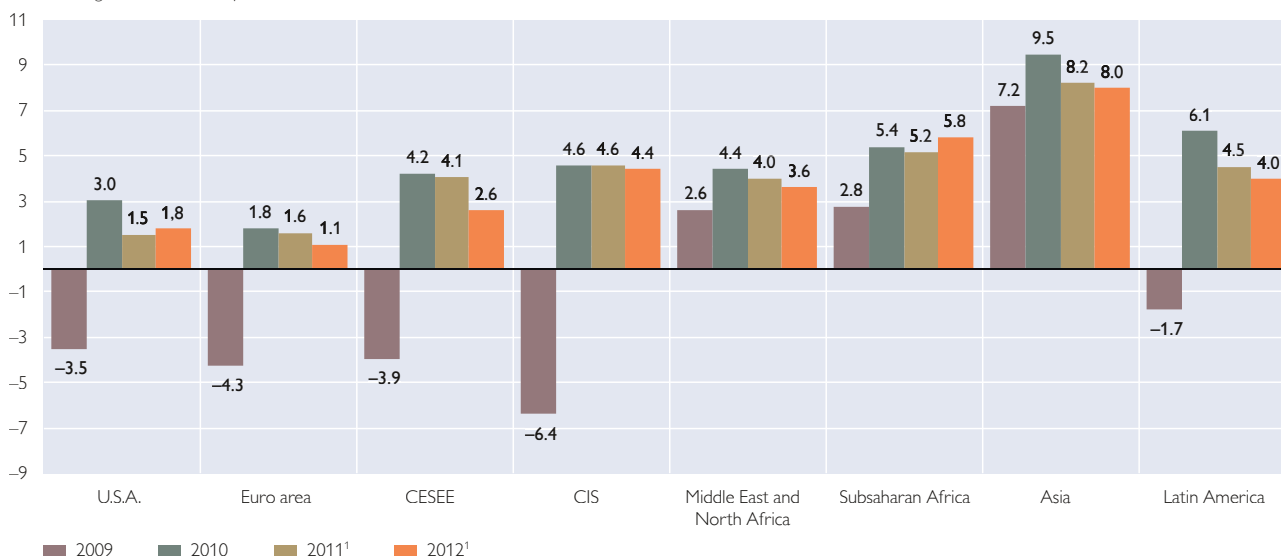
Further equity market losses – particularly sharp deterioration in financial stocks

Modest slowdown in emerging markets' GDP growth

High volatility of EUR/USD exchange rate due to developments in euro area peripheral countries

## Emerging Markets and Selected Industrialized Countries: GDP Forecast

Annual change in % at constant prices



Source: IMF (World Economic Outlook), September 2011

<sup>1</sup> IMF forecast.

Note: CESEE excluding European CIS countries; Asia excluding (newly) industrialized countries; Latin America including Caribbean countries.

to still favorable GDP growth in China and India – Asia will generate the fastest growth among emerging market regions, which means it will remain the engine of global economic growth in 2011. For Central, Eastern and South-eastern Europe (CESEE), the IMF projects GDP growth of +4.1%, owing to still high growth momentum in Turkey. However, this figure is below the growth rates forecast for other emerging market regions such as Latin America, Subsaharan Africa and the CIS. The Middle East and North Africa region, which has been badly affected by social unrest and military conflict, will be the only emerging market region to grow more slowly than CESEE, albeit only marginally so.

For 2012, the IMF again projected world GDP growth of 4%. This figure is half a percentage point lower than that predicted in spring 2011, with significantly increased downside risks owing to the tight global financial situ-

ation and uncertainties about fiscal policy in developed countries, among other factors. In 2012, GDP growth will slow marginally in emerging markets as a whole owing to more sluggish export demand from developed countries and to increasingly restrictive economic policies in many emerging markets. Compared with 2011, every emerging market region – except for Subsaharan Africa – will suffer a more or less pronounced slowdown of growth. For emerging market regions as a whole, however, the growth outlook still remains relatively favorable at +6.1%. The pace of growth will, however, sharply diverge between and within these regions also in 2012. With projected GDP growth of +8%, Asia maintains its lead, followed by Subsaharan Africa (almost +6%). The CIS, Middle East and North Africa regions will advance more or less in line with the world economy. Owing to a sharp slump in growth in Turkey and the



deteriorating Western European economy, CESEE will expand at a slower than average pace (projected GDP growth: + 2.6%), compared with emerging markets and the world economy.

In the light of soaring energy and food prices, global inflationary pressures visibly rose in the first half of 2011. This phenomenon applies all the more to emerging markets, as energy and food have a higher weight in the baskets of goods belonging to countries with lower per-capita income. In certain rapidly growing countries (e.g. China, India), however, demand-side factors also fueled consumer price inflation. Although inflation seems to have largely peaked in summer 2011, average annual inflation in emerging markets as a whole will climb to 7.5%, which is 1.4 percentage points higher than in 2010 and 0.6 percentage points higher than expected in the spring 2011 WEO. In the CIS, Middle East, North Africa and Subsaharan Africa regions, consumer price inflation exceeds this figure while, in Asia, Latin America and CESEE, it is below this value. To

counter inflationary pressures, many emerging markets tightened their monetary policies by raising key interest rates and increasing minimum reserve requirements in the first half of 2011 and/or allowed their currencies to appreciate. According to the IMF, restrictive monetary policy stimuli, together with slowing global economic momentum and a slight easing in commodity markets in 2012, will result in a drop in inflation particularly in the Middle East, North Africa and Asia. Of the emerging market regions, CESEE is expected to have the most favorable inflationary environment (4.2%).

As in the previous year, the IMF expects external imbalances to increase in most emerging market regions in 2011. Although the current account surplus in Asia is expected to remain at its 2010 level, considerably higher surpluses are anticipated in the CIS, the Middle East and in North Africa (despite partially disrupted production in some countries), owing to persistently high commodity prices. For the same reason, after disclosing a deficit in 2010, the cumulated current account

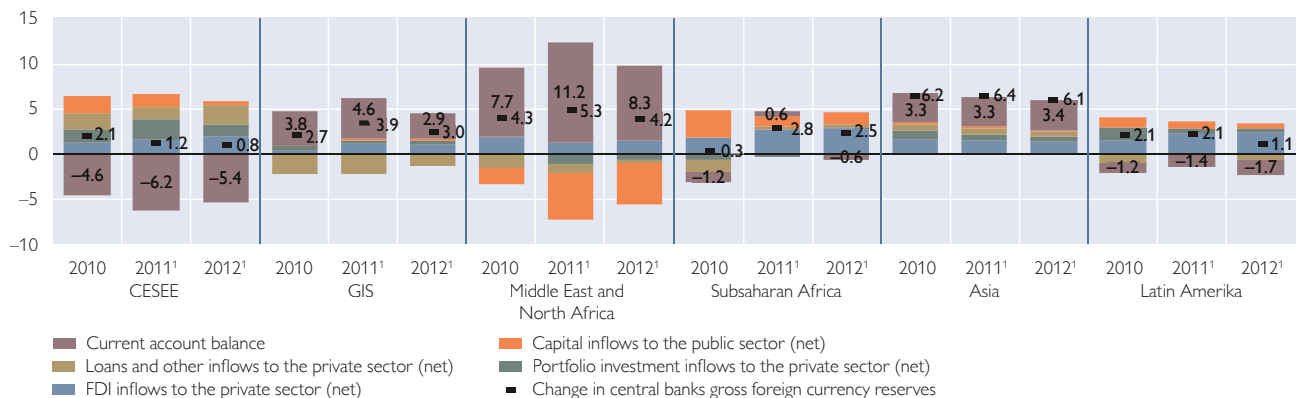
Energy and food prices drive up inflation

External imbalances will continue to increase

Chart 7

### Emerging Markets: Current Account Balances and Net Capital Inflows

% of GDP (at exchange rate)



Source: IMF, OeNB.

<sup>1</sup> IMF forecast.

Note: Negative net capital inflows (to the public sector) refer to net capital outflows from the public sector (to industrialized countries). Positive values for the change in official gross reserves indicate an increase. CESEE excluding European CIS countries, the Czech Republic, Slovakia and Slovenia; Asia excluding South Korea, Taiwan, Hong Kong and Singapore.

of the Sub-Saharan Africa region will show a surplus in 2011. At the same time, the current account deficit in CESEE and Latin America is increasing more or less steeply.

For 2012, the IMF anticipates a reduction in current account surpluses in commodity-exporting countries and regions due to slowing global growth and lower oil prices. For CESEE, the IMF forecasts a modest deterioration in the external positions of almost every country in the region owing to the EU's expected economic downturn, accompanied by lower export demand of CESEE's key trading partners (e.g. Germany, Italy). Within the CESEE region, the IMF expects a marked improvement only in Turkey's current account balance, which is connected with the projected slowdown of growth in 2012.

At some 2.3% of GDP, net capital inflow to the private sector in emerging markets as a whole is likely to be as high in 2011 and 2012 as in 2010, according to the IMF. In 2011, every emerging market should see robust positive net capital inflow to the private sector – except for the CIS, Middle East and North Africa regions, which were faced with capital outflows owing to high current account surpluses and geopolitical uncertainties. In Latin America, above all, capital inflows to the private sector increased particularly steeply owing to rapid growth momentum and rising commodity prices. In CESEE too, the private sector will attract more capital inflows in 2011, although they will remain well below their precrisis levels.

With a share of some three-fourths of total private capital inflow to emerging markets, foreign direct investment (FDI) is the most important form of capital. Compared with the previous year, its share in total capital inflow has

been increasing steeply to the detriment of portfolio investment in 2011. This development can be seen as a certain normalization following the relatively robust flow of portfolio investment especially to Latin America, Asia and some CESEE countries in 2009 and 2010. In addition, the decline in portfolio investment can be seen as a sign of growing risk aversion due to the re-emerging uncertainties in global financial markets. FDI fully covered the aggregate current account deficit in Latin America while, in CESEE, it financed almost a third of the current account deficit on average.

At  $-0.1\%$  of GDP, capital flow to the public sector was marginally negative in emerging markets taken as a whole, although net capital inflow to the public sector was positive in almost every region. These inflows were however offset by vigorous capital outflow from the public sector in the Middle East and North Africa. Last but not least, owing to high and growing current account surpluses and despite increased foreign currency market interventions in support of some emerging markets' national currencies in early fall 2011, foreign currency reserves in all emerging market regions will continue to accumulate in 2011, according to the IMF.

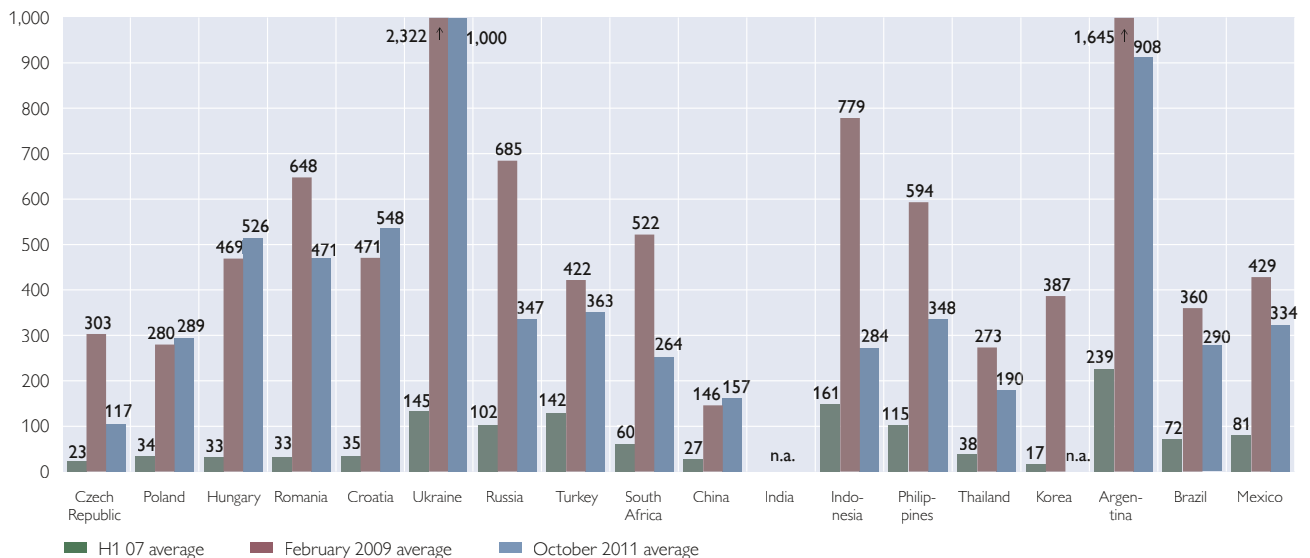
Since May 2011 – and even more since early August 2011 – key financial indicators (equity, government bond and CDS markets) in emerging markets have been showing a negative trend in line with developments in industrialized countries. Key factors behind this phenomenon are, in particular, increasingly jittery global financial markets owing to the European debt crisis and the deteriorating global outlook for GDP growth. However, partial capital withdrawals from emerging market equity funds designed to safeguard

High capital inflow poses challenge to some emerging markets

Global uncertainties also weigh emerging financial markets down

## Emerging Markets: Spreads of Government Bonds Issued Abroad in Foreign Currency

J.P. Morgan Euro Emerging Market Bond Index, Euro EMBI spread, level in basis points



Source: Bloomberg, Thomson Reuters, OeNB.

Note: Spreads refer to yield differentials vis-à-vis euro area government bonds of the same maturity. For Russia, Indonesia and Argentina: (USD-based) EMBI and U.S. government bonds; for the Czech Republic, Korea and Thailand: 5-year government CDS premiums serve as a proxy.

liquidity and increasing economic risks of overheating in certain emerging markets are also likely to have strengthened this development recently. For instance, the MSCI Emerging Markets Price Index has lost around 14.3% of its value since May 2011. The subindices for Central and Eastern Europe (MSCI EM Europe) and Asia (MSCI EM Asia) have lost some 17% since May 2011, while the MSCI EM Latin America Index registered a more moderate loss of some 10%. Of the equity indices in CESEE and CIS countries that are not included in the MSCI EM Europe, most have recorded far more considerable losses than the benchmark.

Owing to growing uncertainty and the related increased risk aversion on global financial markets, Eurobond spreads have been largely trending up – especially since late summer 2011. For most of the countries under review, the spreads are still well below the levels reached when the financial crisis

peaked in spring 2009 – for some countries, however, e. g. Poland, Hungary and Croatia, the spreads have exceeded their previous records by a slight margin. The same also goes for other emerging markets and/or regions. Especially in the Middle East and North Africa regions, social unrest was accompanied by foreign investor uncertainty and hence rising risk premiums and falling stock market prices.

### CESEE: Economic Recovery Slows

Uncertainties about future economic development in CESEE countries have increased considerably in recent months. After growth in the first quarter of 2011 had accelerated slightly and the economy had expanded by a regional average of 3.7% (year on year), signs indicating a cooling off in the economy have been proliferating since early summer. For instance, several high frequency, leading and confidence indicators for CESEE countries have

### Weaker growth in the second quarter of 2011

deteriorated recently. This situation applies to industry, in particular. Since early 2011, growth in industrial production has halved from some 8.5% to most recently (September 2011) some 5% (year on year), and confidence indicators have deteriorated significantly. The decisive factor was primarily the slowdown in international demand momentum.

This development was also reflected in the numbers for the second quarter of 2011. GDP growth slowed in most of the countries under review. Hungary, Slovenia, Romania, the Czech Republic and Russia registered seasonally and working day-adjusted growth rates ranging between only 0.0% and 0.2% on a quarterly basis. Owing to the sharp slowdown in year-on-year non-seasonally-adjusted growth, Ukraine is also expected to fall into this group of countries (adjusted GDP data are not currently available for Ukraine). Continued robust growth in Poland, how-

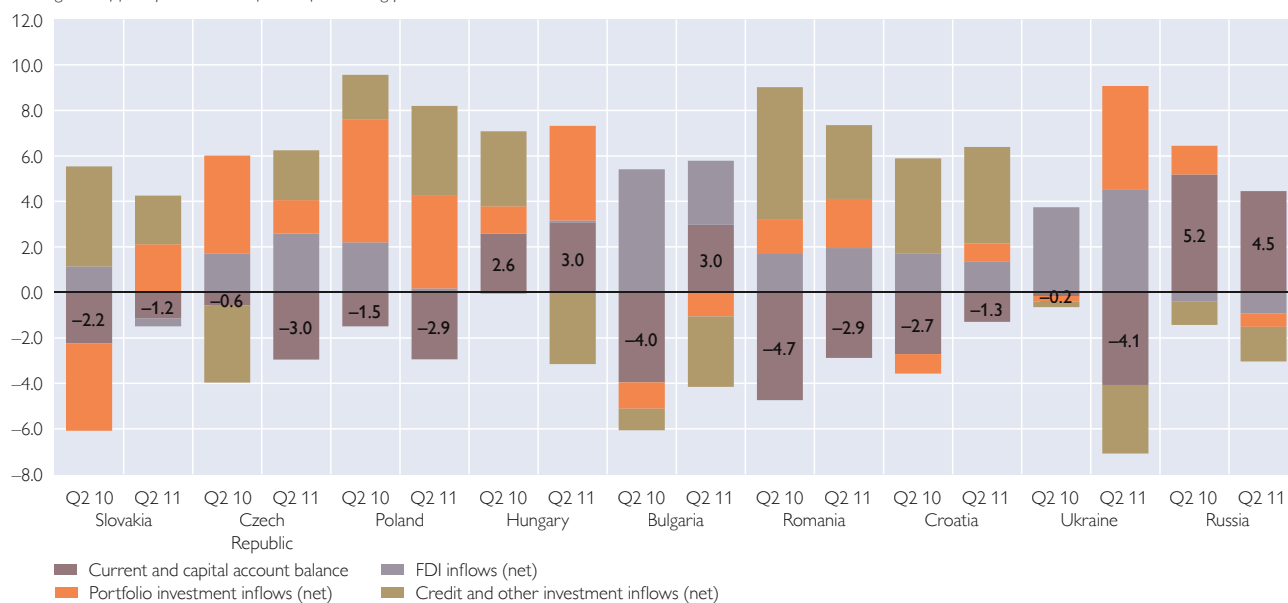
ever, had a favorable impact on the region as a whole (+1.1% on the previous quarter).

Although slackening international demand in the second quarter of 2011 was already reflected in lower export growth, the external economy remained a key pillar for growth in most EU Member States of this region and in Croatia. However, a visibly negative contribution to growth by net exports had a dampening effect on economic momentum in Russia and Ukraine. In some countries, a trend toward stronger domestic demand was observed. This applies primarily to Poland, Ukraine and Russia, where both private consumption and investment made a significant contribution to growth. Recently, a certain pick-up in investment activity was also observed in the Czech Republic and Slovakia. The reason is likely to be found, above all, in the pent-up need for investment after several quarters of falling investment

Chart 9

## Current and Capital Account Balance and Its Financing

Moving sum of four quarters in % of GDP of this rolling period



Source: Eurostat, national central banks, OeNB.

spending during the crisis. However, Hungary, Romania and Bulgaria – the slowest growing countries of the region – still reported wholly negative contributions to growth from domestic demand. In these countries, growth remains constrained by a greater need for public sector consolidation, continuing household deleveraging and a faltering construction sector.

The international climate continued to deteriorate from August 2011 (further loss in confidence levels, increased volatility and risk aversion in international financial markets, continuing sovereign debt crisis in some euro area countries and – against this background – doubts about the stability of the European banking system). In view of the close economic and financial ties between CESEE countries and Western European economies, GDP growth of the region under review is expected to slow markedly to a range between some 2% and 2.5% in 2012, which still signifies a fairly large edge over Western Europe in growth terms.

The international financial crisis resulted in a marked reduction in external imbalances in CESEE. This trend persisted in many countries of the region (e.g. in Slovakia, Bulgaria, Romania and Croatia) in the first half of 2011. In Poland, Ukraine and the Czech Republic, however, a slight increase in current account deficits could already be detected again. In the first two countries this development is primarily explicable by strong domestic demand and the related growing trade balance deficit, while in the Czech Republic it was due to the deepening income account deficit. Companies under foreign ownership chalked up profits, of which a proportion was distributed to their parent companies.<sup>2</sup>

In almost all the countries under review, the financial account was positive for the sum of the four quarters to mid-2011. It was slightly in the red only in Russia and Bulgaria (both countries, however, show a current account surplus). In Bulgaria and the Czech Republic, the largest positive component of the financial account was (net) FDI; in Slovakia, Hungary, Poland and Ukraine, it was (net) portfolio investment, and in Romania and Croatia other investment (net; especially loans) predominated. In Russia, capital outflows from all three categories were reported during the reporting period. Net FDI inflows covered the total combined current and capital account deficit only in Croatia and Ukraine.

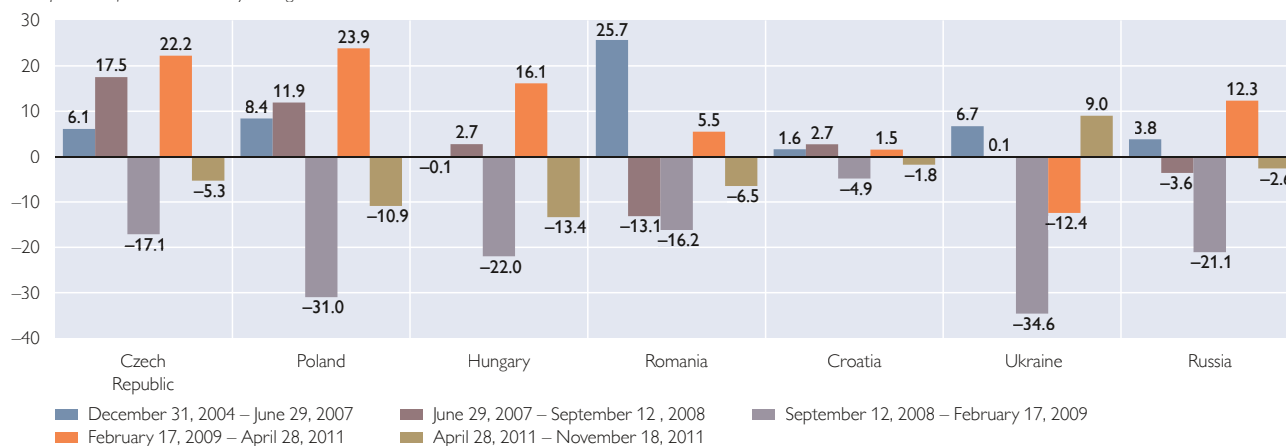
IMF/EU as well as IMF stabilization programs remain in force in Romania and Ukraine. In Romania, a precautionary stand-by arrangement for the IMF program that is coming to an end was concluded in March 2011. This arrangement comprises funds equaling around EUR 3.6 billion. The EU (EUR 1.4 billion) and the World Bank (EUR 0.4 billion) also contributed to this package. Romania has so far not used any of the three IMF tranches available (totaling EUR 1 billion) and has confirmed that it does not intend to do so in future. As for Ukraine, an IMF stabilization program (totaling EUR 11.6 billion), through which two tranches totaling EUR 2.6 billion have already been disbursed, has been in force in the country since summer 2010. Since spring 2011, however, the program has been suspended, as the Ukrainian authorities have been dilatory in implementing the agreed measures. Although some progress has since been made (e.g. the passing of a new pensions law), the IMF's key con-

Further improvement in many CESEE countries' current account positions

<sup>2</sup> The bulk of these profits was however reinvested, thereby strengthening the financial account.

## National Currencies and the Euro

Euro per unit of national currency, change in %



Source: Thomson Reuters, OeNB.

dition of raising household gas prices has so far still to be met. As for Hungary, against a background of growing refinancing problems, it turned to the IMF and the European Commission in mid-November 2011 to open talks about a contingent credit line facility.

After particularly high budget deficits owing to the recession in 2009, in 2010 deficits decreased slightly in several countries. In the entire region, nevertheless, deficits mostly exceeded the ceiling of 3% of GDP and, in all EU Member States belonging to this group of countries, an excessive deficit procedure is currently in force. According to the current stability and convergence programs, the target dates scheduled for reducing budget deficits should be met in all the countries in the region (2011 for Hungary and Bulgaria, 2012 for Poland and Romania, 2013 for the Czech Republic and Slovakia). After evaluating these programs, however, the European Commission's assessment is somewhat more skeptical. Poland may have to implement further measures, in addition to those submitted in the draft budget for 2012. As for

Hungary, it cannot be ruled out that, following a budget surplus due to temporary factors in 2011, the deficit target will be exceeded in 2012 unless further measures are adopted.

In the first half of 2011, price pressures were comparatively high in most of the countries under review. Inflation remained at a relatively modest level only in Slovenia, the Czech Republic and Croatia. Increased price pressure was primarily attributable to a surge in food prices in connection with poor harvests in 2010. Furthermore, high energy and commodity prices, alongside hikes in indirect taxes in some countries, also acted to spur inflation. The latter effect was particularly marked in Poland and Slovakia. In both countries, VAT was increased in early 2011. The surge in inflation peaked in summer 2011, however. In recent months, the region has seen an easing off in inflation owing to two factors. First, base effects (e.g. following the VAT increase in Romania in July 2010) contributed to this development. Second, pressures on food prices subsided in the wake of the harvests in 2011. In September 2011, inflation ranged

Continued high budget deficits despite a modest decline in 2010

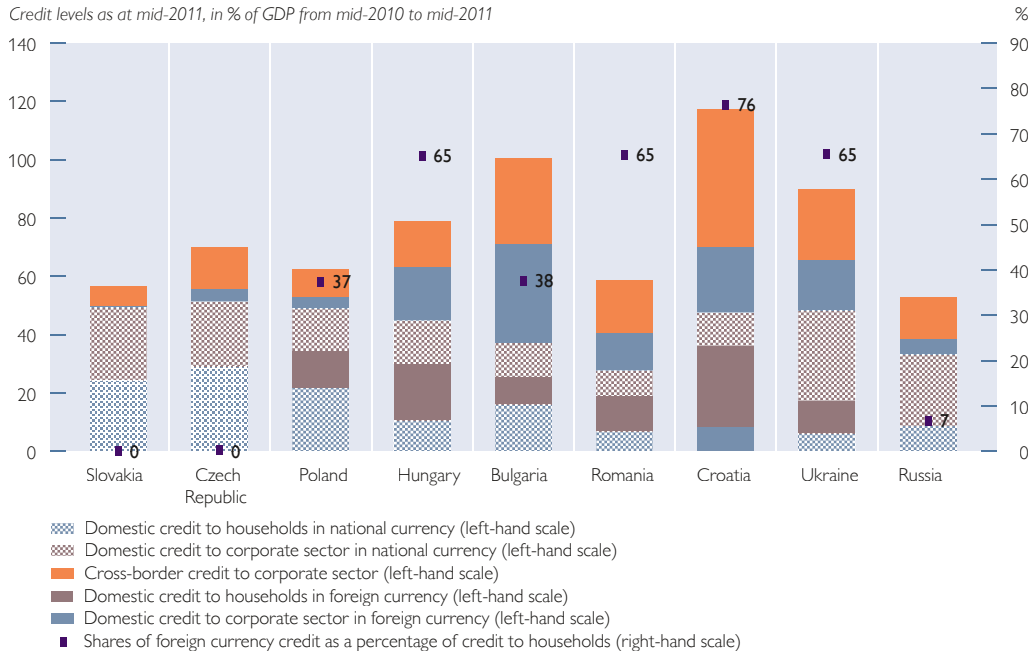
Surge in inflation peaked in summer 2011



Chart 11

## Outstanding Total (Domestic and Cross-Border) Household and Corporate Credit

Credit levels as at mid-2011, in % of GDP from mid-2010 to mid-2011



Source: ECB, Eurostat, national central banks, national statistical offices, OeNB.

Note: Foreign currency credit also includes credit in national currency that is indexed to foreign currency. Cross-border credit does not include trade credits and intracompany loans. Points refer to the shares of foreign currency credits to households as a percentage of total credit to households in % (right-hand scale).

between 2.1% in the Czech Republic and Croatia to 6.7% in Russia.

Looking at the currencies of the countries under review that have yet to adopt the euro and that lack fixed or quasi-fixed currency pegging, all currencies except for the Ukrainian hryvnia depreciated against the reference currency, some of them sharply, in the observation period – and, especially, toward the end of this period. These instances of depreciation were concentrated particularly in the period from mid-June 2011. Several central banks – especially, the Romanian, Polish, Croatian and Russian central bank – intervened on the foreign exchange markets in a bid to support their currencies. In Croatia, moreover, the minimum reserve rate was raised from 13% to 14% and, in Russia, the exchange rate band

of the ruble relative to its USD/EUR currency basket was adjusted from 32.15–37.15 to 32.60–37.60.

Increased levels of uncertainty owing to the flagging world economy and the repercussions of the debt crisis took its toll on the financial markets. Since mid-2011, every CESEE country covered in this report has suffered equity market losses, which on average did not prove as high as in Western Europe, however. The Ukrainian, Czech and Hungarian stock exchanges incurred the heaviest losses, while their Slovakian counterpart registered only modest ones.

The increase in global risk aversion also had a knock-on effect on CESEE countries, raising their financing costs. Risk premiums as measured by CDS spreads have risen across the region

Depreciation pressures prompt central bank intervention

Increased risk aversion grips financial markets

since mid-2011. This increase was particularly steep in Ukraine and Hungary. In addition, Eurobond spreads widened in the entire region, with the increase most pronounced in Ukraine, Hungary and Croatia. Short-term interbank rates showed a varying picture. In the Czech Republic and in Bulgaria, the spreads relative to the euro area have narrowed moderately since mid-2011. While short-term interbank rates fell slightly in both these countries, they remained largely constant in the euro area. In Poland and Romania, by contrast, spreads grew modestly while, in Croatia, they widened considerably. The noticeable rise in short-term interest rates in Croatia is explained by the tightening of liquidity in the domestic money market (partly via the issuance of bonds and the announced increase in minimum reserves in October 2011).

In most countries of Central Europe, total outstanding loans to private households (relative to GDP) were higher in mid-2011 than at end-2010. By contrast, they were marginally

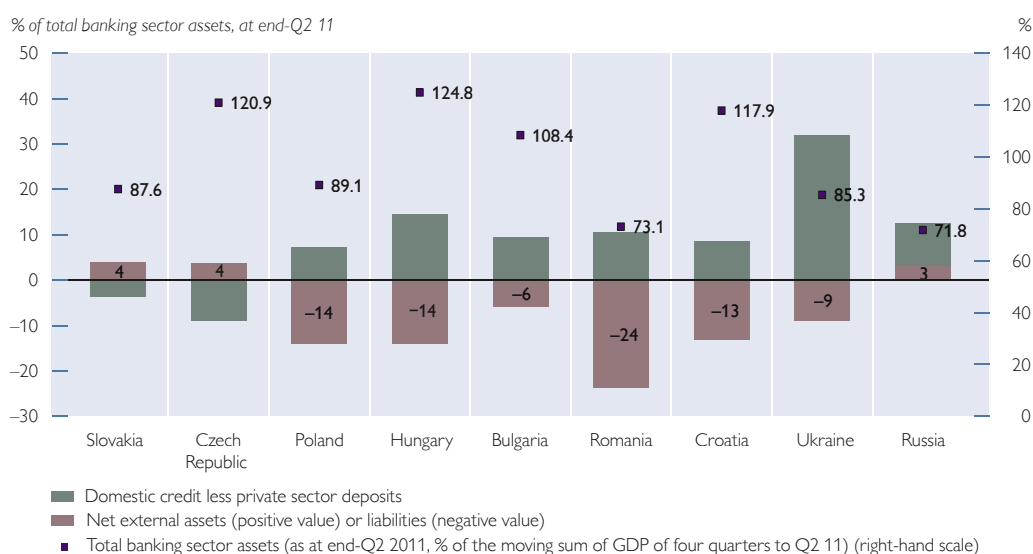
down in Romania and Croatia and markedly so in Bulgaria, Ukraine and Hungary. Total outstanding loans (relative to GDP) to nonfinancial companies largely grew in tandem with household loans. Loans in this sector showed a divergent development only in Russia, Croatia and Romania. Whereas non-financial corporate loans rose in the latter two countries, they were in decline in Russia. With the exception of Hungary, every Central European country's domestic loan market registered (currency-adjusted) modest growth in household and nonfinancial corporate loans. Cross-border loans to corporates declined in the entire region, however.

At 65 % to 76 %, the share of foreign currency loans to households remained very high in Hungary, Romania, Ukraine and Croatia at mid-2011. Compared with end-2010, however, it was considerably lower in Hungary, Ukraine and in Russia (albeit at a lower level) while it rose in Croatia and Bulgaria (from a lower level). Total

Share of foreign currency loans to households down in some countries  
Modest loan growth in Central Europe

Chart 12

### Banking Sector: Gap between Loans and Deposits and Net External Liabilities



Source: ECB, Eurostat, national central banks, national statistical offices, OeNB.



foreign currency loans to households (currency-adjusted) were up in Croatia and Bulgaria, while the volume of household loans denominated in domestic currency contracted.

At mid-2011, total outstanding domestic loans exceeded total domestic deposits (as measured by total assets) in the majority of countries under review. In most countries, however, the loan-to-deposit ratio is trending down. Domestic deposits continued to exceed domestic loans only in Slovakia and the Czech Republic. Both countries also registered positive net external assets. The gap between domestic loans and deposits yawned particularly widely in the Ukrainian banking sector (31.9%), while ranging between 7.1% and 14.5% of total assets in the other countries. Compared with 2010, the gap between domestic loans and deposits narrowed markedly in Hungary, Bulgaria and Ukraine and, to a lesser extent, in Romania. Among the countries under review, Romania is also the country

where the banking system's net external liabilities – of which some comprise liabilities to foreign parent banks – are the highest relative to GDP.

The share of nonperforming loans in the banking sector remained high at the end of the second quarter of 2011. After the share of bad loans started to be significantly reduced in the second half of 2010, in the first half of 2011 most countries saw a marked increase in the share of nonperforming loans. The rise was highest in Romania (6.4 percentage points) – from an already high base level – Bulgaria (3.4 percentage points) and Hungary (2.8 percentage points). Croatia (1.7 percentage points) and the Czech Republic (0.4 percentage points) witnessed a slight increase. As for Russia, Poland and Slovakia, they saw a modest decline year on year. Looking at quarterly development, countries which registered increases in the share of bad loans on a 12-month basis saw a particularly steep rise in these shares in the

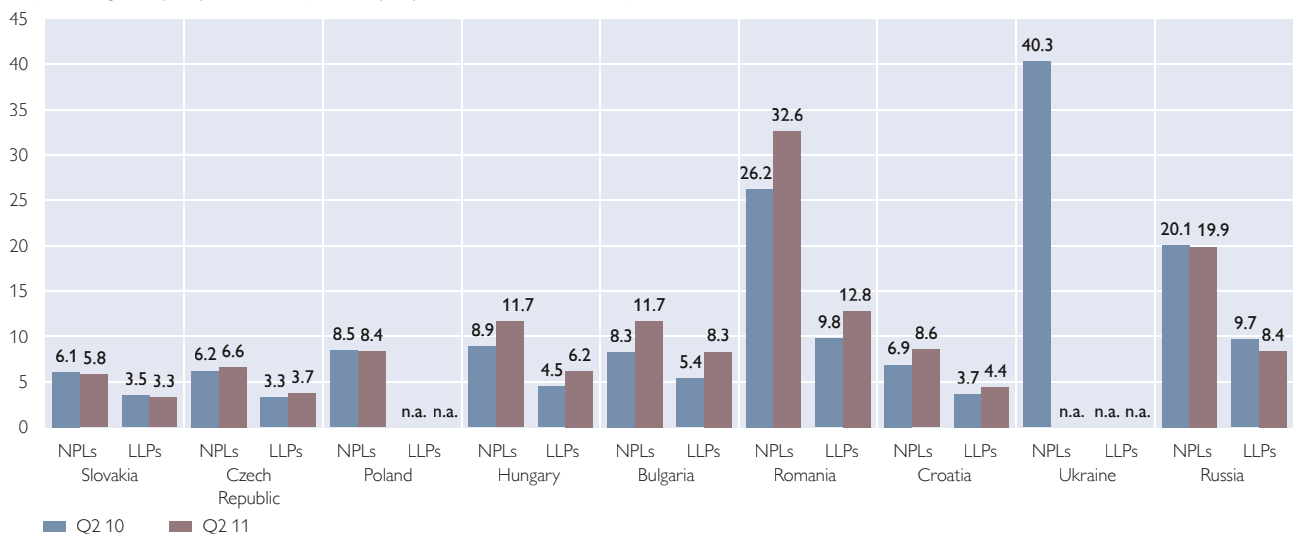
Credit risk remains high in banking sector

Credit gap narrows in some countries

Chart 13

### Banking Sector: Credit Quality

Nonperforming loans (NPLs) and loan loss provisions (LLPs) in % of total credit, at end of period



Source: IMF, national central banks, OeNB.

Note: Data are not comparable between countries. NPLs include substandard, doubtful and loss loans. Poland including so-called irregular loans.

## Banking Sector: Profitability

Return on equity (RoE) and return on assets (RoA), in %



Source: IMF, national central banks, OeNB.

Note: Data are not comparable between countries. Data are based on annualized after-tax profit, except for Russia's, which are based on pretax annualized profit.

### Banks' capital adequacy up in Central Europe

first quarter of 2011. In the second quarter of 2011, quarter-on-quarter increase was relatively small.

### Banking sector profitability up slightly

In the first half of 2011, banking sector profitability stabilized or, in some cases, slightly improved in most of the countries under review. Profits rose particularly sharply in Slovakia and Russia, while falling on a year-on-year basis only in the Czech Republic (from a high level) and Bulgaria (from a lower level). In Romania, the banking sector generated small profits in the first half of 2011 after incurring losses in the previous period. Owing to still high loan loss provisions necessary due to an increase in nonperforming loans, the Ukrainian banking sector continued to post losses. Compared with 2010, however, these losses were reduced by a significant margin.

Except for Poland, which experienced a slight decline, the capital adequacy of banks in most Central European countries was higher at mid-2011 than at end-2010. In the Czech Republic, it grew by 0.8 percentage points and now stands at 16%, well exceeding the level of other Central European countries. Although banks' capital adequacy in Russia (-1.3 percentage points) and Ukraine (-1.6 percentage points) was lower at mid-2011 than at end-2010, it remained at a high level. At mid-2011, this means the capital adequacy ratio ranged between 12.7% and 14.2% in Slovakia, Poland, Hungary and Romania and between 16% and 17.7% in the Czech Republic, Russia and Bulgaria. In Ukraine, banks' capital adequacy stood at 21.7%.

# Real Economy's Risk Position Remains Below Precrisis Level

## Volume of Corporate Sector's External Financing Low

### Economic Activity Slows Down

After Austria's economy had expanded vigorously in the first half of 2011 as a result of the global economic recovery, the upturn came to a halt at mid-year. Among the reasons for slowing growth are loss of confidence caused by the sovereign debt crisis, weakening economic stimulation from abroad, sluggish domestic activity and expiring cyclical growth drivers.

Compared with the intensity of the slump recorded during the global economic and financial crisis, the rebound of investment activity during the economic upswing turned out to be relatively modest. The low investment level suggests that the majority of investments did not aim to expand capacities but rather replace existing production facilities. Planned investments were delayed yet again, as the external environment had weakened and the sovereign debt crisis had strongly increased uncertainty among companies. Pros-

pects for building construction had brightened somewhat in the first half of 2011 but suffered a downturn afterward, with residential and nonresidential construction being equally affected.

Corporate profits, which declined substantially during the economic downturn of 2008 and 2009 – a fact which constituted a major shock absorber – have been rising again for almost two years. Since the second half of 2010, the gross operating surplus – in real terms – has once again been above precrisis levels (in the second quarter of 2011, it was above precrisis levels in nominal terms as well), even if corporate profit growth slowed down again to 2.8% in the second quarter. The gross profit ratio, which expresses the gross operating surplus in relation to gross value added, has also been on the rise again since 2010 but has yet failed to reach its precrisis highs. A similar trend can be observed for profit margins (i.e. the margin between the selling prices charged by companies and the manufacturing costs they incur

Economic upturn comes to an end

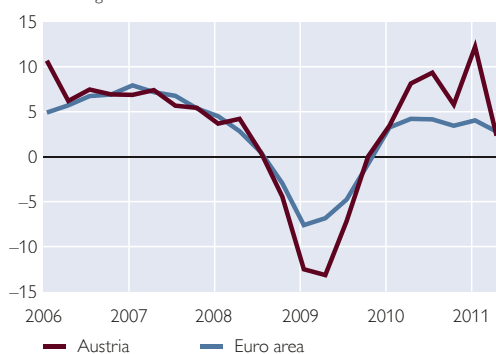
Profits on the rise again

Chart 15

## Macroeconomic Profit Indicators

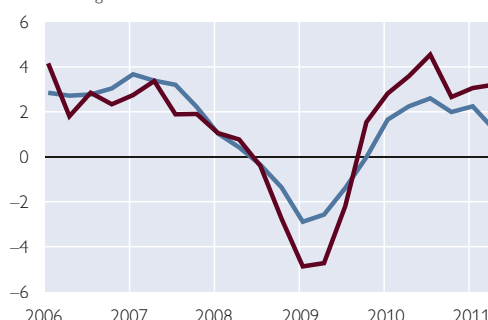
### Gross Operating Surplus<sup>1</sup>

Annual change in %



### Profit Margin<sup>2</sup>

Annual change in %



Source: Eurostat.

<sup>1</sup> Including mixed income of the self-employed.

<sup>2</sup> GDP deflator less unit labor costs.

and, consequently, a proxy for the mark-up at the macro-level).<sup>1</sup> Both indicators show that corporate profits in Austria were slightly more volatile than in the euro area: While falling more strongly at the peak of the crisis, they went up faster afterward. Until the first half of 2011, this growth reflected a continuous rise in sales, while at the same time the strain on corporate costs was relieved as wage increases were only moderate. Moreover, the nonoperational component of the corporate profits was boosted by the fact that the interest rate level continued to be relatively low.

#### External Financing Has Dropped Further

Equity financing going up

As options to resort to internal sources of finance improved, companies required lower volumes of external financing. According to financial accounts data, the volume of external financing came to EUR 7.7 billion<sup>2</sup> in the first half of 2011, which is nearly one-third below the comparable 2010 figure and corresponds to just one-quarter of the 2007 figure. In the first half of 2011, corporate financing increasingly relied on equity instruments, which contributed more than 40% to external financing, up from less than 20% in the first six months of 2010.

Stable financing conditions

#### Bank Lending Recovers Slowly

Moderate bank lending growth

Bank loans continued to contribute relatively little to the growth of overall external financing in the first half of

2011, even though their share rose to approximately one-eighth (first half of 2010: 4%).<sup>3</sup> Bank loans extended to the corporate sector have moderately gone up for about one year. According to the MFI balance sheet statistics, the annual rate of change in Austrian bank lending (adjusted for reclassifications, valuation changes and exchange rate effects) stood at 2.2% in September 2011, which more or less corresponds to the euro area growth rate.<sup>4</sup> Lending at longer maturities (more than five years), in particular, recorded stable growth rates and for the first time in two years, short-term loans (less than five years) had stopped contracting by August 2011.

The slight rise in lending appears to be attributable to both supply- and demand-side factors. The results of the Eurosystem's Bank Lending Survey (BLS) for Austria indicate that banks' credit standards for corporate clients had been stable over a two-year period until they were tightened somewhat in the third quarter of 2011 when bank's own financing conditions deteriorated slightly. At the same time, moderately growing investments caused a rise in corporate loan demand. However, the BLS registered a marginal decline in corporate loan demand in the third quarter of 2011, when economic growth slowed down again.

Until the third quarter of 2011, financing costs had eased the burden on loan financing. Although interest rates for corporate loans rose to 2.69% by

<sup>1</sup> As national accounts data for the individual economic sectors are published on an annual basis only, quarterly corporate profit figures for the corporate sector are not available.

<sup>2</sup> Adjusted for foreign-controlled holdings in special purpose entities (SPEs).

<sup>3</sup> At the cut-off date, financial accounts data were available through the second quarter of 2011, which means that growth contribution data presented here refer to the first half of 2011. More recent developments of financing flows are illustrated using data from the MFI balance sheet statistics and securities issues statistics.

<sup>4</sup> For more information on the current developments of bank loans to the corporate sector, see the OeNB's lending report (Kreditbericht, available in German only at [www.oenb.at](http://www.oenb.at)).

September 2011, thus gaining around ½ percentage point against their April 2010 low, they were still 3 percentage points below their October 2008 levels (i.e. immediately after the Lehman bankruptcy). As indicated by the BLS, the noninterest components of loan conditions, which had been tightened during the crisis, have remained mostly unchanged since mid-2010.

Box 1

### Corporate Lending: An Econometric Analysis

*Like in most other euro area countries, net new lending has weakened significantly in Austria as a result of the financial and economic crisis. The number of loans extended to Austrian nonfinancial corporations actually contracted for the most part of 2010. Given this development and the high share of bank loans in corporate financing, the analysis of corporate loans has gained significance for economic policymaking. In this context, a particularly crucial question is whether there is a credit crunch, i.e. banks' credit supply is lower than what was to be expected in view of the current macroeconomic environment.*

*In addition to the descriptive statistical analyses as presented e.g. in the OeNB's lending report (Kreditbericht), there are other approaches to examining bank lending developments and their determinants. These include, for example, conducting surveys of banks and companies regarding credit supply and credit demand or analyzing banks' and borrowers' balance sheet data. Furthermore, lending trends can be analyzed by applying econometric methods on the basis of macroeconomic data. The first preliminary results of an error correction model of bank lending to Austrian nonfinancial corporations are presented below.*

*The survey considers real quarterly data (i.e. adjusted for price changes) from the first quarter of 1988 through the first quarter of 2011, focusing on lending to nonfinancial corporations (outstanding amounts). Moreover, the model takes into account the three-month interest rate, which should help approximate borrowing costs fairly reliably because of the high share of variable-rate loans in total loans, gross fixed capital formation as an approximation variable for credit demand and gross operating surplus as a measure of internal financing capacities as well as of companies' credit quality. Our analysis did not reveal any evidence that other benchmarks used in the relevant literature, e.g. banks' equity or the number of corporate insolvencies, increased the model's explanatory power.*

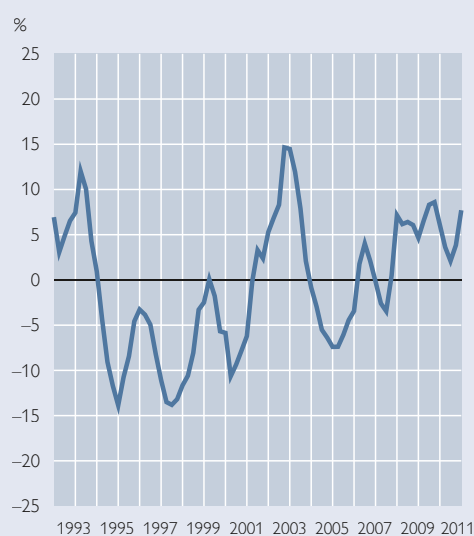
*The following discussion focuses on the long-term connection between the considered variables, which may be interpreted as an equilibrium relationship and may shed light on the question of whether lending development is in line with macroeconomic fundamental data. We find that investment exerts a major influence on lending: A 1% increase in investment, for instance, will cause the volume of credit outstanding to rise by 1.6% in the long run. This considerable influence does not come as a surprise, as companies borrow primarily for investment purposes. An interest rate hike of one percentage point will diminish the volume of credit outstanding by 8%. If the gross operating surplus increases by 1%, the credit volume will go down by 0.8%. This means that the decline in demand resulting from improved internal financing capacities is more pronounced than any potential supply effects due to improved creditworthiness. The drop in borrowing resulting from an increase in gross operating surplus appears plausible because such an increase improves the ability for internal financing and – according to pecking order theory – companies prefer internal financing by means of retained earnings to external financing by loans.*

*In periods in which loans deviate particularly clearly from the equilibrium relationship assumed in the model, other factors exert an especially strong influence on loans. The chart below shows corporate loans' deviation from their equilibrium stock in percent. For the period since the outbreak of the financial and economic crisis in mid-2007, the chart neither shows a trend of excessive lending (i.e. a marked positive deviation) nor a long-term shortage in lending (i.e. a marked negative deviation).*

*The fact that the model results show a slight loan overhang for this period was predominantly attributable to real loans decreasing less sharply than real investment. This develop-*

ment could be related to the fact that since the onset of the crisis companies have primarily focused on making replacement investments, which are subject to less uncertainty and for which, probably, more collateral is available, which makes it easier to finance them via loans. At the same time, this result can be interpreted as evidence for a functioning house bank principle, according to which banks – in the case of long-term customer relationships – smooth their lending over the business cycle and, therefore, will be less hard-pressed to restrict lending in the event of a downturn. A similar development was observed in other periods of declining investment (1992 to 1993 and 2001 to 2002). Moreover, gross fixed capital formation does not fully capture companies' credit demand. Austrian outward direct investment, for example,

#### Real Bank Lending to Companies – Deviation from Equilibrium Level



Source: OeNB, authors' calculations.

Note: The chart shows the moving four-quarter average.

which is largely financed through loans, is not included in investment statistics. The significant reduction of direct investment observed during the past few years is therefore likely to be another factor that contributed to the loan overhang shown in the chart. By contrast, the extraordinarily strong interest rate cuts with which the ECB responded to the crisis have caused the equilibrium loan level to rise and, consequently, facilitated an approximation of the actual volume of credit outstanding to the equilibrium level as lending contracted. During the crisis period, the gross operating surplus had only a minor influence on loan overhang developments.

It should be noted, however, that any possible instabilities of the model – especially in the context of the financial crisis – could impair the results. For an assessment of the credit market situation, the results presented here must not be viewed independently but may serve to complement the results of other analyses.

#### Bonds account for sizeable portion of corporate financing

#### Sustained Expansion in Bond Financing

At 31%, bond issues accounted for an above-average portion of Austrian companies' financing in the first half of 2011. Corporate bond issues have gained some momentum throughout 2011, and securities issues statistics show that despite a slight decline in September, corporate bond issues recently posted an annual growth rate of 6.7%, which means that their expansion rate still markedly exceeded that of other financing instruments. In line with the downward movement in interest rate levels, the share of variable rate bonds, which had been in decline since fall 2008, had dropped to 12.7% by September 2011. Likewise, the

proportion of foreign bond issues saw a continuous decrease as of mid-2010 and was slightly below 10% in September 2011.

Until recently, bond yields remained at low levels, thus mirroring the development of lending rates. As of mid-2011, however, yields for lower-rated bonds clearly reflected investors' reduced risk appetite. While, at 3.32%, yields on AAA-rated bonds were nearly half a percentage point below mid-year levels in October 2011, yields on BBB-rated bonds came to 6.07% at the same time, which is approximately one percentage point higher than at mid-year.<sup>5</sup> In the second half of 2011, the yield spread

<sup>5</sup> Euro area figures are used here, as no times series is available for yields on Austrian corporate bonds.



between BBB issues and top-rated euro-denominated corporate bonds widened from 127 to 275 basis points. Such a high figure had last been recorded in June 2009. Nonetheless, bond yields were still significantly lower (between 2.3 and 3.3 percentage points, depending on their rating class) than the peak levels recorded at the height of the financial market turmoil in the fall of 2008.

**Slight Recovery in Equity Financing**

Financing via the stock exchange, which the crisis had severely constrained for a long time, picked up at the end of 2010 and continued its moderate upward momentum in the first half of 2011. In

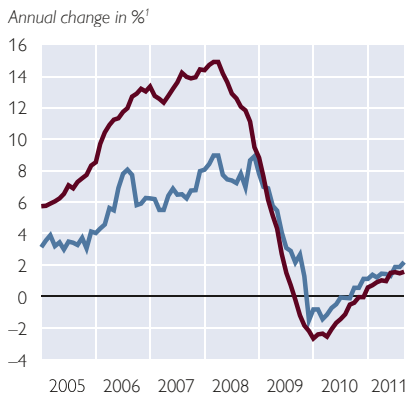
this period, quoted stocks accounted for a little over 10% of nonfinancial corporations' external financing volume. In the first eight months of 2011, the level of corporate funds raised via the stock exchange was, at EUR 4 billion, almost four times as high as in the same period of the previous year. However, almost all companies that raised (additional) capital via the stock market had already been listed on the stock exchange; there has only been one new listing on the Vienna Stock Exchange (in April 2011) since the onset of the crisis. In line with falling stock prices – the ATX plunged 30% in the third quarter of 2011 – financing via the

Capital increases in the first half of 2011

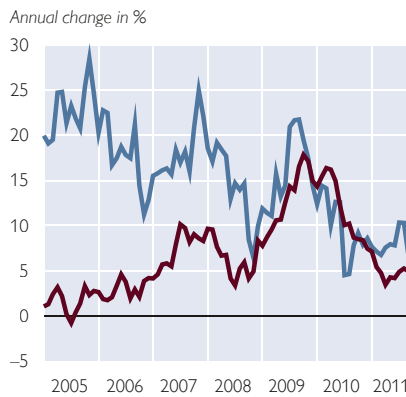
Chart 16

**Volumes of and Conditions for Key Elements of Nonfinancial Corporations' Financing**

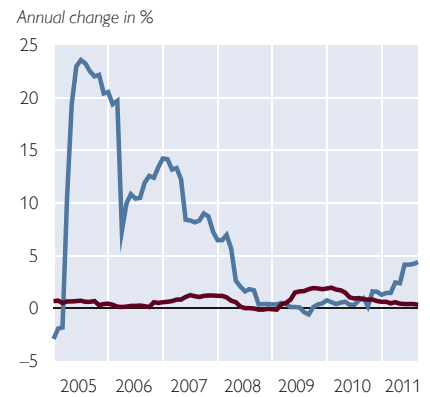
**Loans: Volumes**



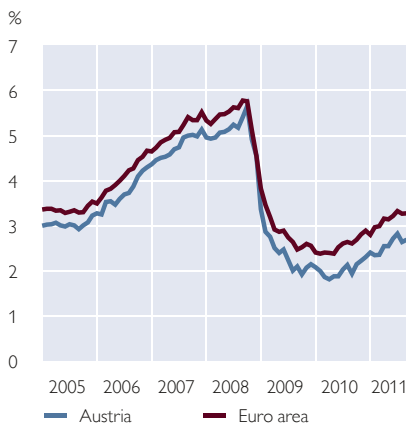
**Bonds: Volumes**



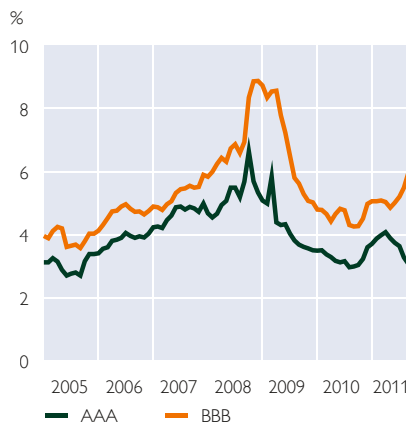
**Quoted Stocks: Volumes**



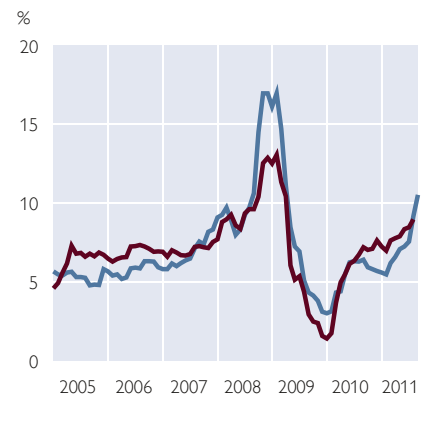
**Loans: Interest Rate**



**Bonds: Yields**



**Quoted Stocks: Earnings Yield**



Source: OeNB, ECB, Thomson Reuters, Wiener Börse AG.

<sup>1</sup> Adjusted for reclassifications, valuation changes and exchange rate effects.

stock market slowed down dramatically in the second half of the year.

Measured in terms of earnings yields (i.e. the inverse of the price-to-earnings ratio), the cost of raising capital on the Austrian stock market has increased considerably since mid-year as a result of sharply falling prices. From June through October 2011, the earnings yield increased from 7.2% to 10.9%, but still remained clearly below the highs of almost 17% recorded during the crisis at end-2008.

At EUR 2,4 billion, over-the-counter equities accounted for close to one-third of external financing in the first six months of 2011. In total, corporations obtained 43% of their external financing in the form of equity in 2010. Relative to its total liabilities, the corporate sector's equity position (i.e. the proportion of stocks in total liabilities and shareholders' equity) held virtually steady at nearly 43% in the first half of the year.

### Still no Noticeable Improvement of Risk Indicators

The financial position of the corporate sector, which in some cases had deteriorated sharply in 2010 as a result of the crisis, has stabilized or even improved slightly over the course of 2011, but some key creditworthiness indicators were still well below precrisis level. Corporate debt (in terms of total of loans and bonds) saw a decline in growth to 5.2% in the first half of 2011. As corporate earnings recovered further at the same time, the ratio of corporate debt to profits fell slightly in the first half of 2011, which suggests elevated debt servicing capacity. At 270% of the gross operating surplus, however, the debt ratio of the Austrian corporate sector was still considerably

higher than before the outbreak of the crisis and also higher than in the entire euro area. The debt-to-equity ratio of Austrian companies was also higher than in the euro area, which gives evidence of the great significance of debt financing in Austria. In the first half of 2011, the debt-to-equity ratio remained relatively stable.

In the past two years, the subdued pace of borrowing, coupled with low interest rates, kept interest expenses down, which relieved the burden on (aggregate) corporate sector costs.<sup>6</sup>

However, interest expenses have risen somewhat since the middle of 2010, largely owing to a slight rise in interest rates. But even though the corporate sector's debt-to-equity ratio had remained stable throughout the crisis and its exposure to interest rate risk had not climbed overall, rising interest rates might create a noticeable burden for highly indebted companies.

This aspect is all the more relevant since the Austrian corporate sector exhibits an above-average share of variable loans, making it substantially vulnerable to interest rate risk. Austrian companies have a share of foreign currency loans that is almost twice as high as that of companies in the euro area. This figure has been stable over the past few years and is significantly lower than the comparable figure for the household sector.

The relatively low expansion of debt financing and the low interest rate level, which make debt servicing easier for more highly indebted companies, are probably among the reasons why the number of corporate insolvencies has risen relatively little during the crisis compared to the intensity of the economic slump and has even declined

Variable rate loans  
cause interest rate  
risk

Corporate equity  
position unchanged

Debt servicing  
capacity still below  
precrisis level

Number of  
insolvencies down

<sup>6</sup> This does not apply to companies that have not taken out bank loans.

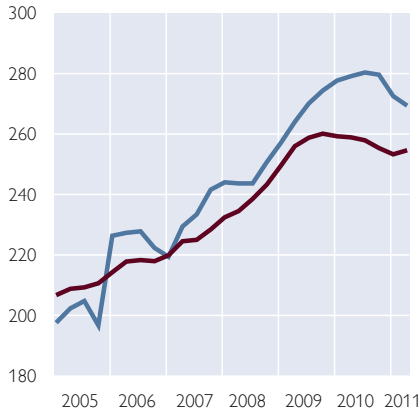


Chart 17

## Risk Indicators for Nonfinancial Corporations

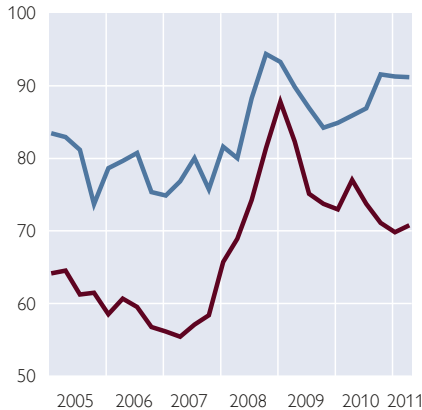
### Debt

% of gross operating surplus



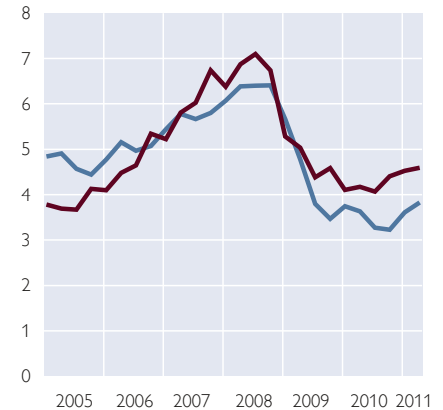
### Debt-Equity-Ratio

%



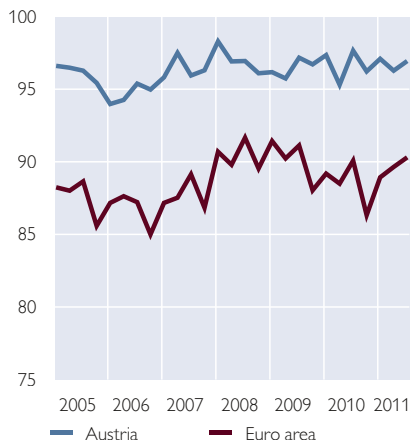
### Interest Expense

% of gross operating surplus



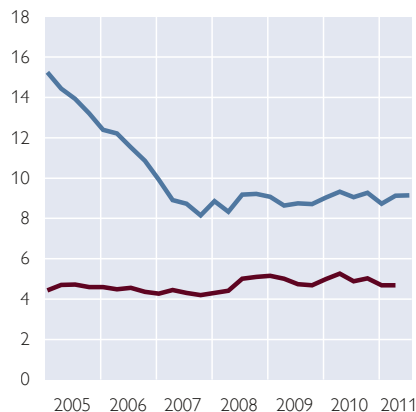
### Variable Rate Loans

% of total new lending



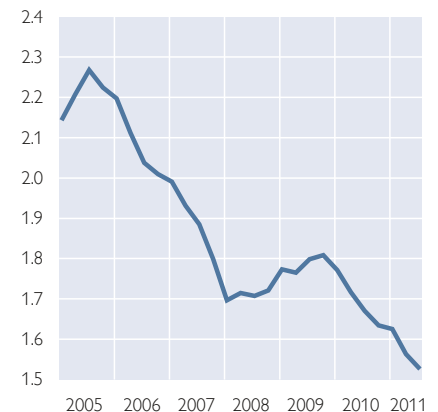
### Foreign Currency Loans

% of total assets



### Insolvencies

Number of insolvencies in % of companies



Source: OeNB, ECB, Eurostat, KSV 1870.

since mid-2010. Based on the total of the past four quarters to rule out seasonal fluctuations, the number of insolvencies in the third quarter of 2011 was 6.8% below the 2010 figure; it also dropped in relation to the number of companies.

### No Improvement in Households' Risk Situation

#### Sluggish Growth in Income and Consumption

While public sector consolidation measures and rising inflation in the first

three quarters of 2011 placed a burden on households' disposable income, favorable labor market conditions provided a positive stimulus to the income situation. Overall, development of real household income in 2011 remained subdued. Against this backdrop, consumer spending increased only slightly, but still by a higher margin than income, sending the saving ratio further down. By the second quarter of 2011, households' saving ratio had been contracting for two years and went down to 7.2% (average of the past four quarters).

Reduced propensity to save

Investments in life insurance have a stabilizing effect

Bank deposits' share in financial investment contracts sharply

Considerable unrealized valuation losses

Capital market investment slows down

### Financial Investment Still Low

In step with the reduced saving ratio, households'<sup>7</sup> financial investment continued to be sluggish in the first half of 2011 and, at EUR 5.6 billion, was 2.6% higher than in 2010, but 47% below the peak recorded in the first half of 2007 before the crisis took hold.

After their contribution to financial investment had been extraordinarily low (3%) in the second half of 2010 in response to the announcement of a capital gains tax on securities, deposits again contributed more than one-third (EUR 1.9 billion) to financial investment in the first half of 2011. Their growth, however, remained slow at 1.0% – relative to financial assets one year ago. At the same time, new deposits changed in structure: The shift from time deposits to overnight deposits which had been recorded since 2009 came to a halt in mid-2011; since June 2011, deposits with agreed maturity actually increased again, especially time deposits, whereas savings deposits continued to fall. The modified maturity structure suggests that the strong preference for liquidity, which had shaped households' investment behavior in the previous years, may have exercised a somewhat less significant influence this year.

Moreover, in light of the sharp drop in stock prices, investor uncertainty appears to have grown again slightly. That is why, in the first half of 2011, capital market investment accounted for only some 20% of households' overall financial asset accumulation. Its growth rate slipped from 3.9% to 1.2%. Debt securities posted considerable growth in the first half of 2011, whereas mutual fund shares and quoted stocks were reduced

in net terms owing to the massive stock price losses.

As in the preceding years, investments in life insurance and pension funds had a stabilizing effect on financial investment. They accounted for around one-third of overall financial investment in the first half of 2011. A large proportion of capital inflows attributable to these investment instruments is not, however, the result of current investment decisions, but – given the extended maturities and commitment periods and the predominantly long-term objectives associated with these instruments – rather reflects decisions that were made earlier. A key underlying force in this context is the growing trend for funded pension instruments. Moreover, life insurance policies are frequently used as repayment vehicles for foreign currency bullet loans.

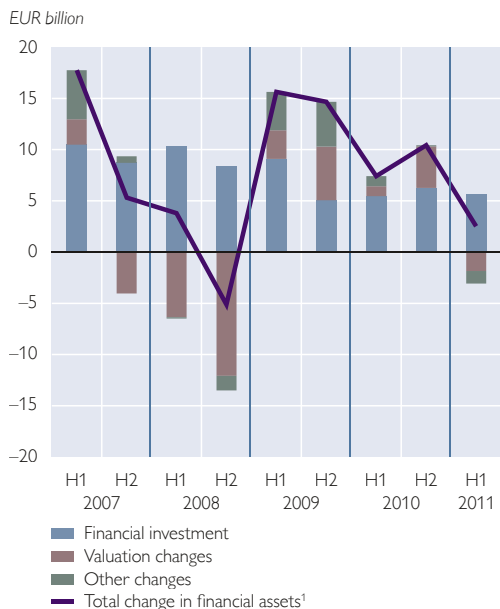
In mid-2011, the financial assets of Austrian households amounted to EUR 471 billion, up EUR 2.5 billion against end-2010. This means that financial asset growth was approximately EUR 3.1 billion lower than financial investment in the first half-year. To a great extent, this discrepancy reflects the considerable (unrealized) valuation losses in households' security portfolios, which reached nearly EUR 1.9 billion in the first half of 2011. In relative terms, quoted stocks were affected most strongly by price losses, accounting for 4.9% of the stock at end-2010, while in the case of mutual fund shares it was 2.8%. Debt securities also posted valuation losses. Another EUR 0.7 billion in valuation losses were recorded for investments in life insurance policies and pension funds.

<sup>7</sup> Not including nonprofit institutions serving households.

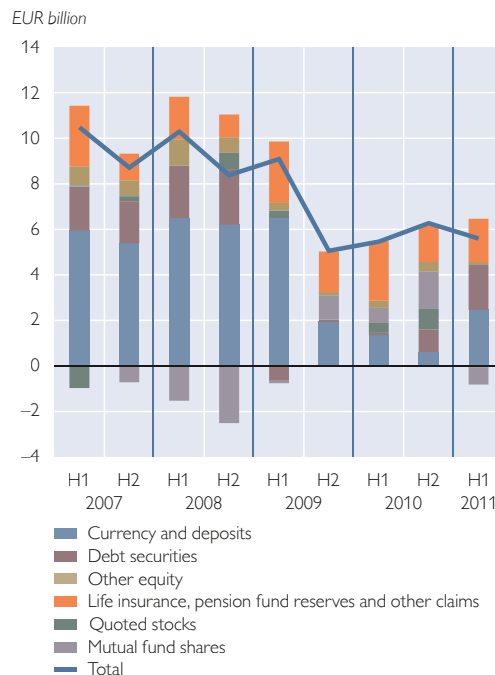
Chart 18

## Changes in Households' Financial Assets

### Determinants of Changes in Financial Assets



### Components of Households' Financial Investment



Source: OeNB.

<sup>1</sup> 2006: financial investment and valuation changes only.

## Subdued Lending Growth

According to Austria's financial accounts, bank loans accounted for slightly over 85% of households' financial liabilities in mid-2011. After bank lending to households had exhibited very moderate growth for two years, it accelerated slightly in 2011. In September 2011, the net increase (adjusted to account for reclassifications, valuation changes and exchange rate effects) in banks' loans to households came to 1.7%.

Examining loans in terms of currencies, we find that euro-denominated loans recorded strong gains (September 2011: 4.5%), whereas foreign currency loans fell sharply (-4.9%). The minimum standards on foreign currency lending issued by the Austrian Financial Market Authority led to a significant reduction in new foreign currency lending to households. Owing to the

strong appreciation of the Swiss franc against the euro, however, the foreign currency loan volume rose by EUR 1.2 billion (3.2%) year on year in September 2011 despite the above-mentioned decline in foreign currency loans.

Categorized by purpose, consumer loans saw declines (-4.2% against the previous year), while gains were observed in housing loans (3.9%) and other loans (0.9%). According to the BLS, credit supply from banks had remained stable since mid-2010, which suggests that the current growth in lending appears to be fundamentally rooted in demand-side factors. In the housing loan segment, some indicators are signaling a rise in credit demand. Although no information is available on finished new construction projects, the rising number of residential building permits indicates a slight upturn in

Exchange rate-adjusted decline in foreign currency loans

residential building in the first half of 2011 (9.1% year on year). Concurrently, rising real estate prices are causing an upward shift in demand for funding requirements for the acquisition of real estate on the secondary market.

The framework conditions for household loans have changed only marginally over the course of 2011. Credit standards for both housing and consumer loans were tightened only to a very small extent during the financial crisis and have remained unchanged

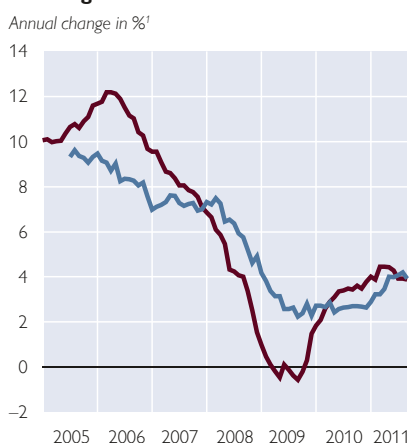
since the third quarter of 2010. Lending conditions continued to be favorable. Even though an increase was observed as a result of two key interest rate hikes in April and July 2011 as well as higher money market interest rates, the interest rate for new housing loans stood at 2.95% in September 2011, which is 0.24 percentage points above the end-2010 figure. Interest rates on consumer loans had started to go up already in 2010 and rose by another 14 basis points to 5.09% in the first nine months of 2011. Nonetheless,

Financing conditions remain favorable

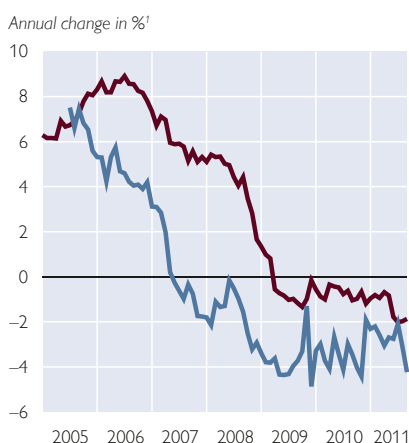
Chart 19

### Volumes of and Conditions for MFI Loans to Households

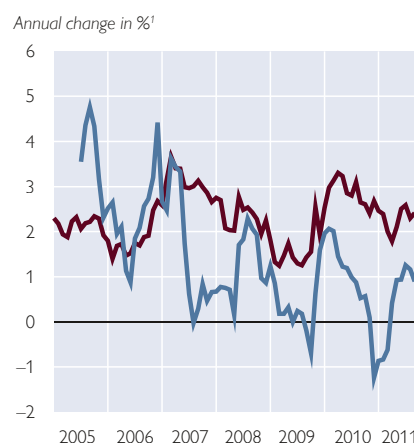
#### Housing Loans: Volumes



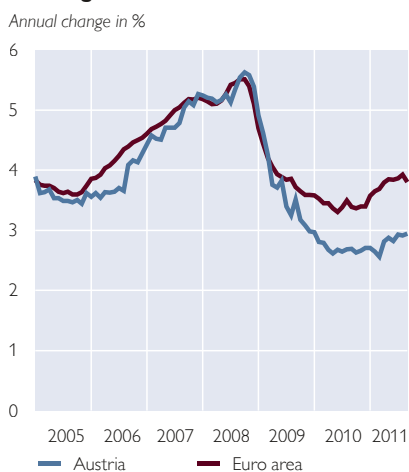
#### Consumer Loans: Volumes



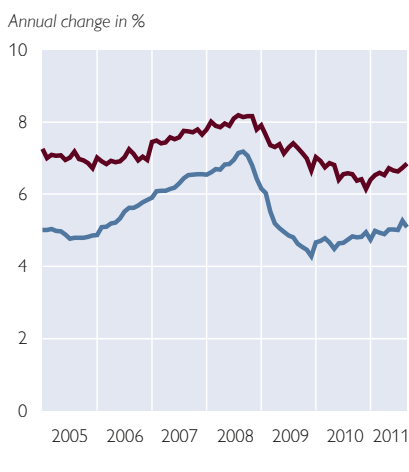
#### Other Loans: Volumes



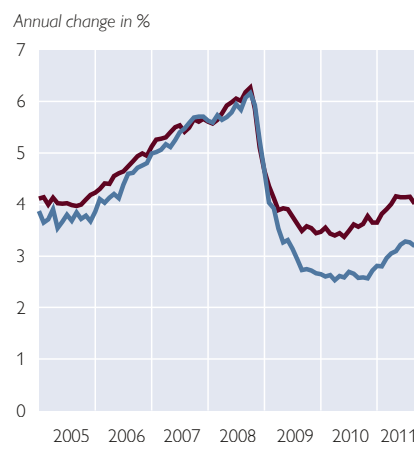
#### Housing Loans: Interest Rate



#### Consumer Loans: Interest Rate



#### Other Loans: Interest Rate



Source: OeNB, ECB.

<sup>1</sup> Adjusted for reclassifications, changes in valuation and exchange rate effects.

they were still 2.6 percentage points (housing loans) and 2.1 percentage points (consumer loans) below precrisis level.

**Households' Currency and Interest Rate Risks**

In absolute numbers, the amount of household debt does not give rise to concern. Moderate borrowing and low interest rates allowed the absolute debt level to remain relatively stable during the crisis, and in mid-2011, it amounted to EUR 166 billion. According to the financial accounts, total household liabilities climbed 3.7% in the past twelve months. Households' debt burden

amounted to 97% of their net disposable income. Thus, the debt ratio continued to be lower than in the euro area as a whole, where the corresponding value was 107%.

Low interest levels and moderate borrowing caused households' interest expenses to remain low, even though they had increased slightly since mid-2010 following a rise in interest rates. In the third quarter of 2011, interest expenses averaged 2.5% of disposable income, slipping by approximately 1.5 percentage points compared to the onset of the crisis three years earlier. One of the factors that favored this drop was the rising proportion of variable inter-

The problem is not the amount of household debt but...

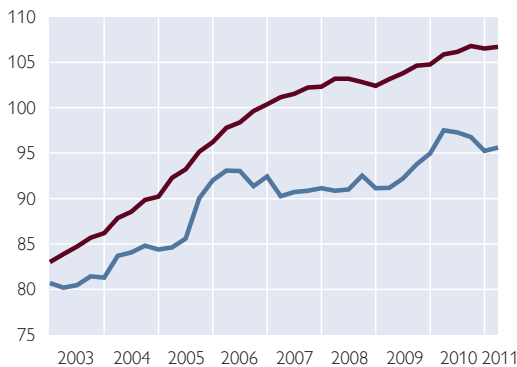
...the short rate fixation periods...

Chart 20

**Household Risk Indicators**

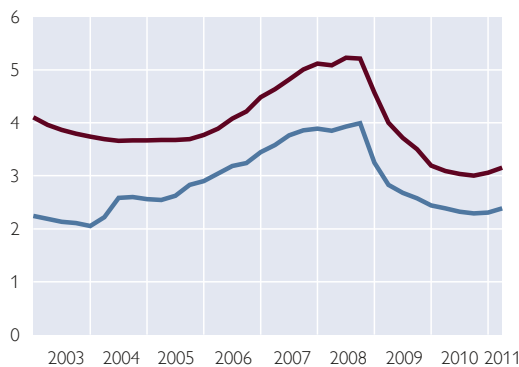
**Liabilities**

% of net disposable income



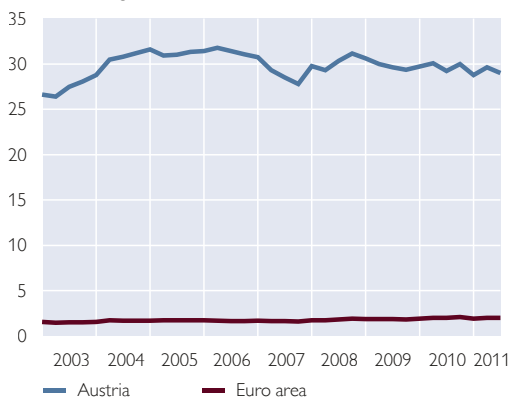
**Interest Expenditure**

% of net disposable income



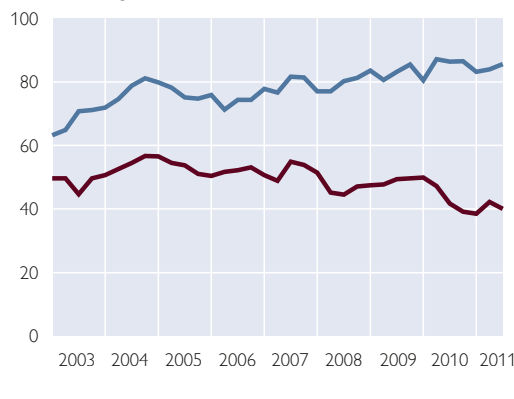
**Foreign Currency Loans**

% of total lending



**Variable Rate Loans**

% of new lending



Source: OeNB, Statistics Austria, ECB, Eurostat.

Euro area: interest expenditure for euro-denominated loans only.

...and the share of  
foreign currency  
loans

est loans. In the third quarter of 2011, 86% of new loans had an initial rate fixation period of up to one year. That share, which is particularly high by international comparison, contributed to the speed with which the ECB's interest rate reductions were transmitted to lending rates in Austria and to the fact that consumer interest rates are lower in Austria than in the euro area in general. However, it would have the opposite effect on interest expenses if interest rates were to climb again.

The sustained high proportion of foreign currency loans constitutes another

risk factor for households' financial positions. In the third quarter of 2011, as much as 29% of households' entire credit volume was still denominated in foreign currency. Although foreign currency loans have been reduced for more than two years on a net basis, their share in the total volume of outstanding loans went down only marginally owing to exchange rate developments in the past few years. Between September 2009 and September 2011, the Swiss franc appreciated against the euro by 26%, which clearly showed the risk potential of foreign currency debt.

# Austrian Financial System Faces a Persistently Difficult Environment

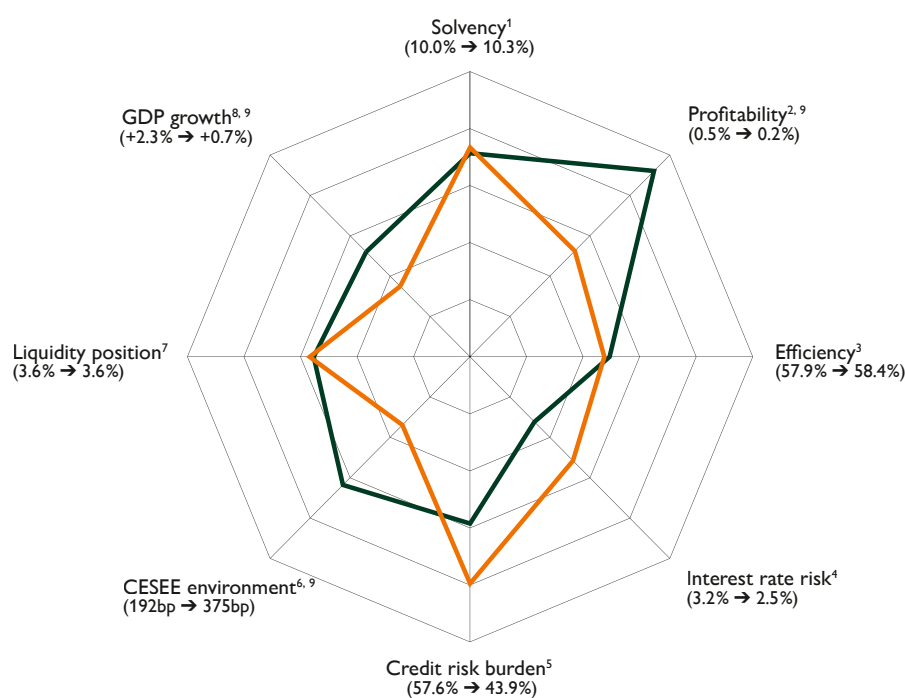
Following a marked economic upturn in the first half of 2011, the lingering uncertainty over public debt problems caused the macroeconomic environment to deteriorate noticeably in recent months. This development also affected Austrian financial intermediaries. Highly volatile stock markets and value losses in certain asset classes led to a substantial decline in profitability, even

though this decline was not yet reflected in the consolidated data for the first half of 2011.

While Austrian banks' capital adequacy ratios improved somewhat in the first half of 2011, building up additional capital buffers would be advisable in light of the volatile market environment and below-peer capitalization levels.

Chart 21

## Banks and Financial Market Stability



— December 31, 2010    — June 30, 2011

Source: OeNB.

<sup>1</sup> Tier 1 ratio.

<sup>2</sup> Return on assets.

<sup>3</sup> Cost-to-income ratio.

<sup>4</sup> 200-basis-point interest rate shock (loss of eligible capital).

<sup>5</sup> Credit risk provisions in % of operating result.

<sup>6</sup> Weighted CDS spread.

<sup>7</sup> Cumulative 12-month funding deficit in % of total assets.

<sup>8</sup> Real GDP growth in % p.a.

<sup>9</sup> Most recent value available at the cutoff date for data; GDP growth: forecast for 2012.

Note: Consolidated figures scaled on the basis of historical data. The closer to the center data points are, the better or less risky. bp stands for basis points

In the first half of 2011, Austrian banks' business in Central, Eastern and Southeastern Europe (CESEE) again accounted for a substantial share in total profitability. This share even increased year on year, which was, however, primarily attributable to a decline in new risk provisions. Therefore, in addition to taking cost-related measures, banks should improve their low domestic profitability, which is due to structural weaknesses.

The liquidity situation of Austrian banks is above all influenced by the difficulties in Europe. Domestic banks responded early on by taking steps to lower liquidity risk. Still, many CESEE subsidiaries continue to rely on their Austrian parent banks for liquidity supply.

In 2011, Austrian banks drastically reduced new foreign currency lending as a result of supervisory initiatives, among other things. The large volumes of outstanding foreign currency loans – both in Austria and in CESEE – constitute a considerable credit risk for domestic banks, though. Moreover, recent data again show that repayment vehicles, which are often used to back such loans, are also subject to substantial market risk.

The claims of the Austrian banking system on euro area countries with an elevated risk profile remain comparatively small and even continued to decline somewhat in the first two quarters of 2011.

Even though the profitability of the Austrian insurance industry improved in the first half of 2011, the public debt crisis and low interest rates posed a challenge for insurers.

In light of recent developments, Austrian banks need to further strengthen the sustainability of their business models in the near future, with respect to both their capitalization and their liquidity supply.

Retail deposits: an important source of bank funding

## Austrian Banking System Is Affected by New Market Turmoil

### Focus on Retail Business Strengthened Further

Austrian banks did not continue the moderate deleveraging process in the first half of 2011. The trend to shrinking balance sheets seems to have come to an end, as the consolidated total assets of domestic banks increased again slightly compared to end-2010 figures, reaching around EUR 1,137 billion in mid-2011. The consolidated leverage ratio was 16.8 at end-June 2011 (end-2009: 19.2).

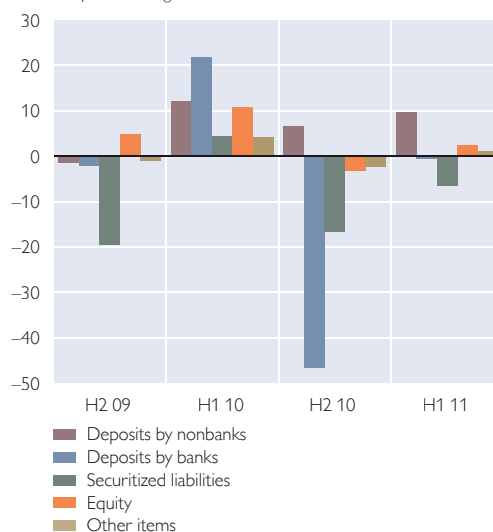
Austrian banks' refinancing strategies have changed markedly in recent years. The share of consolidated retail deposits in total assets continued to rise in the first half of 2011, which further strengthened the banking system's focus on retail business.

Having stagnated in 2010, new lending by Austrian banks increased again slightly in the first half of 2011. The volume of loans to domestic non-banks was EUR 326.1 billion as at Sep-

Chart 22

### Change in Austrian Banks' Refinancing

Period-to-period change in EUR billion



Source: OeNB.



tember 2011, and thus around 0.9% higher than one year earlier. This rise was mainly driven by lending to households and nonfinancial corporations, whereas loans to the public sector stagnated and loans to nonbank financial intermediaries declined substantially.

New foreign currency lending remained low in 2011, which was attributable to turmoil in foreign exchange markets and the associated higher risk aversion of borrowers, among other things. Austrian banks still hold a significant volume of foreign currency loans, though: As at September 2011, the volume of such loans to nonbank customers in Austria alone was around EUR 58.5 billion, which equals a 17.9% share in total loans to this group. Foreign currency loans to households amounted to EUR 41.2 billion at that time. The measures taken by the Austrian Financial Market Authority (FMA) and the OeNB since the onset of the financial crisis to reduce the systemic risk resulting from foreign currency lending thus continued to prove effective. Between October 2008 and September 2011, the volume of foreign currency loans to households declined by 17.4% or EUR 6.9 billion adjusted for exchange rate changes.

A survey among Austrian banks on the risks associated with repayment vehicle-linked loans – which account for 75% of foreign currency loans to households (18% of such loans to businesses) – revealed a funding gap<sup>1</sup> of around EUR 5.4 billion (19% of the outstanding volume of repayment vehicle-linked loans) as at June 2011. At end-2008, the aggregate funding gap had been EUR 4.5 billion (14%). Owing to the appre-

ciation of the Swiss franc against the euro between end-2008 and mid-2011, funding gaps have also emerged in repayment vehicle products that are no direct financial market investments, especially traditional life insurance products. Between June 2011 and early September 2011, the Swiss franc did not appreciate significantly thanks to measures taken by the Swiss National Bank. Still, given the major disruptions in capital markets in the second half of the year, funding gaps in capital market products (almost three-quarters of all repayment vehicles) widened even further.

In the third quarter of 2011, the unconsolidated total assets of Austrian banks edged up again slightly year on year, with cash liquidity increasing markedly, which can be interpreted as a precautionary measure in times of uncertainty.

#### **Loan Loss Provision Ratio Remains High**

At EUR 2.9 billion in the first half of 2011, the new risk provisions set aside by Austrian banks for lending operations were again lower than in previous periods but still markedly higher than in the precrisis years (see chart 23). This can be explained by the fact that the credit cycle (changes in loan quality) lags behind the economic cycle.

Persistently high (albeit shrinking) credit risk costs lead to a lasting deterioration of credit quality, which is reflected in rising loan loss provision ratios. Considerable regional differences can be observed both in the credit quality level and in how quickly and sharply credit quality deteriorates.

The Austrian banking sector's unconsolidated loan loss provision ratio<sup>2</sup>

Foreign currency loans stagnate at a high level

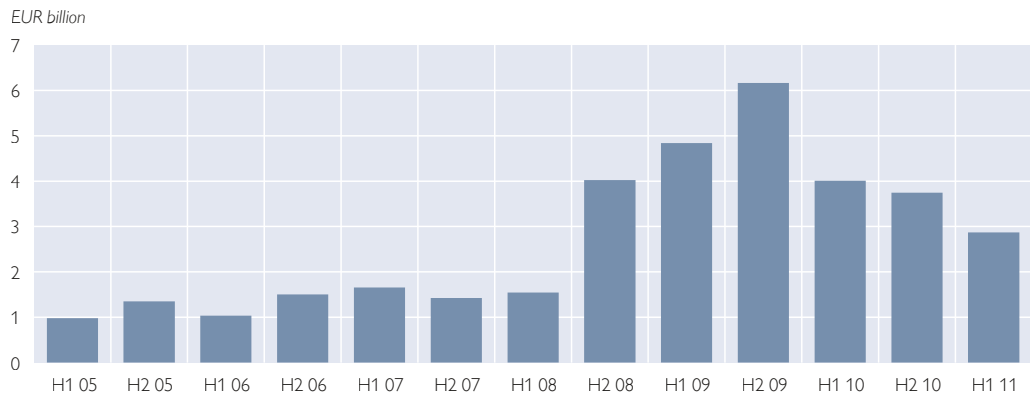
Deterioration in loan quality continued to slow down somewhat in the first half of 2011

<sup>1</sup> The funding gap denotes the difference between the capital that must be accumulated in the repayment vehicle to cover 100% of the loan at maturity and the forecast value based on the repayment vehicle's current market value and current yield assumptions.

<sup>2</sup> Specific loan loss provisions for claims on nonbanks as a share of total outstanding claims on nonbanks.

Chart 23

### Consolidated Credit Risk Costs of Austrian Banks



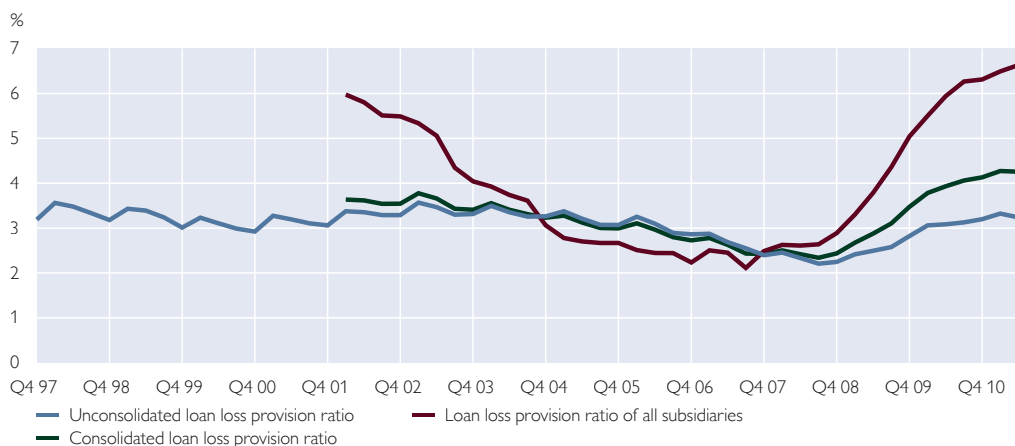
Source: OeNB.

– which does not cover foreign subsidiaries and is hence clearly focused on Austria – remained almost unchanged at 3.2% in the first half of 2011 (blue line in chart 24). By contrast, the loan loss provision ratio of all Austrian bank subsidiaries rose again sharply to 6.6% (red line in chart 24), up by 0.3 per-

centage points from end-2010, when it had slowed its growth. A breakdown by country groups<sup>3</sup> shows substantial regional differences, though: CIS –0.2 percentage points, NMS-2004 +0.6 percentage points, NMS-2007 +0.3 percentage points and SEE +0.4 percentage points.

Chart 24

### Loan Loss Provision Ratios of Austrian Banks



Source: OeNB.

<sup>3</sup> In this section, the following regions and country groups are reviewed: NMS-2004 refers to countries that joined the EU in 2004, here: Latvia (LV), Poland (PL), Slovakia (SK), Slovenia (SI), the Czech Republic (CZ) and Hungary (HU). Southeastern Europe (SEE) includes Albania (AL), Bosnia and Herzegovina (BA), Croatia (HR), Montenegro (ME), FYR Macedonia (MK), Serbia (RS) and Turkey (TR). NMS-2007 refers to the Member States that joined the EU in 2007: Bulgaria (BG) and Romania (RO). The Commonwealth of Independent States (CIS) aggregate covers Armenia (AM), Azerbaijan (AZ), Belarus (BY), Kazakhstan (KZ), Kyrgyzstan (KG), Moldova (MD), Russia (RU), Tajikistan (TJ), Turkmenistan (TM), Ukraine (UA) and Uzbekistan (UZ); Georgia (GE) is also included here.

The resulting consolidated loan loss provision ratio<sup>4</sup> covering the entire retail lending business of domestic banks both in Austria and abroad was 4.3% as at end-June 2011 (green line in chart 24) and thus 0.1 percentage points higher than at end-2010. In light of the deteriorating economic outlook, loan loss provision ratios are unlikely to decline in the near future.

The stock of loan loss provisions changes when new ones are made (inflows) or when they are used to cover bad debt or released (outflows). The ratio of inflows to outflows peaked in 2009 (unconsolidated: 2.4; foreign subsidiaries: 2.8), declined in 2010 (1.3 and 1.8, respectively), but started rising again recently for foreign subsidiaries.

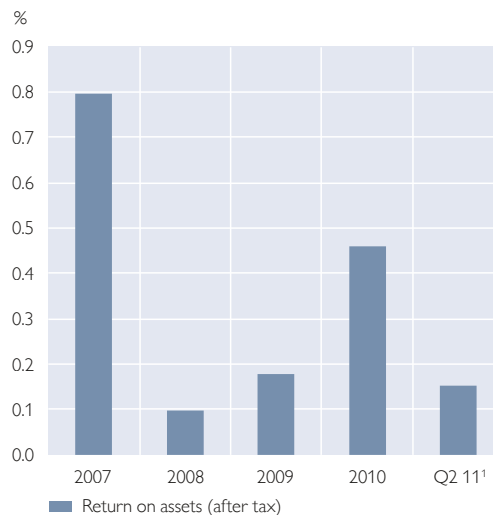
### Banks' Profitability Is Again Subdued

Following very favorable developments in the first half of 2011, the profitability of Austrian banks (consolidated data) weakened considerably from August 2011, which was attributable to the challenging market situation, the deteriorating macroeconomic outlook and the writedowns on government bonds. Based on the unconsolidated data reported as at end-June 2011, the annual surplus for the full year 2011 is estimated to be almost 60% lower than in 2010.

In the first half of 2011, the Austrian banks' consolidated operating income was around 1.5% higher than in the same period of 2010. This improvement can be traced to a rise in trading income by around EUR 700 million. The most important income components – net interest income (+1.2%) and fee-based income (–0.5%) – remained broadly unchanged at the levels

Chart 25

### Profitability of Austrian Banks (Consolidated)



Source: OeNB.

<sup>1</sup> The value for 2011 is an extrapolation as at end-June 2011 that takes into consideration published expected losses.

observed in the first half of 2010. Operating expenses (+3%) rose somewhat faster than operating income, above all because of an increase in staff costs and other operating expenses. As a consequence, the consolidated operating result of the Austrian banking system was around 1.3% lower in the first half of 2011 than in the same period of 2010. The cost-to-income ratio climbed from 57.7% (Q2 10) to 58.4% (Q2 11).

Credit risk costs declined in 2010 and continued to do so in the first half of 2011, reducing operating profits by around 58% in the financial year 2010 but only by 44% in the first half of 2011. This decline was again the main factor in improving the period result for the first half of 2011, which came to some EUR 2.9 billion and thus exceeded the results observed in the first half of both 2009 and 2010. The favor-

Market turmoil and government debt crisis subdue the high profitability observed in the first half of 2011

<sup>4</sup> The numerator of this ratio is the stock of unconsolidated specific loan loss provisions for claims on nonbanks plus the stock of specific loan loss provisions reported by fully consolidated subsidiaries. The denominator is the sum of unconsolidated gross claims on nonbanks and the gross claims of fully consolidated subsidiaries on nonbanks. The consolidated loan loss provision ratio is subject to some uncertainty, given regional differences in accounting rules.

Improved net interest income of CESEE subsidiaries despite stagnating efficiency

Austrian banks' CESEE exposure is well diversified

Increase in lending by CESEE subsidiaries reflects GDP developments in the region

able period result for the first half of 2011 can be expected to partly offset the marked decline in profitability observed from the third quarter of 2011. Still, for the full year 2011, the consolidated return on assets after tax is likely to be markedly lower than in 2010. Based on the data available at the cutoff date for data, Austrian banks' return on assets (RoA) is expected to come to between 0.1% and 0.2%.

### CESEE Exposure Has Increased Somewhat

In mid-2011, the exposure<sup>5</sup> of domestically controlled banks to CESEE stood at around EUR 225 billion.<sup>6</sup> While this exposure remains broadly diversified, the lion's share (57.4%) was to the NMS-2004, where political risk has increased again recently (in chart 26 the size of the circles corresponds to the exposure volume).

At end-June 2011, the 69 fully consolidated Austrian subsidiaries in CESEE posted total assets of around EUR 269

billion, which is a 1.5% increase year on year. During the same period, the volume of on-balance sheet loans rose by 2.8% to around EUR 173 billion, thus continuing a development that had started already at the end of 2010.

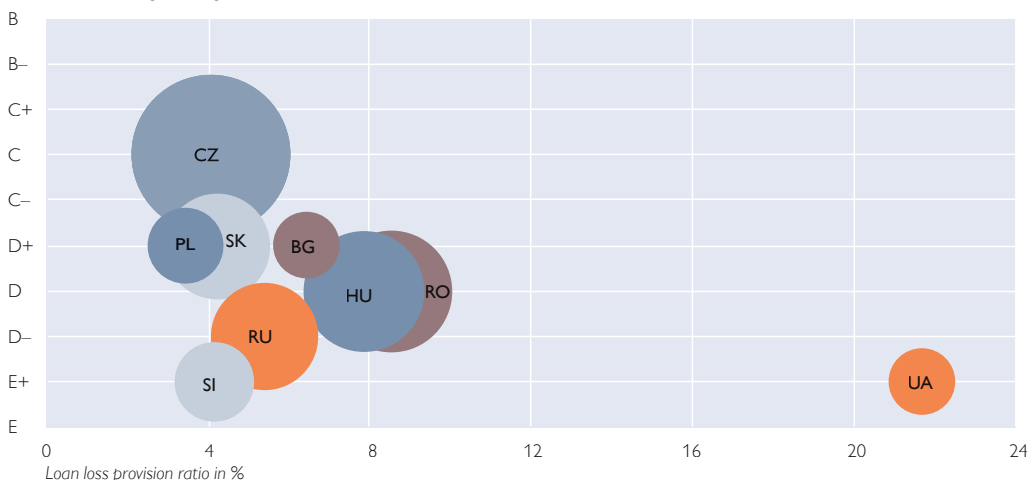
Operating income of Austrian banks' subsidiaries in CESEE was around EUR 7.0 billion at end-June 2011, which represents an increase by 5.3% year on year. Net interest income, which rose by 3.1%, accounted for the bulk of operating income. The three other items (fee-based income, trading income and other operating income) also contributed positively to operating income. Operating expenses increased more sharply (+7.0%) than operating income, which caused the cost-to-income ratio to deteriorate somewhat from end-June 2010. In the second quarter of 2011, the ratio stood at 49.0% (see chart 27).

The period profit of about EUR 1.6 billion posted by Austrian banks' CESEE subsidiaries at June 2011 again under-

Chart 26

### Country Risk Exposure in CESEE

Bank Financial Strength Rating



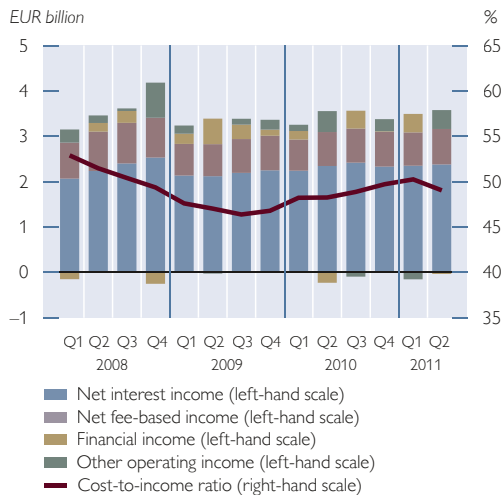
Source: OeNB (Q2 11), Moody's (November 2011).

<sup>5</sup> Here, exposure refers to the exposure of majority-owned Austrian banks to credit institutions and nonbanks in CESEE.

<sup>6</sup> At the same time, these banks held customer deposits of about EUR 116 billion.

Chart 27

### Composition of CESEE Subsidiaries' Operating Income



Source: OeNB.

scored the importance that business activities in CESEE have for domestic banks. In addition, the subsidiaries' RoA after taxes, at 1.2 %, was clearly higher than the return on assets of domestic business. The same is true for the return on equity (RoE) after taxes, which, in mid-2011, was considerably higher in the Austrian banks' CESEE subsidiaries (11.2%) than in Austria (5.2%). Both indicators had increased markedly from June 2010. Compared with the unconsolidated results (which are dominated by the domestic business), Austrian banks' CESEE business is again more profitable but also entails higher credit risks. At end-June 2011, the CESEE subsidiaries' loan loss provision ratio came to 6.8%, which was more than twice as high as the unconsolidated rate (3.2%). Recent financial policy measures, e.g. the Hungarian government's intervention in foreign

currency loan contracts or the introduction of a banking tax in Hungary and later in Slovakia, as well as deteriorating economic conditions are set to cause profitability in CESEE to decline in the short to medium term.

In spring 2010, the FMA and the OeNB published Guiding Principles to limit new foreign currency lending by Austrian banks' CESEE subsidiaries. The banks in question continued to comply with these principles in the second half of 2011, as they had done at end-2010. In a first step, the principles require banks to refrain from extending highly risky types of foreign currency loans, e.g. Swiss franc loans to unhedged households or unhedged small and medium-sized enterprises, or consumer loans denominated in euro to households with a low degree of credit-worthiness. Mortgage loans denominated in euro have not been addressed so far, given that local capital markets are not yet fully developed. At the international level, the "Vienna Plus" initiative, which was launched jointly with the European Bank for Reconstruction and Development (EBRD) in March 2011 to promote the development of local currency capital markets, also issued recommendations for limiting new foreign currency lending, which are broadly consistent with those of Austria's Guiding Principles.<sup>7</sup> In addition, in spring 2011, the newly founded European Systemic Risk Board (ESRB) established a working group to identify the risks specific to foreign currency lending and prepare recommendations on how to handle these risks at the EU level. The recommendations were published in September 2011.<sup>8</sup>

Measures to limit new foreign currency lending remain a priority for supervisors...

Profitability of Austrian banks' CESEE business improves despite higher loan loss provision ratios

<sup>7</sup> The executive summary of the report drawn up by the Local Currency and Capital Markets Working Group is available at <http://www.ebrd.com/pages/news/press/2011/110408a.shtml> (retrieved on November 18, 2011).

<sup>8</sup> The ESRB's recommendations are available at <http://www.esrb.europa.eu/pub/pdf/recommendations/ESRB-2011-1.pdf?e669fd3a89bc20be364fb5c569f36ed7> (retrieved on November 18, 2011).

Chart 28

... as the stock of foreign currency loans has stagnated at a high level

Owing to regulatory measures taken by supervisory authorities in Austria and in CESEE countries, Austrian banks' subsidiaries in CESEE essentially stopped granting new loans denominated in Swiss franc. As a result, the stock of these loans declined by 5.8% in the first half of 2011 compared to six months earlier. With a volume of EUR 15.8 billion, Swiss franc loans still accounted for around one-fifth of all foreign currency loans granted by the CESEE subsidiaries of Austria's "top six"<sup>9</sup> banks to households and nonfinancial corporations. Overall, new foreign currency lending contracted significantly in compliance with the Guiding Principles the banks had committed themselves to. The share of foreign currency loans in total loans hence declined somewhat to 45.8%. As in the past, the euro was the dominant foreign currency, accounting for 59.4% of foreign currency loans in the region. Similar developments were observed for cross-border foreign currency loans to CESEE borrowers: As shown in chart 28, the total volume of such loans increased slightly to EUR 39.0 billion (1.8%), whereas the volume of direct loans denominated in Swiss franc declined by 7.9% to EUR 2.4 billion.

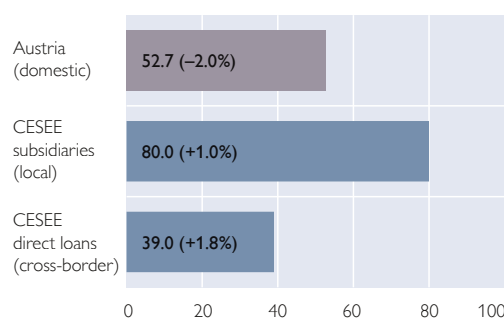
Intragroup liquidity transfers remain significant

Credit risk still elevated due to foreign currency lending

Country-specific differences notwithstanding, in mid-2011, the credit quality of foreign currency loans was again lower than that of local currency loans in mid-2011. The nonperforming loan ratio (NPL ratio) of foreign currency loans was 17.5% on a CESEE average, and thus higher than that of total loans (14.1%), where both ratios had again increased over time. Compared

### Austrian Banks' Foreign Currency Loan Exposure to Households and Nonfinancial Corporations

EUR billion (change on Q2 10 in %)



Source: OeNB.

Note: As at Q2 11. Growth rate adjusted for exchange rate effects.

with local currency loans, foreign currency loans not only became nonperforming more often but were also to a lesser extent covered by risk provisions. As regards credit claims overall, the NPL coverage ratio II<sup>10</sup> stood at 72.8% in June 2011; in the case of foreign currency loans, it was only 62.5%.

Another risk-relevant feature of Austrian banks' CESEE exposure is that intragroup liquidity transfers are of considerable importance for numerous subsidiaries. Such transfers came to EUR 48.3 billion at end-June 2011, which was reflected in a loan-to-deposit ratio (LDR) of 108.3% on average in CESEE. The results for the individual countries are highly heterogeneous, though. Low local deposit volumes can cause CESEE subsidiaries to become even more dependent on their parent banks, especially in times of crisis. The LDR has remained unchanged since the end of 2010, however, and the rise in the volume of intragroup liquidity transfers can be largely

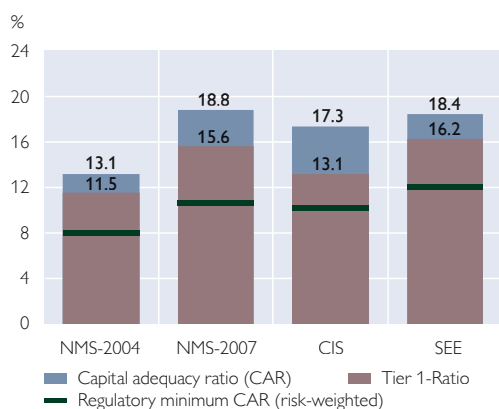
<sup>9</sup> The "top six" banks comprise Austria's six banking groups with the largest exposure to the CESEE region (in terms of external assets). Between end-2008 (when the subsidiaries' foreign currency loan exposure peaked) and mid-2011, the Swiss franc firmed by 18.7% against the euro. This alone resulted in estimated book value losses of around EUR 4.5 billion, of which 80% were related to Swiss franc loans to households.

<sup>10</sup> NPL coverage ratio II = (risk provisions on nonperforming loans + collateral according to Basel II) / NPLs.



Chart 29

### Capitalization of CESEE Subsidiaries (Q2 11)



Source: OeNB.

attributed to structural breaks in the data reported to the Central Credit Register in the first quarter of 2011.

In the first half of 2011, the CESEE subsidiaries' capital situation improved in all regions year on year. The ratios exceed the regulatory minimum re-

quirements in all countries under review, in some of them considerably (see chart 29). This holds true both for the capital adequacy ratio and the tier 1 ratio, with the former climbing to 15.8% on CESEE average and the latter rising slightly to 13.4% as at end-June 2011. While the tier 1 ratio came to 11.5% in the NMS-2004, it was (in part markedly) higher in the three other regions (NMS-2007, CIS and SEE), reflecting higher regulatory capital minimum requirements in some countries but also elevated country risk.

While the tier 1 capital ratio of Austria's "top three" banks has increased over time (consolidated data), it still remains below the tier 1 ratio of 12 European peers which also have a sizable CESEE exposure, even though the Austrian banks have a higher exposure to CESEE (see chart 34). Therefore, the recent initiatives to raise Austrian banks' capitalization are welcome measures.

Tier 1 ratio increases on a consolidated basis but still remains below European peers

CESEE subsidiaries' capital situation continues to improve

Box 2

### Austrian Supervisors Present Measures to Strengthen the Sustainability of the Business Models of Internationally Active Large Austrian Banks

In November 2011, the OeNB and the Austrian Financial Market Authority (FMA) presented a principle-based set of measures that aims at strengthening the sustainability of the business models of the three largest internationally active Austrian banking groups. The measures will be issued as supervisory guidance to the concerned banks in early 2012. The guidance is based on the following three pillars of sustainability-enhancing measures:

1. The banking groups concerned have to further strengthen their capital base so as to improve their (long-term) risk-bearing capacity. Specifically, the Basel III rules on common equity tier 1 (CET 1) capital will be fully implemented from January 1, 2013, without making use of any transitional provisions (7% CET 1,<sup>1</sup> but including the participation capital subscribed under the bank support package). From January 1, 2016, these banking groups will be required to hold an additional variable CET 1 capital buffer of up to 3 percentage points, depending on the riskiness of their business model.
2. The foreign banking subsidiaries of the addressed banking groups must strengthen the independence and stability of their funding base in order to improve the sustainability of their future lending growth. To this end, particularly exposed foreign banking subsidiaries<sup>2</sup> must make sure that the volume of net new loans to nonbanks does not exceed the growth in stable funding<sup>3</sup> by more than 10%. This measure includes flexibility clauses for smaller subsidiaries and for exceptional circumstances.

<sup>1</sup> Effectively, this includes the 4.5% CET 1 minimum requirement and the 2.5% CET 1 capital conservation buffer.

<sup>2</sup> This requirement applies only to those subsidiaries where the ratio of loans to nonbanks to stable funding exceeds 110% in the stock.

<sup>3</sup> Including deposits from nonbanks, supranational funding, third-party capital, as well as the outstanding volume of debt securities with (original) maturities of one year or more that were issued by the subsidiaries to investors outside their consolidated banking group.



3. The banking groups have to submit recovery and resolution plans before the end of 2012 to prepare themselves and the supervisory authorities for potential crisis situations. This balanced set of measures aims at strengthening financial stability both in Austria and in the host countries (above all in CESEE). It will promote sustainable growth and help avoid pronounced boom-bust cycles, thus strengthening the three Austrian banking groups' conservative and retail-focused business models.

### European Banks Face Funding Difficulties

Austrian banks have been affected by the very difficult liquidity situation in Europe. Since July 2011, transaction volumes have been rather low in the unsecured euro money market, the market for unsecured euro bank bonds and U.S. dollar funding markets. The respective spreads, too, are at historically high levels.

These developments can be partly attributed to the high uncertainty surrounding the European government debt crisis, the resulting change in investors' risk assessment of the banking sector and the high volatility in capital markets as well as the uncertain economic outlook. While these factors are, in principle, temporary, long-term structural changes have also played a role. As a result of the government debt

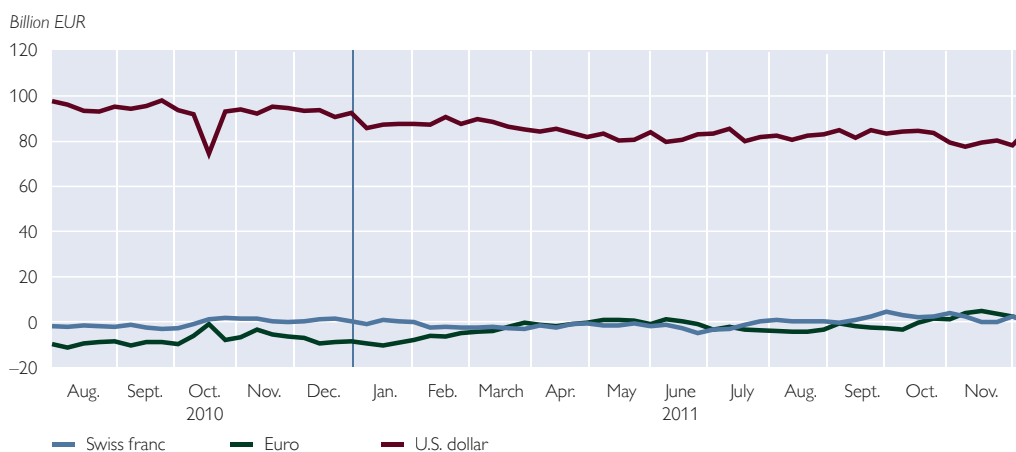
crisis, the discussion about bank insolvency laws and the banks' role in restructuring Greek government bonds, investors have lost confidence in the implicit government guarantees for bank bonds. While the abolishment of the implicit government guarantee for banks is a long-term goal of international regulatory reforms, it explains the sobering situation in the market for unsecured bank bonds in the short and medium term.

In response to the turmoil in funding markets, Austrian banks substantially reduced their liquidity risks (above all for maturities of up to 1 month), stepped up the competition for deposits and lowered their funding needs. As at November 11, 2011, the aggregate net position of reporting banks in the unsecured money market was positive at around EUR 1.4 billion

Competition for deposits

Chart 30

### Cumulated Counterbalancing Capacity (Up to 1 Month, Before Unsecured Money Market)



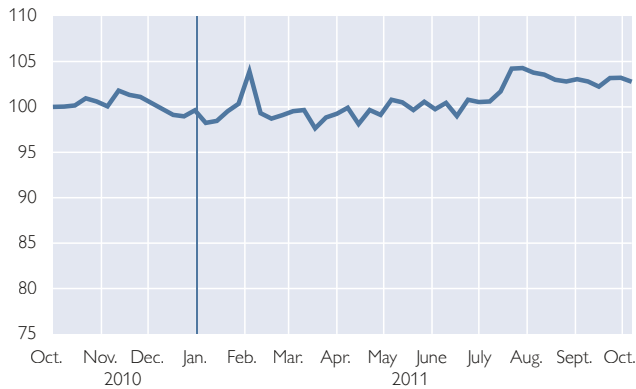
Source: OeNB.

Chart 31

## Liquidity Conditions in the Austrian Banking System

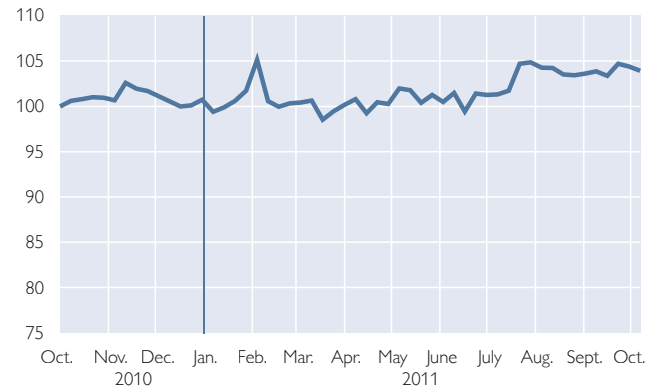
### Expected Capital Inflows

Index: October 22, 2010 = 100



### Expected Capital Outflows

Index: October 22, 2010 = 100



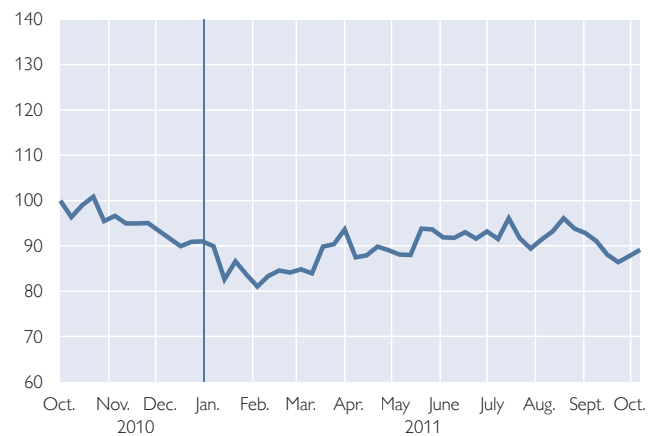
### Cumulative Net Funding Gap (After 12 Months, Before Unsecured Money Market)

Index: October 22, 2010 = 100



### Cumulative Additional Counterbalancing Capacity (After 12 Months, Before Unsecured Money Market)

Index: October 22, 2010 = 100



Source: OeNB.

in the maturity band of up to 1 month. The Austrian banking system's medium-term liquidity situation, too, is stable: In a simple stress test with a time horizon of 12 months, it was assumed that both the unsecured money markets and the foreign currency swap markets would dry up completely and that wholesale and retail deposits would decline by almost 10%. In addition, it was assumed that only around 50% of the long-term debt securities issued could be rolled over. Under these assumptions, the Austrian banks' cumulated counterbalancing capacity (liquid-

ity buffer across all currencies) was still almost EUR 83 billion after 12 months. The liquidity buffers in the most important foreign currencies, U.S. dollars and Swiss francs, were satisfactory in the maturity band of up to 1 month, despite the assumption that all foreign currency swaps would be discontinued. In response to the tensions in U.S. dollar funding markets that emerged in Europe in August 2011, Austrian banks built up additional liquidity buffers in U.S. dollars. As a result, the banks' cumulated counterbalancing capacity has been positive both in the short-term

band (EUR 2.8 billion, maturities of up to 1 month) and in the longer-term band (EUR 2.0 billion, maturities of up to 12 months) since September 2011, which is a first since the introduction of liquidity reporting in Austria.

This means that banks currently need to focus on restoring investor confidence in unsecured bank bonds by raising capital ratios (in line with the EU decisions of October 26, 2011, among other things), increasing liquidity buffers as well as improving transparency. These steps – in combination with the implementation of new liquidity standards (the liquidity coverage ratio, LCR, and the net stable funding ratio, NSFR) through amendments to the Capital Requirements Directive

(CRD IV) and the Capital Requirements Regulation (CRR) – will ensure more economically adequate pricing of liquidity (risk) and of bank loans. As a result, the allocation of capital in Austria will become more efficient, as investment projects that only generated a positive net cash value because the cost of loans was too low and because interest margins were too low to cover liquidity risk costs will no longer be realized. New pricing of bank bonds in the long run will therefore prompt changes in banks' business models and in the financing choice of large companies. A rising number of companies will obtain funding from capital markets; in Austria, this trend is limited, though, given the large share of SMEs.

Box 3

#### The Role of Short-Term Wholesale Funding for Austrian Banks

*During the financial crisis, the strong and opaque connections between banks proved to be one of the major problems for counterparties, investors and supervisors in assessing the risks of credit institutions and the entire banking system. The increased build-up of short-term interbank liabilities played a crucial role in some international banks' rapid total asset growth, which in turn contributed to contagion effects when confidence was dwindling in the interbank market after the onset of the crisis. In 2008, investment banks like Bear Stearns and Lehman Brothers were hit particularly hard: Within just a few days, they were cut off from interbank funding sources. The severe liquidity crunch resulted in the takeover of Bear Stearns by another bank, while Lehman Brothers had to file for bankruptcy protection. These events quickly affected other financial institutions and money market funds and drastically intensified the financial crisis; the effects of which are still reverberating around the world.*

*The analysis of the importance of short-term wholesale funding for Austrian banks is based on financial accounts data adjusted for certain structural features of the Austrian banking system. Specifically, the data on decentralized sectors and their multiple tiers artificially inflate the share of their wholesale funding; a distortion, which needs to be addressed. Therefore, only deposits and debt securities with short maturities<sup>1</sup> held in the interbank market, but which were not held in the same multi-tiered sector,<sup>2</sup> were counted toward short-term wholesale funding instruments.<sup>3</sup> At end-June 2011, these types of funding accounted for around 8% of Austrian banks' total financial liabilities (excluding equity capital), which is roughly the same share as the one recorded at the end of 2007. Including cross-border interbank deposits (also by a bank's own foreign subsidiaries or branch offices), the share came to 17.4% at the end of June 2011. Even though the available data on linkages to foreign interbank market participants is thus less granular and includes intragroup transactions, these results highlight the relatively low importance of volatile, short-term wholesale funding in the refinancing of Austrian banks (also because the role of investment banking is rather insignificant for them).*

<sup>1</sup> With original maturities of up to 12 months.

<sup>2</sup> Transactions within the same multi-tiered sector are not considered wholesale funding.

<sup>3</sup> Unfortunately, the supervisory statistics do not include data on the maturity of deposits. Therefore, all deposits were included, as they were assumed to be of a short term nature.

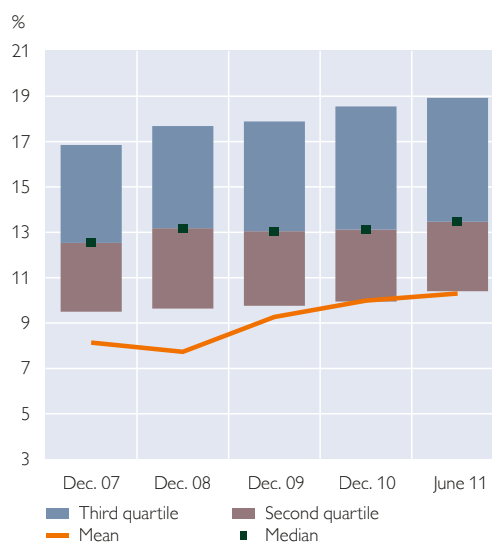
### Capital Adequacy Continues to Improve in 2011

After its low in the third quarter of 2008, the aggregate tier 1 capital ratio (capital adequacy ratio) of all Austrian banks rose continually, gaining around 300 (303) basis points to 10.3% (13.5%) in the second quarter of 2011. The increase in the aggregate tier 1 capital ratio was essentially traceable to two factors:

First, the volume of eligible tier 1 capital grew by 34% from the third quarter of 2008, reflecting government measures under the bank rescue package worth EUR 6.1 billion as well as internal capital increases (private placements, capital injections from the parent group, retained earnings and other measures) in the amount of EUR 10.9 billion.

Second, banks sharply reduced risk-weighted assets until the fourth quarter of 2009 (see chart 32), which can be considered a direct response to the finan-

Chart 33  
Development of Aggregate Tier 1 Capital Ratio of Austrian Banks



Source: OeNB.

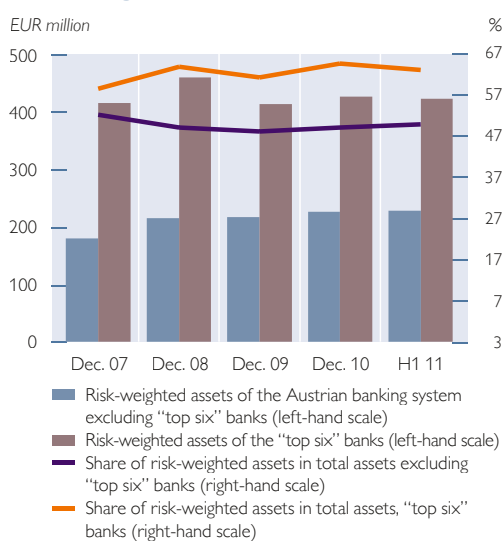
Capitalization of large banks remains below average

cial crisis. This reduction was mainly achieved by balance sheet streamlining, but also e.g. by lowering new lending and cutting off-balance sheet activities. While risk-weighted assets were still on the rise in 2010 (+2.9% compared with end-2009), they declined slightly by 0.7% until mid-2011.

At the end of June 2011, the median tier 1 capital ratio of all Austrian banks was 13.5% and thus above the aggregate average (see chart 33). The difference between the two metrics results from the structure of the domestic banking system, which features a large number of small regional banks with above-average capitalization alongside the dominant large banks. Half of all Austrian banks (the second and third quartile) post tier 1 capital ratios between 10.4% and 18.9%.

The aggregate tier 1 capital ratio, i.e. the mean ratio weighted by RWA,<sup>11</sup> is dominated by the country's "top six"

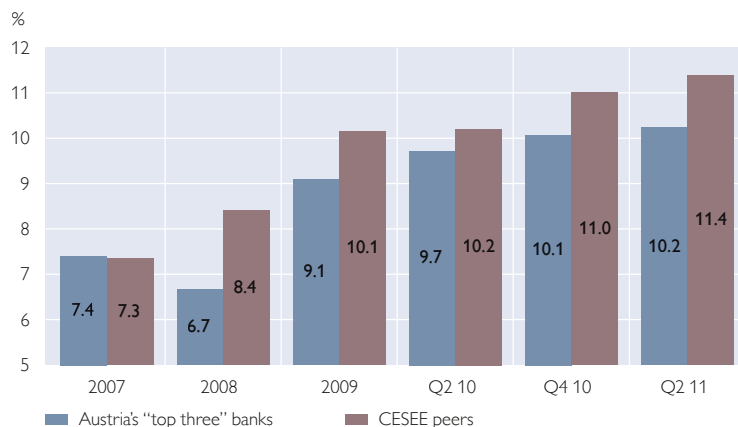
Chart 32  
Risk-Weighted Assets at Austrian Banks



Source: OeNB.

<sup>11</sup> RWA: Risk-weighted assets.

## Tier 1 Capital Ratios of Austrian Major Banks with a CESEE Focus



Source: OeNB.

## Further capital increases required

banks. An international comparison of tier 1 capital ratios shows, however, that the Austrian major banks (9.8% on average) are less adequately capitalized than their international peers<sup>12</sup> (11.4% on average)(see chart 34).

Even though the major Austrian banks improved their tier 1 capital ratios in recent years, the gap between them and their peers has ultimately widened, as the latter strengthened their ratios even more than the Aus-

trian banks did. This gap between the “top six” Austrian banks and their peers widened from 1.1 percentage points in 2009 to 1.6 percentage points as at June 30, 2011.

Austrian banks are well advised to further increase their capital ratios in light of the facts outlined above, the change in the credit cycle, higher capitalization requirements due to current regulatory plans and crisis measures at the European level.

Box 4

## Does Excessive Deleveraging Counteract the Advantages of Recapitalizing European Banks?

At the Euro Summit on October 26, 2011, the European Council agreed on a comprehensive set of measures to address the deepening sovereign debt crisis in the euro area. This set of measures consists of three pillars: 1) the expanded European Financial Stability Facility (EFSF) for market interventions and as a backstop for bank recapitalization, 2) the refinancing guarantees for banks, and 3) the plan to improve the quality and quantity of the large cross-border banks' capital.<sup>1</sup> These measures are aimed at breaking the vicious circle of the banking and sovereign debt crisis. However, critics fear that the banks will meet the higher capital requirements by resorting to excessive deleveraging, i.e. by reducing borrowed capital while at the same time reducing their assets. Such measures could cause the growth rate of lending to the real economy to contract.<sup>2</sup> This, in turn, would present companies – above all, small and

<sup>1</sup> See the Euro Summit Statement of October 26, 2011 (item 17 and Annex 2).

<sup>2</sup> See the Bank of England's Financial Stability Report, issue no. 30 of December 2011 and the IIF Policy Letter to the Group of Twenty Summit in Cannes of November 2011.

<sup>12</sup> This group comprises the following banks that are active in the CESEE region: Banco Santander S.A., Bayerische Landesbank, Commerzbank AG, ING Bank N.V., Intesa Sanpaolo, KBC Bank N.V., National Bank of Greece S.A., OTP Bank Plc., Skandinaviska Enskilda Banken AB, Société Générale, Swedbank AB.

medium-sized companies – with refinancing problems. If companies cannot refinance themselves, they will default on loans – and this would weaken banks even more.

#### **Reduction of Excessive Debt and Balance Sheet Repair**

In the past, the OeNB welcomed the moderate deleveraging process that Austrian banks had embarked on from 2008;<sup>3</sup> in fact, lending to nonfinancial corporations and households is in fact low, representing only just over 60% and only 50%, respectively, of the aggregate total assets of Austrian or European large banks.<sup>4</sup> Thus banks definitely have the scope to reduce the size of their balance sheets without endangering the level of lending to the real economy. Deleveraging could operate through the reduction of interbank positions and securities in the trading book, or through the reduction of unsecured consumer lending without affecting the refinancing of nonfinancial corporations. The most recent monthly data on new and outstanding loans confirms this development, at least in Austria: the annual growth rate of lending to companies stood at 2.2% in the third quarter of 2011, the highest value in nearly two years. Even the sale of credit exposures, e.g. in Asia<sup>5</sup> or, as some banks announced, in Europe as well, merely led to a transfer of assets that in the end has no impact on the refinancing of the real economy.

In Europe, too, the economic crisis was partly triggered by excessive lending at interest rates that were too low, e.g. lending for projects that only apparently had a high net cash value, because the interest margins were too low to cover risk costs. If the banks had taken realistic risk costs into account and had extended such loans at higher rates of interest, many of these projects would have had a negative cash value. Hence, implementing these projects was inefficient and resulted in a misallocation of capital. Consequently, high lending growth at low rates of interest did not contribute to sustainable growth, but to excess capacities and excessive debt in particular sectors, such as the construction industry in Spain or Ireland, and to excessive household debt. In the case of lending to households, banks imported capital that was not invested productively but that was rather allocated to consumer lending, contributing to persistent current account deficits.<sup>6</sup> The subsequent orderly deleveraging becomes apparent in the decrease in loan demand resulting from the ample availability of funding of individual sectors. Therefore, deleveraging as an economic policy goal is to be considered a contribution to structural adjustment and to the long-term stability of the real economy. Numerous large nonfinancial corporations are currently finding it cheaper than banks are to refinance themselves in the money and capital markets. This circumstance is partly attributable of the current crisis, but partly, it also has long-term structural causes, such as the implementation of bank insolvency law that has done away with the implicit government guarantee for loans. With interest rates so low, nonfinancial corporations now have the chance to seek funding directly in the market, and banks have the chance to expand their lending to small and medium-sized enterprises.

The deterioration of average credit quality in many European banks' lending books was also a sign of capital misallocation. As annual lending is significantly lower than the amounts of credit outstanding, the average quality of new loans must be substantially higher than that of loan stock for average credit quality to improve. The need to shore up average credit quality explains why lending standards have been tightening since 2008.<sup>7</sup>

All of these deficiencies have become all the more apparent in European banks' tightening refinancing conditions since mid-2011: Investor trust in European banks has dwindled in light of the European sovereign debt crisis and the steadily worsening economic outlook. As a large volume of unsecured bonds will have to be refinanced in 2012, the tight refinancing conditions in Europe could in fact result in excessive deleveraging. Restoring confidence and thus

<sup>3</sup> See e.g. the OeNB's Financial Stability Report 21 of June 2011 (p. 37).

<sup>4</sup> Based on data published within the framework of the stress test conducted by the EBA in 2011, on- and off-balance sheet exposures excluding commercial real estate.

<sup>5</sup> See e.g. press release 0357 of Austria Presse Agentur (APA) of December 2, 2011.

<sup>6</sup> Bergin, P. (2011). Asset price booms and current account deficits. FRBSF Economic Letter 37, December 5.

<sup>7</sup> See the Eurosystem's bank lending survey of October 2011.



*securing access to the bond markets is the very purpose of bank recapitalization, along with improving the quality of loans in banks' portfolios. Until now, the deleveraging process has been a gradual and sensible one by economic policy standards and has been warranted from the real economy perspective. In the next few months, it will also be important that this deleveraging process does not accelerate too fast, considering that the new capital standards will already apply mid-2012.*

*Overall, the advantages of recapitalizing European banks outweigh the potential negative repercussions: Without recapitalization, there would be a lack of funding, which could result in even greater deleveraging by banks.*

### **Market Assessment of Austrian Financial Institutions Worsens Markedly**

As the euro area government debt crisis intensified, the external assessment of Austria's credit institutions deteriorated markedly in line with overall market developments of European financial stocks. The stock prices of listed Austrian banks declined sharply from August 2011, thus losing most of the ground they had gained since March 2009.

The favorable market assessment observed in the first half of 2011 reflected above all the comparatively low exposure of Austrian banks to euro area countries with an IMF/EU program as well as the fact that growth rates in CESEE were higher than in Western Europe. Given the negative market sentiment about countries and banks in the euro area, contagion effects increasingly spread to financial markets in CESEE in the second half of 2011, affecting also their growth outlooks. The materialization of country-specific political risks in CESEE – like the massive devaluation in Belarus or the Hungarian government's measures addressing foreign currency lending – was another factor that put pressure on Austrian banks.

In addition, price-to-book value ratios have declined to below 1, which implies a negative market assessment of the outlook for Austrian financial insti-

tutions. The market assessment of Austrian banks' stocks thus worsened with a small delay after that of other European financial stocks. Listed Austrian banks are particularly affected by this development, as their capital adequacy is below average both in terms of quantity and quality, and the changed sentiment makes it harder for them to improve their risk-bearing capacity through the market. This goes to show that windows of opportunity – when market conditions are favorable – should be used when they occur. An improvement in Austrian banks' capital adequacy would also have a positive impact on their stand-alone ratings (without government support).

### **The Market Environment for Other Financial Intermediaries Deteriorates**

#### **European Insurance Industry Faces Challenges**

While the European insurance industry coped relatively well with the financial crisis of 2008 and 2009, it is facing substantial challenges owing to the government debt crisis and the low interest rate level. The assets of insurance companies, which are significant investors, have taken a hit as a result of falling government bond, bank bond and stock prices. Premium growth can be expected to stagnate, given the lower growth forecasts for Europe.

In the first half of 2011, premium growth in the Austrian insurance sec-

Lower profit expectations impact market assessment



tor declined by 7.6% year on year, which was mainly ascribable to a sharp decrease in single-premium life insurance payments (–33%), which, in turn, can be explained by a change in tax treatment. Divergent developments were observed in the other indicators: The industry’s return on investment climbed to 4.7%, up by 0.7 percentage points year on year, reflecting quite favorable financial market developments in the first half of 2011 and the slight rise in the interest rate level. In the second quarter of 2011, the expense ratio came to 21.3%, up by 1.4 percentage points year on year, while the claims ratio was 73.7%, which is an increase by 6.1 percentage points year on year. In light of the marked deterioration in financial markets in the second half of the year, expectations are low regarding the annual result for 2011.

The OeNB’s securities holdings statistics, which comprises all securities holdings by Austrian insurance companies (including unit- and index-linked life insurance plans), show that domestic insurers held securities worth EUR 72.8 billion in the second quarter of 2011. Government bonds<sup>13</sup> accounted for EUR 17 billion of this sum, while securities of domestic and foreign banks accounted for EUR 32.8 billion. Austrian insurance companies had an exposure of EUR 6.7 billion<sup>14</sup> to countries with higher risk premiums (Greece, Ireland, Italy, Portugal and

Spain), with investments in government bonds coming to EUR 2.6 billion and investments in bank bonds amounting to EUR 2.5 billion.

The main risks for the Austrian insurance industry are the potential intensification of the sovereign debt crisis and a prolonged period of low interest and yield levels (for products with a guaranteed minimum yield). An analysis of the specific risks of Austrian insurance companies in CESEE is provided in “The Austrian Insurance Industry in CESEE: Risks and Opportunities from a Financial Stability Point of View”<sup>15</sup>.

#### Mutual Funds Post Price Losses

In August 2011, total assets under management in Austrian mutual funds came to EUR 140.8 billion, down by almost 5% since the beginning of the year. This decline was above all due to price losses. Performance decreased markedly across all asset classes, and the share of specialized funds (institutional investors) continued to increase. Private investors remained cautious in light of uncertainty in financial markets, and tended to invest in products that offer deposit guarantees. The imminent implementation of UCITS IV<sup>16</sup> is another step toward harmonizing the mutual funds industry at the European level, which is expected to lead to a consolidation of mutual funds in Austria in the medium term.

Government debt crisis creates challenges for the insurance industry

Mutual fund assets decline

Insurance companies hold significant investments in bank and government bonds

<sup>13</sup> Including securities issued by provincial and municipal governments.

<sup>14</sup> Spain: EUR 1.9 billion, Greece: EUR 0.4 billion, Italy: EUR 2.6 billion, Ireland: EUR 1.5 billion, Portugal: EUR 0.3 billion.

<sup>15</sup> See the studies section of this issue.

<sup>16</sup> Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS).

### Exchange-Traded Funds (ETFs)

ETFs are mutual funds that are traded on stock exchanges and are usually managed passively. Because they are exchange traded, ETFs are considered more liquid than shares of other mutual funds; another perceived advantage is that they can be valued at any time and that their passive investment style is keeping their management costs low. To date, ETFs have attracted around USD 1,200 billion in worldwide investor assets; around two-thirds of which were sold in the U.S.A. The European market is still relatively small, but is expanding rapidly, with growth rates of around 40% p.a. over the past ten years. Market concentration is high, as six ETF sponsors dominate around 80% of the market.<sup>1</sup>

There are different types of ETFs: physical (“plain vanilla”) and synthetic. While physical ETFs replicate an index by actually purchasing and holding its constituents, synthetic ETFs are essentially a promise to deliver an index return by entering into a swap contract with an investment bank. The ETF sponsor pays the investment bank a fee in cash and in return receives collateral assets that are not necessarily connected to the index the ETF tries to replicate. The ETF sponsor then enters a total return swap with the investment bank, in which the returns on the collateral assets are swapped for the returns of the reference index. While synthetic replication helps reduce transactions costs incurred with physical ETFs and minimizes the tracking error, it entails the following substantial risks:

- Synthetic ETFs involve a high counterparty credit risk. The ETF sponsor pays the investment bank in cash and in return receives potentially illiquid collateral assets that are not necessarily connected to the reference index. Therefore, if the swap counterparty defaults, the collateral may not deliver the promised index return.
- Especially when the market environment is difficult and large outflows are recorded from ETFs, this source of investment banks’ funding may dry up, which may have a negative impact on investment banks’ liquidity situation.
- The impact of ETF trading on the market, especially in connection with high frequency trading, must not be underestimated. ETFs can have a strong influence on the liquidity of individual assets, and the assumed liquidity can dry up quickly under stressed market conditions.

While physical ETFs are in general solid products, credit risk can be considerable too, given the potentially very high share of securities lending (up to 80%).<sup>2</sup>

ETF structures are evolving constantly, and the complexity of new products is growing (e.g. leveraged ETFs, inverse ETFs and inverse leveraged ETFs). In these market segments, sound risk assessment is difficult for both investors and regulators.

The risks of synthetic ETFs have already been highlighted by the Bank for International Settlements, the International Monetary Fund and the Financial Stability Board, among others. The European Securities and Markets Authority published a Discussion Paper that calls for stricter regulations of ETFs in Europe. The paper addresses above all the following issues: introducing limitations on the distribution of synthetic ETFs to retail investors, requiring ETFs to provide information about the quality and amount of collateral posted, regulating the terms and amount of securities lending more stringently, reducing the use of strategy indices, and implementing other transparency-increasing measures.

<sup>1</sup> The ETF sponsor is the company that sets up and manages the ETF.

<sup>2</sup> The maximum percentage share depends on local legislation.

### Severance funds and pension funds post a worse performance

#### Pension Funds and Severance Funds Face Persisting Challenges

At end-June 2011, total assets under management in Austrian pension funds came to EUR 14.6 billion, which represents a decline by 2.7% since the begin-

ning of the year. In 2011, unfavorable financial market developments weighed on the investment performance of Austrian pension funds, which declined by 3.9% in the first three-quarters of the year according to the Oester-

reichische Kontrollbank. The annual result for 2011 will reflect this trend, as financial markets tensions are persisting, and total assets invested by pension funds will decline or stagnate despite continued inflows. The exposure of Austrian pension funds to countries with higher risk premiums (Greece, Ireland, Italy, Portugal and Spain) was around EUR 1.1 billion, with Italy accounting for more than one-half of this sum and Greece accounting for EUR 50 million.<sup>17</sup>

The number of pension funds in Austria will drop from 17 to 16 in 2012. The Austrian Federal Economic Chamber plans to outsource its own single-employer occupational pension fund to a multi-employer occupational pension fund; in addition, it will have to make an additional payment of between EUR 88 million and EUR 108 million.<sup>18</sup> Structural issues make it necessary to completely overhaul Austria's pension fund legislation; a bill to amend the legislation has already been<sup>19</sup> drawn up. The amendment provides for more competition, the right of prospective beneficiaries to select from among a variety of investment strategies, safety from insolvency and from creditors because the contributions are put into an investment and risk-sharing group, a guaranteed initial pension and a strengthening of the right to information. Furthermore, the Company Pension Act is to be amended: The vesting period (period after which employees become entitled to pension benefits)

will be reduced, and employees will be given the option of switching from one system to another. From the financial stability perspective, these measures are to be rated as positive. However, the amendment should also address problems with the incentive structure in managing pension funds.

Severance funds again posted significant asset growth, as they are still being built up. At the end of the second quarter of 2011, the sum total of accrued severance benefits came to EUR 3.9 billion, which is an increase by 23% compared to one year earlier. No investment performance data are available during the year, but the annual results for severance funds, too, are expected to be modest, given tensions in financial markets. According to the OeNB's securities holdings statistics, EUR 266 million of the total assets managed by severance funds were invested in Greece, Ireland, Italy, Portugal and Spain in the second quarter of 2011, with Greece accounting for a mere EUR 7.6 million.

The risks involved are primarily associated with persistent uncertainty in financial markets, the increased sovereign risk (given that government bonds account for some 34% of the total assets held by Austrian pension funds and for around 23% of the total assets held by severance funds), the risk of contagion spreading from banks and other financial corporations to the insurance industry as well as operational risk.

<sup>17</sup> 90% of the total assets invested by pension funds are managed indirectly via mutual funds. The OeNB's securities holdings statistics allows filtering at the single security level.

<sup>18</sup> See the article „Sanierung der Pensionskasse kostet 108 Millionen“ at [derStandard.at](http://derstandard.at/1319183607596/Wirtschaftskammer-Sanierung-der-Pensionskasse-kostet-108-Millionen) on November 23, 2011 (<http://derstandard.at/1319183607596/Wirtschaftskammer-Sanierung-der-Pensionskasse-kostet-108-Millionen> (retrieved on November 23, 2011)).

<sup>19</sup> Schmitz, S.W. 2005. Die Governance-Struktur der Pensionskassen in Österreich und ihre polit-ökonomischen Konsequenzen. In: *Wirtschaft und Gesellschaft* vol. 31(3). 407–443.

## Special Topics

# Detecting Financial Stability Vulnerabilities in Due Time: Can Simple Indicators Identify a Complex Issue?

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*This paper analyzes the resilience of credit institutions to instances of financial instability based on simple publicly available balance sheet and income statement figures. In the course of the recent financial crisis and the related credit turmoil, the loss absorption capacity of the global financial system has been stretched to its limit. Globally active financial institutions, many of them systemically relevant, needed government support to keep their capital ratios above regulatory and/or market required minima. Central banks had to step in to provide liquidity when large parts of the financial markets ceased to function. From an ex-post perspective, the crisis provided a real stress scenario which we use to explain bank performance by examining simple indicators such as capitalization, liquidity, funding structure and asset-side exposure. To cover systemically important European banks we choose a subset from the bank sample used by the European Banking Association for the EU-wide stress-testing exercise in 2011. We add three Austrian banks to arrive at a sample of 90 European banks in total (including altogether six Austrian banks). To measure bank performance, we use return on average assets, return on average equity, operating profits, required government support and equity prices. We show that these performance measures can be explained adequately by our simple indicators. We are able to identify the strong, respectively weak, banks that did not, respectively did, need government support in 2009. Regarding the other performance measures we give a forecast for 2011 about which banks are expected to perform well, ordinarily and poorly.*

*JEL classification: E44, E32, E37*

*Keywords: bank performance, financial crisis, stress testing, early warning*

## 1 Motivation

The recent global financial crisis turned public, political and academic attention to the development of early warning indicators for banks' resilience to instances of financial instability. This is a growing policy concern also in Europe, as highlighted by the EU-wide stress-testing exercise coordinated by the newly established European Banking Authority (EBA) in 2011. Academic interest typically focusses on early warning indicators in the aftermath of banking crises.

Any study on bank resilience must address a number of complex issues: How can bank performance and resil-

ience be measured in a meaningful way and what kind of variables do influence them? Which indicators deliver robust results that can be used as early warning signals? And how to deal with the creative tension between complex models that account for the limited availability of timely data and simpler models applying lower data standards?

### 1.1 Defining Bank Performance

In the literature, it is an established practice to use bank performance as a general indicator for bank resilience.<sup>2</sup> Measuring bank performance, however, is not a straightforward exercise as banks may differ substantially in their

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<sup>2</sup> See Demirgüç-Kunt et al. (2010), Ratnovski and Huang (2009) and Bologna (2010). As an alternative, Sun (2011) and Poghosyan and Cihak (2009) use expected default frequencies provided by Moody's KMV model to quantify bank resilience.

risk-taking profile. As long as markets work properly, bank performance needs to be risk-adjusted to serve as a meaningful indicator since risk and return are correlated. Otherwise, there is the danger that excessive risk-taking might go unnoticed in good times, since potential flaws in flat risk-weighted assets for certain sectors as well as toxic assets, misleading ratings, lenient provisioning policies and looser lending standards cannot be detected easily.

As Poghosyan and Cihak (2009) point out, up to the recent crisis Europe has seen only a small number of outright bank failures, which makes it very difficult from a statistical point of view to estimate and calibrate early warning models to be used in banking supervision. Although the deep current crisis has put many European banks on the brink of insolvency, government intervention has saved many institutions from failure. To solve the econometrical problem of having too few actual bank failures to draw from, Ratnovski and Huang (2009) suggest to measure bank performance by a dummy variable which indicates government support in response to extreme stress.

In our study we measure bank performance by different performance indicators such as equity price changes, government support and return on average assets.

## 1.2 Explaining Bank Performance

After defining bank performance, we must find variables that explain bank performance. With respect to the trade-off between model complexity and data availability, we follow Rat-

novski and Huang (2009) and Sun (2011) and test the hypothesis that simple publicly available balance sheet data serve as good explanatory variables to identify weak banks.<sup>3</sup>

Moreover, Poghosyan and Cihak (2001) report that well established complex indicators such as capital, asset quality, management quality as well as equity and liquidity grades are somewhat limited when it comes to predicting bank failures and therefore need to be complemented by other indicators.

To control for the robustness of our results, we test our set of indicators based on a sample of international banks without regard to institution-specific data. After all, any bank resilience analysis boils down to classifying a sample of banks into weak and sound institutions. Only a few papers have addressed the topic of resilience indicators based on the recent global financial crisis, i.a. Poghosyan and Cihak (2009) and Beltratti (2009). We hope the approach we suggest proves useful in enhancing supervisors' abilities to take a more forward-looking view on banks.

## 2 Data

To test our hypothesis, we analyze annual balance sheet and income statement data obtained from Bankscope and some additional market data obtained from Bloomberg. Our sample covers 90 banks from 21 European countries<sup>4</sup>. The sample largely mimics the EBA sample used for the EU-wide stress-testing exercise conducted in July 2011. The banks in the EBA sample account for over 65% of the EU banking system's total assets and for at least 50% of total consolidated assets

<sup>3</sup> Our dataset consists of annual balance and income statement data derived from the financial statements of banks made available through the Bankscope database of Bureau van Dijk.

<sup>4</sup> Austria, Belgium, Cyprus, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Hungary, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Sweden and Slovenia.



of the national banking sectors in each EU Member State at the end of 2010. In our subset of this sample, we had to exclude some smaller Spanish banks (cajas) as for these, some data relevant to our methodology are not available.<sup>5</sup>

In addition, to improve the robustness and check the plausibility of our results we apply our estimation methodology to an enlarged bank sample of 957 consolidated banks from various OECD countries, with each bank's total assets coming to over EUR 5 billion as of end-2010.

We selected our endogenous (performance) and exogenous (explanatory) variables based on related literature and with respect to the following criteria: comparability of results, data availability.

## 2.1 Variables to Measure Bank Performance

Following the standard literature on bank performance, we look at the return on average assets (ROAA = net income divided by average total assets) and the return on average equity (ROAE = net income divided by average total equity). The ROAA shows a bank's profitability before leverage, while the ROAE is an easily comparable profitability measure of shareholder value. In the literature, the ROAA is widely perceived to be valuable as a profitability and performance indicator since it is adjusted for the leverage effect. For this reason, focusing on the ROAE alone might sometimes render misleading results (Sun, 2011).

The second pair of performance measures are two variables derived from the income statement, namely

operating profits (after impairments), adjusted both for risk-weighted assets (RWA) and total assets, (operating profits divided by RWA; operating profits divided by total assets) to differentiate between risk weight-adjusted and non-risk weight-adjusted profitability ratios.<sup>6</sup>

Next, we include the relative year-on-year equity price change using year-end data.<sup>7</sup> According to Ratnovski and Huang (2009), the decline in equity prices serves as a credible performance measure since it includes credit losses, securities write-downs and dilution from new equity issuances including government capital injections.

The last performance measure we include is a dummy variable that captures government intervention during crisis periods. Here, we include banks that have received capital injections (excluding temporary central bank liquidity injections), loans or similar support vehicles or have been nationalized or merged during the crisis to avoid bankruptcy.

## 2.2 Variables Used to Explain Bank Performance

As explanatory variables we use a set of balance sheet and income statement variables. Three of our 13 explanatory variables mimic the ratios used by Ratnovski and Huang (2009). We include additional publically available variables to capture different areas of balance sheet fundamentals to improve the predictive power of the model.

To assess asset quality, we first proxy the flows in loan loss provisions (LLP) and use Bankscope stock data on impairment flows divided by total as-

<sup>5</sup> In 2009 and 2010, the Spanish banking sector was significantly restructured.

<sup>6</sup> Operating profits and net income are both risk adjusted with respect to impairments.

<sup>7</sup> In our performance variable selection we also compare year-end data with average December stock prices. Both measures provide very similar results.



sets as a proxy for nonperforming loans (NPLs). To measure the unexpected loss potential of banks' total portfolio we divide RWA by total assets. For capitalization we use a simple ratio of total balance sheet equity to total assets. To account for different bank business models (e.g. investment and universal banks), we assess the effects of banks' income structure on their resilience. Therefore, we include the ratio of net interest income to total assets and the ratio of non-interest operating income to total assets as explanatory variables. Concerning funding and liquidity, we look at the ratios of liquid assets<sup>8</sup> to total assets and customer deposits to total assets as used by Ratnovski and Huang (2009) in their analysis. We enhance these variables by the loan-to-customer deposit ratio (LDR) and long-term funding divided by total assets. To capture the portfolio structure of the observed banks, we use the ratios of relative trading book size to total assets and loan growth.

### 3 Empirical Analysis

In this section, we outline the econometric theory and estimation procedures behind our models to explain the different bank performance measures outlined in the data section. As stated in the introduction, we intend to answer the question of what kind of variables influence the status of the bank performance measure as a proxy for bank resilience. In line with a number of related papers on bank performance such as Sun (2011), we choose a panel model approach to link our perfor-

mance measures to balance sheet and income statement positions.<sup>9</sup>

We start from a model in which all coefficients are the same across individual banks and time, except the intercept term.

$$y_{i,t} = \alpha_i + x'_{i,t-1}\beta + u_{i,t} \quad (1)$$

It is assumed that  $u_{i,t} \sim N(0, \sigma_u^2)$  is independent of all  $x_{i,t}$ . Aside from these standard technical details, two further important remarks are necessary. First, we regress the current bank performance measure  $y_{i,t}$  on past balance sheet and income statement variables. This approach avoids endogeneity problems, helps identify problem banks based on their past balance and income statement structure and serves as a prerequisite for early warning indicators. Second, we fix  $\beta_i = \beta$  for all banks within our sample. This implies that the slope coefficients are supposed to be identical for all institutions and time periods. The most important advantage of panel models relates to the model intercept  $\alpha_i$ . As pointed out by Verbeek (2008), the availability of panel data will ease the problem of distinguishing between true and spurious state dependence, because individual histories are observed and can be included in the analysis. An individual specific intercept term allows controlling for unobserved variables such as management quality, bank business models and other bank-specific characteristics that are time invariant at least for the time span observed. For this paper we analyze in detail the influence of our explanatory

<sup>8</sup> The Bankscope position of liquid assets is harmonized for different jurisdictions and includes trading securities at fair value, cash, reverse repos and collateral and short-term claims on other banks.

<sup>9</sup> Referring to Verbeek (2008), panel models have two major advantages over models using only time series or cross sections, namely the efficiency of parameter estimation and the improved identification of parameters. We do not consider lags of higher order as we assume that the history of all past management decisions is reflected in the previous year's balance sheet and the resulting income statement structure.

variables on the return on average assets, on government support and equity prices.<sup>10</sup>

### 3.1 Return on Average Assets

First, we look at the ROAA as a performance measure.<sup>11</sup> In a series of tests, we come to the conclusion to reject the poolability hypothesis of our data sample. Following the standard literature on static panel econometrics, we are left with two options concerning: considering fixed effects or random effects. A Hausmann test implies that only the fixed-effect model provides consistent results.<sup>12</sup>

Table 1 in the annex reveals interesting empirical results. After controlling for several variables, three of the chosen variables show economic and statistical significance. The loan impairment charge ratio as a proxy for the LLP flow ratio lagged by one period has a significant negative influence on the current ROAA. The same holds true for net interest income ratio and the noninterest income ratio.

To test for the robustness of the insignificant RWA ratio, we estimated two further panel models with the same exogenous variables as listed in table 1, but using operating profits divided by total assets and operating profits divided by RWA as performance measures. The operating profits-di-

vided-by-total assets model gives a much better fit, indicating that RWA might not mirror economic risk in a meaningful way.<sup>13</sup> The fact that the influence of the leverage ratio (equity divided by total assets) on the ROAA is insignificant seems to be a surprising result at first glance. Since the balance sheet position “equity” does not distinguish between types of capital, “equity” does not include any information on capital quality (e.g. risk-bearing capacity). If the value for equity in the balance sheet equity is high, this does not necessarily signal that the respective institution is particularly crisis resilient, as pointed out by Sun (2011).

In contrast to Ratnovski and Huang (2009), neither the ratio of long-term funding to total assets, the ratio of depository funding to total assets nor the loan-to-deposit ratio have a significant influence on the ROAA in the subset of the EBA bank sample we use here. These surprising findings – no influence of long-term funding and depository funding on ROAA – could be explained by the fact that banks had access to ECB tenders during the crisis years, which means that banks with a riskier (short-term) funding structure, which relied mostly on the interbank market, were able to easily gain access to (unlimited) ECB tenders.<sup>14</sup> Finally, we could not provide empirical evi-

<sup>10</sup> The additional performance measures ROAE, operating income divided by total assets and operating income divided by RWA are used to check for the plausibility and robustness of the results obtained for the other three performance measures. On the one hand, ROAE is similar to ROAA except for the leverage effect and on the other hand, the operating income-related variables are used to analyze the importance of RWAs. The results of the additional performance measures are provided in tables 4, 5 and 6 in the annex.

<sup>11</sup> All estimations are carried out by the statistical software R and Stata.

<sup>12</sup> The same test procedure, ranging from poolability test to Hausmann test, is applied to all other performance measure estimations.

<sup>13</sup> Our result is in line with Sun (2011), who claims the RWA ratio is not always a useful indicator since there are difficulties in determining the unexpected loss potential of assets, accounting for deficiencies in mark-to-market accounting practices and locating assets and contingent claims (e.g. derivatives) in off-balance sheet vehicles where they can receive lower risk weights.

<sup>14</sup> In an additional panel model, we extended our bank sample to 957 OECD banks and find significant positive influence of the long-term funding and customer deposits-to-total asset ratio on the ROAA.

dence that the liquid asset ratio is a prominent factor in explaining the ROAA.<sup>15</sup>

### 3.2 Government Support

Table 2 in the annex shows our estimation outcome for the government support dummy in a linear panel probability model.<sup>16</sup> The positive coefficient for our loan loss provision ratio (LLPR) flow for the last period observed implies that the probability of government support increases. In contrast to the ROAA results, the total equity ratio is found to have a significant negative influence on government support, which implies that better capitalized banks were less likely to receive government support. The same holds true for the total noninterest operating income ratio and the liquid asset ratio. Surprisingly, the trading book ratio initially included into the estimation to control for banks' portfolio structure has a significantly negative sign, which *ceteris paribus* reduces the influence of the total noninterest operating income ratio on the probability of government support.

### 3.3 Equity Price Change

In contrast to the previous tables, table 3 in the annex shows hardly any signifi-

cant explanatory variables that predict the relative year-on-year equity price change.<sup>17</sup> Only the total equity ratio is found to have a significantly positive influence on the equity price change. Moreover, the overall explanatory power of the model is relatively low.<sup>18</sup> We think a couple of arguments might support our findings. First, the equity price change might not be the best market-based indicator for bank performance.<sup>19</sup> Second, we apply a different methodology than Ratnovski and Huang (2009) to classify banks according to their equity price performance. Third, equity prices are expected to be forward looking, which implies that balance sheet and income statement developments are priced in instantaneously to avoid arbitrage opportunities. Finally, the highly significant year dummies<sup>20</sup> point toward herding behavior, especially in periods of crisis and euphoria.

## 4 Early Warning Results

In this section we provide some evidence for the predictive power of our models to indicate whether they may serve as macroprudential early warning tools. First, we use the government support model to predict – for each

<sup>15</sup> Again, Ratnovski and Huang (2009) come up with a significant result. We think that their results are dominated by a special characteristic of the Canadian banking system, namely the liquidity guidelines stating that banks have to maintain a stock of highly liquid assets appropriate for their cash flow and funding profile.

<sup>16</sup> As we model government support as a binary variable, a correctly specified probability model would require a logit or probit transformation to ensure that the estimated probability of government support lies within the interval (0,1). However, especially in fixed-effect models, a couple of statistical problems with logit or probit transformations arise. E.g. for a fixed number of time periods and  $N \rightarrow \infty$ , the problem of incidental parameters makes an (unconditional) maximum likelihood estimation inconsistent because the number of unknown parameters grows with the sample size. As a consequence, we stick to the linear panel probability model and compare our results with probit-transformed random effect models to ensure robustness.

<sup>17</sup> Similar results are observed when using both year-end stock prices and average December prices.

<sup>18</sup> For the enlarged OECD bank sample we obtain slightly different results. Here, only the LLPR flow is significant at the 1% level with a somehow surprisingly positive coefficient. The overall fit is even worse than in the sample of European banks.

<sup>19</sup> See also Sun (2011), who uses the price-to-earnings ratio and the earnings and book values per share in his model.

<sup>20</sup> Year dummies refer to the level of each year's specific intercept, which means that by using these variables we account for developments that took place in the European market in the specific year.

bank – the probability of receiving government support (for the 90 European sample banks) in 2009 by applying lagged balance sheet and income statement variables from 2008. We rank the sample according to the probability distribution of the model output, where the first quartile is supposed to represent the most resilient banks and the last quartile the banks most likely to receive government support in the following year. The results of our model are in line with banks' actual performance during the crisis. In the first quartile, 16 of a total of 17 banks did not receive government support while in the fourth quartile, 14 of a total of 17 banks received government support in 2009.<sup>21</sup>

In the sample forecast of the ROAA, our model performed slightly less successfully, which can be attributed to the fact that, unlike government support, the ROAA is a continuous variable. Nevertheless, the model succeeds in identifying more than 60% of both the strongest and weakest banks. The out-of-sample ROAA forecast for end-2011 shows reasonable results. On the one hand, banks with a relatively low predicted ROAA broadly correspond with banks that showed negative results in their interim statements 2011. On the other hand, banks with low predicted returns are mostly located in countries that are perceived to experience adverse macroeconomic developments in 2011. This shows that the proposed models qualify as effective early warning tools.

## 5 Conclusions

In this paper we establish potential early warning tools for analyzing bank performance and contribute to the pre-

vious literature on bank performance by explaining different performance measures with the help of simple and publically available balance sheet and income-based variables and by comparing these measures.

Among the standard bank performance measures, our fixed explanatory variable set yields better results in explaining the ROAA than both the ROAE and equity price changes. The financial crisis provided a real adverse scenario that created an additional bank performance variable, namely the injection of government support capital.

Our explanatory variables capture different areas of balance sheet and income statement fundamentals. To a certain extent our method makes it possible to predict future banking performance using only a limited number of selected explanatory variables. The part of the model that is based on government support figures provides an accurate in-sample forecast for receiving government support in 2009.

Concerning the significance of the explanatory variables, we find differences among the performance measures. The probability of receiving government support and the ROAA are significantly influenced by the LLP flow ratio, by net interest income and the total noninterest income ratio. The balance sheet equity ratio and liquid asset ratio are found to only influence the probability of government support.

The funding-related variables (long-term funding and depository funding) appear not to be significant for government support and the ROAA in the sample of European banks. One explanation of this counter-intuitive result might be that mitigating actions by central banks, i.e. ample provision of

<sup>21</sup> According to the model, Austrian banks belong in the second and third quartiles with government support probabilities ranging between 27% and 54%.

liquidity, prevented the differences in bank performance between the banks in the sample to fully play out.

We also looked beyond mere structural ratios into banks' asset side. Interestingly, we found that in our bank sample the RWA ratio does not significantly influence any of the performance measures. This raises the question of whether RWA capture economic risk appropriately.

When explaining equity price changes, only a few exogenous variables apart from the year dummies seem to be significant. The year dummies are found to be highly significant for European banks and for the enlarged OECD control sample. This leads us to the conclusion that equity prices are dominated mostly by the overall market environment and do not reflect idiosyncratic bank characteristics very accurately.

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## Annex

Table 1

### Return on Average Assets

	Estimate	Standard error	t-value	p-value
<i>Sample of European banks (90 banks)</i>				
Lag(LoanImpairmentCharge/TotalAssets,1)	-118.5035	15.4221	-7.68	0.0000***
Lag(ProxyNPLStock/TotalAssets,1)	8.5323	5.6812	1.50	0.1351
Lag(TotalEquity/TotalAssets,1)	1.5883	6.1111	0.26	0.7953
Lag(RWAs/TotalAssets,1)	-1.0430	0.7350	-1.42	0.1578
Lag(NetInterestIncome/TotalAssets,1)	71.0205	17.4660	4.07	0.0001***
Lag(TotalNonInterestOpIncome/TotalAssets,1)	29.0752	13.4458	2.16	0.0321 *
Lag(LiquidAssets/TotalAssets,1)	1.1193	1.0301	1.09	0.2788
Lag(TotalCustomerDeposits/TotalAssets,1)	-0.6100	1.3829	-0.44	0.6598
Lag(Longtermfunding/TotalAssets,1)	1.5505	0.9892	1.57	0.1190
Lag(Loan.CustomerDeposit,1)	0.1315	0.0751	1.75	0.0819 •
Lag(ProxyTradingBook/TotalAssets,1)	1.0851	1.0147	1.07	0.2865
Lag(GrossLoanGrowth,1)	0.0855	0.2094	0.41	0.6837
Year dummy for 2007	-0.7547	1.0464	-0.72	0.4720
Year dummy for 2008	-1.2317	0.0901	-5.29	0.0000***
Year dummy for 2009	-1.7087	0.1308	-2.60	0.0100 *
Year dummy for 2010	-2.1857	0.1557	-0.33	0.7440
Root-squared: within, between and overall	0.5266	0.1366	0.3469	
Number of groups and observations	70	247		
From 2007 to 2010	4			

Source: Authors' calculations.

Note: Significance codes: 0.001 = \*\*\*, 0.01 = \*\*, 0.05 = \*, 0.1 = •.

Table 2

### Government Support

	Estimate	Standard error	t-value	p-value
<i>Sample of European banks (90 banks)</i>				
Lag(LoanImpairmentCharge/TotalAssets,1)	24.8513	7.6571	3.25	0.0014 **
Lag(ProxyNPLStock/TotalAssets,1)	3.6956	2.8886	1.28	0.2025
Lag(TotalEquity/TotalAssets,1)	-8.2203	3.1832	-2.58	0.0107 *
Lag(RWAs/TotalAssets,1)	-0.0245	0.3932	-0.06	0.9504
Lag(NetInterestIncome/TotalAssets,1)	-8.0598	9.6317	-0.84	0.4039
Lag(TotalNonInterestOpIncome/TotalAssets,1)	-18.2033	6.9452	-2.62	0.0096 **
Lag(LiquidAssets/TotalAssets,1)	-1.5832	0.5126	-3.09	0.0024 **
Lag(TotalCustomerDeposits/TotalAssets,1)	0.3265	0.7796	0.42	0.6759
Lag(Longtermfunding/TotalAssets,1)	-1.0287	0.5444	-1.89	0.0605 •
Lag(Loan.CustomerDeposit,1)	0.0333	0.0422	0.79	0.4316
Lag(ProxyTradingBook/TotalAssets,1)	-1.7152	0.5637	-3.04	0.0027 **
Lag(GrossLoanGrowth,1)	-0.2374	0.1134	-2.09	0.0379 *
Year dummy for 2007	-	-	-	-
Year dummy for 2008	-	-	-	-
Year dummy for 2009	-	-	-	-
Year dummy for 2010	-	-	-	-
Root-squared: within, between and overall	0.4794	0.2031	0.2492	
Number of groups and observations	71	252		
From 2007 to 2010	4			

Source: Authors' calculations.

Note: Significance codes: 0.001 = \*\*\*, 0.01 = \*\*, 0.05 = \*, 0.1 = •.

Table 3

### Equity Price Change

	Estimate	Standard error	t-value	p-value
<i>Sample of European banks (90 banks)</i>				
Lag(LoanImpairmentCharge/TotalAssets,1)	-4.8091	10.4480	-0.46	0.6463
Lag(ProxyNPLStock/TotalAssets,1)	0.5525	4.3886	0.13	0.9001
Lag(TotalEquity/TotalAssets,1)	10.2260	4.5980	2.22	0.0283 *
Lag(RWAs/TotalAssets,1)	-0.0514	0.5635	-0.09	0.9275
Lag(NetInterestIncome/TotalAssets,1)	-3.3542	12.1735	-0.28	0.7834
Lag(TotalNonInterestOpIncome/TotalAssets,1)	14.3501	12.5364	1.14	0.2549
Lag(LiquidAssets/TotalAssets,1)	0.4465	0.7776	0.57	0.5670
Lag(TotalCustomerDeposits/TotalAssets,1)	-1.2442	1.0460	-1.19	0.2369
Lag(Longtermfunding/TotalAssets,1)	-0.1519	0.7169	-0.21	0.8326
Lag(Loan.CustomerDeposit,1)	0.0197	0.0494	0.40	0.6909
Lag(ProxyTradingBook/TotalAssets,1)	0.2808	0.7298	0.38	0.7012
Lag(GrossLoanGrowth,1)	0.2019	0.1435	1.41	0.1623
Year dummy for 2007	-0.4089	0.7486	-0.55	0.5860
Year dummy for 2008	-0.9372	0.0689	-7.67	0.0000***
Year dummy for 2009	0.2305	0.0983	6.51	0.0000***
Year dummy for 2010	-0.3685	0.1153	0.35	0.7270
Root-squared: within, between and overall	0.7228	0.0698	0.5422	
Number of groups and observations	46	167		
From 2007 to 2010	4			

Source: Authors' calculations.

Note: Significance codes: 0.001 = \*\*\*, 0.01 = \*\*, 0.05 = \*, 0.1 = •.

Table 4

### Return on Average Equity

	Estimate	Standard error	t-value	p-value
<i>Sample of European banks (90 banks)</i>				
Lag(LoanImpairmentCharge/TotalAssets,1)	-2,362.5527	609.2942	-3.88	0.0002***
Lag(ProxyNPLStock/TotalAssets,1)	428.7573	224.4500	1.91	0.0579 •
Lag(TotalEquity/TotalAssets,1)	579417	241.4367	0.24	0.8106
Lag(RWAs/TotalAssets,1)	13.5442	29.0388	0.47	0.6415
Lag(NetInterestIncome/TotalAssets,1)	1,322.0367	690.0451	1.92	0.0571 •
Lag(TotalNonInterestOpIncome/TotalAssets,1)	679.3825	531.2135	1.28	0.2028
Lag(LiquidAssets/TotalAssets,1)	19.4388	40.6963	0.48	0.6335
Lag(TotalCustomerDeposits/TotalAssets,1)	-48.1181	54.6359	-0.88	0.3798
Lag(Longtermfunding/TotalAssets,1)	30.5188	39.0819	0.78	0.4360
Lag(Loan.CustomerDeposit,1)	3.7719	2.9667	1.27	0.2054
Lag(ProxyTradingBook/TotalAssets,1)	-20.4427	40.0873	-0.51	0.6108
Lag(GrossLoanGrowth,1)	-29.4994	8.2746	-3.57	0.0005***
Year dummy for 2007	-10.9185	41.3429	-0.26	0.7920
Year dummy for 2008	-25.2006	3.5604	-4.01	0.0000***
Year dummy for 2009	-22.5234	5.1692	-2.25	0.0260 *
Year dummy for 2010	-19.5475	6.1504	-1.40	0.1630
Root-squared: within, between and overall	0.312	0.0014	0.0698	
Number of groups and observations	70	247		
From 2007 to 2010	4			

Source: Authors' calculations.

Note: Significance codes: 0.001 = \*\*\*, 0.01 = \*\*, 0.05 = \*, 0.1 = •.



Table 5

### Ratio of Operating Profit to Total Assets

	Estimate	Standard error	t-value	p-value
<i>Sample of European banks (90 banks)</i>				
Lag(LoanImpairmentCharge/TotalAssets,1)	-0.8651	0.1422	-6.08	0.0000***
Lag(ProxyNPLStock/TotalAssets,1)	0.0001	0.0533	0.00	0.9978
Lag(TotalEquity/TotalAssets,1)	0.0933	0.0568	1.64	0.1023
Lag(RWAs/TotalAssets,1)	—	—	—	—
Lag(NetInterestIncome/TotalAssets,1)	0.5777	0.1705	3.39	0.0009***
Lag(TotalNonInterestOpIncome/TotalAssets,1)	-0.0061	0.1207	-0.05	0.9596
Lag(LiquidAssets/TotalAssets,1)	0.0083	0.0092	0.90	0.3676
Lag(TotalCustomerDeposits/TotalAssets,1)	0.0120	0.0129	0.93	0.3526
Lag(Longtermfunding/TotalAssets,1)	0.0132	0.0097	1.37	0.1720
Lag(Loan.CustomerDeposit,1)	0.0014	0.0007	1.97	0.0509 •
Lag(ProxyTradingBook/TotalAssets,1)	0.0146	0.0090	1.62	0.1077
Lag(GrossLoanGrowth,1)	0.0038	0.0019	2.02	0.0452 *
Year dummy for 2007	-0.0190	0.0085	-2.22	0.0280 *
Year dummy for 2008	-0.0246	0.0009	-6.49	0.0000***
Year dummy for 2009	-0.0232	0.0012	-3.46	0.0010 **
Year dummy for 2010	-0.0194	0.0014	-0.29	0.7720
Root-squared: within, between and overall	0.4742	0.4829	0.4999	
Number of groups and observations	70	249		
From 2007 to 2010	4			

Source: Authors' calculations.

Note: Significance codes: 0.001 = \*\*\*, 0.01 = \*\*, 0.05 = \*, 0.1 = •.

Table 6

### Ratio of Operating Profit to Risk-Weighted Assets

	Estimate	Standard error	t-value	p-value
<i>Sample of European banks (90 banks)</i>				
Lag(LoanImpairmentCharge/TotalAssets,1)	15.5571	10.1909	1.53	0.1288
Lag(ProxyNPLStock/TotalAssets,1)	-4.3718	3.7577	-1.16	0.2463
Lag(TotalEquity/TotalAssets,1)	3.6111	3.8726	0.93	0.3525
Lag(RWAs/TotalAssets,1)	—	—	—	—
Lag(NetInterestIncome/TotalAssets,1)	9.4413	11.5288	0.82	0.4140
Lag(TotalNonInterestOpIncome/TotalAssets,1)	-14.5574	8.7791	-1.66	0.0992 •
Lag(LiquidAssets/TotalAssets,1)	0.3312	0.6485	0.51	0.6102
Lag(TotalCustomerDeposits/TotalAssets,1)	2.8747	0.9086	3.16	0.0019 **
Lag(Longtermfunding/TotalAssets,1)	0.4440	0.6697	0.66	0.5082
Lag(Loan.CustomerDeposit,1)	0.0747	0.0491	1.52	0.1301
Lag(ProxyTradingBook/TotalAssets,1)	0.6973	0.6938	1.01	0.3164
Lag(GrossLoanGrowth,1)	0.1228	0.1312	0.94	0.3505
Year dummy for 2007	-1.7446	0.5996	-2.91	0.0040***
Year dummy for 2008	-1.7297	0.0599	0.25	0.8040
Year dummy for 2009	-1.8392	0.0838	-1.13	0.2610
Year dummy for 2010	-1.8511	0.0994	-1.07	0.2850
Root-squared: within, between and overall	0.1193	0.1131	0.0596	
Number of groups and observations	70	249		
From 2007 to 2010	4			

Source: Authors' calculations.

Note: Significance codes: 0.001 = \*\*\*, 0.01 = \*\*, 0.05 = \*, 0.1 = •.

Table 7

### Return on Average Assets

	Estimate	Standard error	t-value	p-value
<i>Sample of OECD banks (957 banks)</i>				
Lag(LoanImpairmentCharge/TotalAssets,1)	-83.1925	5.3625	-15.51	0.0000***
Lag(ProxyNPLStock/TotalAssets,1)	12.9437	2.6189	4.94	0.0000***
Lag(TotalEquity/TotalAssets,1)	-5.7711	2.6482	-2.18	0.0296 *
Lag(RWAs/TotalAssets,1)	-0.7030	0.4937	-1.42	0.1548
Lag(NetInterestIncome/TotalAssets,1)	35.6976	10.8601	3.29	0.0011 **
Lag(TotalNonInterestOpIncome/TotalAssets,1)	5.3246	5.8989	0.90	0.3670
Lag(LiquidAssets/TotalAssets,1)	1.3127	0.6502	2.02	0.0438 *
Lag(TotalCustomerDeposits/TotalAssets,1)	2.6332	0.7192	3.66	0.0003***
Lag(Longtermfunding/TotalAssets,1)	2.5088	0.7652	3.28	0.0011 **
Lag(Loan.CustomerDeposit,1)	0.0000	0.0001	0.01	0.9906
Lag(GrossLoanGrowth,1)	0.0198	0.0964	0.21	0.8374
Year dummy for 2007	-0.9392	0.4998	-1.88	0.0610 •
Year dummy for 2008	-1.3841	0.0796	-5.59	0.0000***
Year dummy for 2009	-1.3984	0.0902	-5.09	0.0000***
Year dummy for 2010	-1.1468	0.0964	-2.15	0.0320 *
Root-squared: within, between and overall	0.3314	0.0476	0.159	
Number of groups and observations	444	1,267		
From 2007 to 2010	4			

Source: Authors' calculations.

Note: Significance codes: 0.001 = \*\*\*, 0.01 = \*\*, 0.05 = \*, 0.1 = •.

Table 8

### Return on Average Equity

	Estimate	Standard error	t-value	p-value
<i>Sample of OECD banks (957 banks)</i>				
Lag(LoanImpairmentCharge/TotalAssets,1)	-1,754.7538	123.4648	-14.21	0.0000***
Lag(ProxyNPLStock/TotalAssets,1)	395.0031	60.2978	6.55	0.0000***
Lag(TotalEquity/TotalAssets,1)	-168.0256	60.9728	-2.76	0.0060 **
Lag(RWAs/TotalAssets,1)	-4.6233	11.3664	-0.41	0.6843
Lag(NetInterestIncome/TotalAssets,1)	795.5429	250.0419	3.18	0.0015 **
Lag(TotalNonInterestOpIncome/TotalAssets,1)	93.5276	135.8151	0.69	0.4912
Lag(LiquidAssets/TotalAssets,1)	28.2402	14.9701	1.89	0.0596 •
Lag(TotalCustomerDeposits/TotalAssets,1)	51.2948	16.5584	3.10	0.0020 **
Lag(Longtermfunding/TotalAssets,1)	72.0967	17.6182	4.09	0.0000***
Lag(Loan.CustomerDeposit,1)	-0.0003	0.0023	-0.15	0.8845
Lag(GrossLoanGrowth,1)	-0.5005	2.2192	-0.23	0.8216
Year dummy for 2007	-16.2603	7.6940	-2.11	0.0350 *
Year dummy for 2008	-25.4831	1.8081	-5.10	0.0000***
Year dummy for 2009	-23.6577	1.9121	-3.87	0.0000***
Year dummy for 2010	-18.5681	2.0673	-1.12	0.2640
Root-squared: within, between and overall	0.2665	0.0813	0.177	
Number of groups and observations	444	1,276		
From 2007 to 2010	4			

Source: Authors' calculations.

Note: Significance codes: 0.001 = \*\*\*, 0.01 = \*\*, 0.05 = \*, 0.1 = •.

Table 9

## Equity Price

	Estimate	Standard error	t-value	p-value
<i>Sample of OECD banks (957 banks)</i>				
Lag(LoanImpairmentCharge/TotalAssets,1)	21.1577	5.9573	3.55	0.0004***
Lag(ProxyNPLStock/TotalAssets,1)	-2.3263	2.2681	-1.03	0.3058
Lag(TotalEquity/TotalAssets,1)	3.5615	2.3079	1.54	0.1237
Lag(RWAs/TotalAssets,1)	0.0800	0.3810	0.21	0.8339
Lag(NetInterestIncome/TotalAssets,1)	-8.7091	7.5249	-1.16	0.2479
Lag(TotalNonInterestOpIncome/TotalAssets,1)	4.9954	4.0292	1.24	0.2159
Lag(LiquidAssets/TotalAssets,1)	-0.8662	0.4894	-1.77	0.0776 •
Lag(TotalCustomerDeposits/TotalAssets,1)	0.6185	0.5839	1.06	0.2902
Lag(Longtermfunding/TotalAssets,1)	-0.8976	0.5704	-1.57	0.1165
Lag(Loan.CustomerDeposit,1)	0.0721	0.0362	1.99	0.0469*
Lag(GrossLoanGrowth,1)	-0.1916	0.0772	-2.48	0.0135
Year dummy for 2007	-0.3342	0.4292	-0.78	0.4370
Year dummy for 2008	-0.8146	0.0549	-8.75	0.0000***
Year dummy for 2009	-0.0518	0.0656	4.30	0.0000***
Year dummy for 2010	-0.4029	0.0782	-0.88	0.3810
Root-squared: within, between and overall	0.4843	0.1227	0.2555	
Number of groups and observations	209	568		
From 2007 to 2010	4			

Source: Authors' calculations.

Note: Significance codes: 0.001 = \*\*\*, 0.01 = \*\*, 0.05 = \*, 0.1 = •.

# What Drives Aggregate Credit Risk?

Stefan Kerbl,  
Michael Sigmund<sup>1</sup>

*A deep understanding of the drivers of credit risk is valuable for financial institutions as well as for regulators from multiple viewpoints. The systemic component of credit risk drives losses across portfolios and thus poses a threat to financial stability. Traditional approaches consider macroeconomic variables as drivers of aggregate credit risk (ACR). However, recent literature suggests the existence of a latent risk factor influencing ACR, which is regularly interpreted as the latent credit cycle. We explicitly model this latent factor by adding an unobserved component to our models, which already include macroeconomic variables. In this paper we make use of insolvency rates of Austrian corporate industry sectors to model realized probabilities of default. The contribution of this paper to the literature on ACR risk is threefold. First, in order to cope with the lack of theory behind ACR drivers, we implement state-of-the-art variable selection algorithms to draw from a rich set of macroeconomic variables. Second, we add an unobserved risk factor to a state space model, which we estimate via a Kalman filter in an expectation maximization algorithm. Third, we analyze whether the consideration of an unobserved component indeed improves the fit of the estimated models.*

*JEL classification: E44, E32, E37*

*Keywords: credit risk, unobserved component models, state space, Kalman filter, stress testing*

## 1 Introduction and Motivation

The enormous rise in the number of publications on credit risk over the last decades bears testimony to an increasing interest in this topic. From a systemic perspective, the level of aggregate credit risk (ACR) is of major interest as – in contrast to idiosyncratic (borrower-specific) credit risk – it cannot be diversified away and is therefore a potential source of financial instability. Although the nature of ACR suggests that it is primarily of concern to regulators, central banks and supervisory authorities, more and more commercial banks and other financial institutions seek a deeper understanding of ACR as this is essential to managing risk, maintaining a sound capital planning process and applying meaningful stress testing programs as well as a consistent approach to designing an adequate rating model philosophy<sup>2</sup>. The value of structured products, or of any portfolio with non-zero credit risk, is largely determined by their inherent systemic component – an important

point that should be clear after the 2008/2009 financial crisis.

In addition, the growing relevance of forecasting ACR is evident from the numerous stress tests carried out by central banks around the world, as ACR forecasts constitute a precondition for stress-testing. To be able to perform efficient system-wide stress testing, central banks or any other supervisory authorities need a structured approach to forecasting ACR.

Hence, a profound understanding of ACR drivers is of high relevance for banks and supervisors alike. Numerous papers have addressed this topic in recent years; inter alia Nickell et al. (2000), Koopman and Lucas (2005) and Couderc and Renault (2005). However, any approach to finding significant drivers of ACR faces two major challenges:

- Given the lack of a clear-cut theoretical framework explaining the causes and driving factors of ACR in a financial system, a long list of macroeconomic variables is a priori available for explaining ACR. Select-

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<sup>2</sup> See the distinction between point-in-time and through-the-cycle models, e.g. in Heitfield (2005).

ing among them becomes even more challenging when taking the possible dynamic lag structure of these macroeconomic variables into account.

- At the same time, there is mounting evidence of latent factors driving (aggregate) credit risk, as emphasized recently by Lown and Morgan (2004), Jimenez and Mencia (2009), Koopman et al. (2009) and Bruche and Gonzalez-Aguado (2010). With no directly measurable metric at hand, the question is how to incorporate this evidence into an econometric model.

In this paper we present an approach that deals with both of the above issues in a state-of-the-art fashion. In order to manage the high number of possible explanatory variables for ACR, we make use of advanced variable selection techniques (Hastie et al., 2009). We cope with the second issue by following the approach of Jimenez and Mencia (2009) and Koopman et al. (2009), treating the credit cycle as a latent factor.

Since Kalman (1960) described a recursive solution to the discrete data linear filtering problem (Kalman filter), the idea of incorporating an unobserved state variable into a state space model has led to an extensive amount of literature in various fields of science. In economics, state space models are used as a very flexible tool in time series analysis.<sup>3</sup> Harvey and Koopman (2009) give a short introduction into the various applications of state space models in economics and finance. The

most prominent applications are macroeconomic models used to identify the natural rate of unemployment, permanent consumption, the output gap or the expected rate of inflation, and time series models such as trend-cycle decomposition and seasonal component models (Burmeister et al., 1986).

Only recently, state space models have drawn attention in credit risk-related research. The respective papers aim at exploring the so-called “hidden,” “unobserved” or “latent” credit risk factors.<sup>4</sup> In general, these different terms all point to models that try to incorporate unobserved factors (defined as state variables) in credit risk analysis. The evolution of these (unobserved) states is usually driven by transition probabilities.

Crowder et al. (2005), Bruche and Gonzalez-Aguado (2010), Koopman et al. (2008) and Banachewicz et al. (2008) assume that the state variable (latent risk factor) is discrete and the number of states is at least two (a “good” and a “bad” state). The resulting models are commonly referred to as hidden Markov models.<sup>5</sup> By contrast, Koopman and Lucas (2005), Jimenez and Mencia (2009) and McNeil and Wendin (2007) choose a more general approach in terms of state space by modeling it as a continuous state variable.<sup>6</sup> This setup-up leads to the classical state space model described by Kalman (1960).

Nevertheless, there is no common theoretical view on the source and/or definition of latent factors. They could be related to (a mixture of) general

<sup>3</sup> For example, to estimate their parameters, autoregressive moving average models, dynamic stochastic general equilibrium models and time-varying coefficient models can be put into a state space form.

<sup>4</sup> In this paper, we use the expression latent risk factor to refer to the general idea of including additional unobserved predictors in various models. In our models, latent risk factors are added as unobserved components.

<sup>5</sup> See Rabiner (1989) for details on recursions and filter techniques used to extract the not directly observed sequence of hidden states from the system being modeled in which only the state-dependent output variables are observed.

<sup>6</sup> A continuous state variable leads to more restrictions on other model assumptions, in particular on the transition equation. See Minka (1999) for more details.

credit market conditions such as the leverage and/or solvency ratios of creditors, collateral and other asset values or it could, via the lending channel, supply adjunct criteria such as banks' capital buffers and lending criteria, etc. In any case, the latent factor should be a variable that is unobserved (at least in our dataset), but still has a significant and persistent impact on credit risk.

In view of the recent financial crisis, one promising idea would be to relate the credit cycle to the leverage cycle, as explicitly defined by Geanakoplos (2010) and Fostel and Geanakoplos (2008). In their papers, they argue that a small initial drop in the value of assets and collateral causes a big drop in the wealth of leveraged “optimists,” which is then amplified by forced sales and uncertainty.

A second credit cycle theory assumes the following relation between credit standards, banking competition and the phase of the business cycle. In a nutshell, empirical studies report that (too) lenient credit standards during an economic upturn result in the build-up of high credit risk, which materializes in the ensuing economic downturn.<sup>7</sup> As analyzed by Ruckes (2004), such behavior can be supported by banks' profit-maximizing strategies in a simple game theoretic setting. In line with his model, credit standards vary anti-cyclically and therefore might enhance the influence of the macroeconomy on ACR.

Third, the credit cycle could be explained by the theory of cyclical default correlation (Giesecke, 2004), which can be understood as a partly systemic risk factor founded in the existence of

direct ties (e.g. financial, legal or client-supplier links) between firms.<sup>8</sup>

Our paper tests whether there is evidence for a latent effect on ACR. It builds on previous work by Boss (2002) and Boss et al. (2009) describing the current OeNB macro-to-probability of default models. We extend these OeNB models in two ways. First, we add a new dimension to the discussion about the link between the macroeconomy and credit risk measures by enlarging the set of possible macroeconomic predictors.<sup>9</sup> We apply advanced variable selection algorithms to find the best macroeconomic predictors for a given model size. Second, we integrate an unobserved factor into the models via a state space formulation, thus enriching them by explicitly modeling the hypothesized credit cycle.

In a next step, we interpret the sector-specific results. Finally, we evaluate the results by comparing the state space model output with the output obtained from the traditional models that are based on macroeconomic factors only.

## 2 Model Specifications

In this section we outline the econometric theory and estimation procedures behind the models used to explain ACR. In terms of data, we use – in line with previous work by Boss (2002) and Boss et al. (2009) – quarterly default frequency rates from 1985 to the first quarter of 2011 as provided by *Kreditschutzverband von 1870* to approximate sectoral corporate probabilities of default in Austria. These default frequency rates are calculated by dividing the number of quarterly defaults by

<sup>7</sup> See e.g. Lang and Nakamwa (1995) and Bonfim (2009).

<sup>8</sup> Such direct ties could lead to contagion effects that describe the default dependence between interconnected corporates. See e.g. Eisenberg and Noe (2001).

<sup>9</sup> In a classical multivariate framework, this boils down to re-examining the trade-off between the bias and variance of estimated results.

Table 1

the total number of firms. The corporate sectors in question are construction, production, trade, transport, tourism and services.<sup>10</sup> The macroeconomic variables used to construct our design matrix are taken from the OeNB's macroeconomic database. The set of explanatory variables  $\{x_j\}_{j=1}^k$  might contain lagged dependent variables, which multiplies the pool of candidate predictors. Specifically, we extend the original dataset by one to six lags of each time series.

As a starting point for modeling ACR, we look at the linear observable macroeconomic factor model:

$$y_{i,t} = \beta_{0,i} + \sum_{j=1}^k x_{j,t} \beta_{j,i} + \epsilon_{i,t}, \quad (1)$$

where  $y_i$  is the logit-transformed sectoral default frequency rates<sup>11</sup> ( $i \in \{0, 1, 2, \dots, 7\}$ ),  $k$  is the number of macroeconomic predictors and  $t \in \{1, 2, \dots, T\}$  constitutes the time index.  $x_j$  is the  $j^{\text{th}}$  transformed macroeconomic predictor.<sup>12</sup>

### How to Select Explanatory Variables?

In this section, we address the first issue raised in the introduction: As, in our opinion, general equilibrium literature on credit markets does not provide the sufficient theoretical background for deriving explanatory variables, the list of candidate predictors is extensive and, as a consequence, candidate predictors might even outnumber observa-

### Possible Explanatory Macroeconomic Variables<sup>1</sup>

Abbreviation	Meaning	Transformation
ATX	Austrian Traded Index	YoY-Log-Difference
CPNReal	Real private credit, amount outstanding	YoY-Log-Difference
DDR	Real domestic demand	YoY-Log-Difference
GONReal	Real gross operating surplus	YoY-Log-Difference
HIC	Harmonised Index of Consumer Prices	YoY-Rel-Difference
IER	Real equipment investment	YoY-Log-Difference
IOR	Real other investment	YoY-Log-Difference
LTIRReal	Real long-term interest rate	No
MTR	Real imports	YoY-Log-Difference
PCR	Real private consumption	YoY-Log-Difference
POIL	Oil price in domestic currency	YoY-Log-Difference
PRO	Average labor productivity	YoY-Log-Difference
PSNReal	Real private sector savings	YoY-Log-Difference
PYR	Real private sector disposable income	YoY-Log-Difference
STIRReal	Real short-term interest rate	No
URX	Unemployment rate	YoY-Rel-Difference
WURYD	Real compensation per employee	YoY-Log-Difference
XTR	Real exports	YoY-Log-Difference
YER	Real GDP	YoY-Log-Difference

Source: The OeNB's macroeconomic database, Bloomberg.

<sup>1</sup> For each variable, up to six quarterly lags are considered.

tions. In previous work on the topic, regressors have been selected by mere qualitative reasoning (see e.g. Jimenez and Mencia, 2009 and Koopman et al., 2008). Boss et al. (2009) group the variables into thematic sets and allow only one variable from each set to be selected. In order to deal with the high variance-versus-low bias trade-off in a nonheuristic way, we depart from these qualitative approaches and consider a data-driven subset selection mechanism.

One of the available subset selection algorithms is the so-called *Best Subset Selection*<sup>13</sup>, which selects for each  $k \in \{0, 1, 2, \dots, p\}$  the subset of size  $k$  that gives the smallest residual sum of

<sup>10</sup> Corporate sectors are classified according to NACE Rev. 2, the classification of economic activities applied throughout the European Union (European Commission, 2008). See Zeller et al. (2008) for more details.

<sup>11</sup> The logit transformation ensures that the default frequency rates used remain within the interval (0;1). A probit transformation would serve the same purpose. Other popular approaches to modeling dependent ratios without transforming them include the fractional logistic regression by Papke and Wooldridge (1996) and beta regression models (Ferrari and Cribari-Neto, 2004). A discussion of the advantages and disadvantages of the different approaches to modeling dependent ratios would be beyond the scope of this paper.

<sup>12</sup> See table 1 for details.

<sup>13</sup> See Hastie et al. (2009) for details.



squares. The variance-versus-bias trade-off is directly linked to the choice of  $k$  and is therefore a discrete mechanism. With respect to model interpretation, Best Subset Selection offers the choice of  $k$  input variables from the set of  $p$  variables. However, a severe drawback is the computational cost of this method. The fact that the number of possible models increases exponentially with  $p$  puts a relatively low bound on feasible values of  $p$  ( $p < 50$ ) even with a fast algorithm such as the leaps and bounds procedure at hand.<sup>14</sup> Consequently, the application of Best Subset Selection would require a preselection of the variables considered above, especially when one wants to account for a dynamic lag structure.

Alternatives to this approach are *Forward and Backward Stepwise Selection*<sup>15</sup>. Forward Stepwise Selection starts with an intercept and sequentially adds the regressors which contribute most to an improvement of the fit (as measured e.g. by the *Bayesian information criterion* – BIC) until  $k$  variables are selected (Hastie et al., 2009). Backward Stepwise Selection starts with the full model and sequentially drops the least important variables in terms of model fit until  $k$  variables are reached. While not as computationally demanding as Best Subset Selection, these algorithms might not select the “optimal” set from the perspective of the minimal residual sum of squares. A comparison between Best Subset Selection and Forward Stepwise Selection applied to different subsamples of our dataset shows that the two mechanisms produce rela-

tively similar results. As Backward Stepwise Selection requires the number of candidate predictors to be smaller than the number of observations,  $p < T$ , a preselection of variables – as in the case of Best Subset Selection – would still be necessary to make the selection procedure applicable.

As a third alternative selection procedure, *shrinkage methods*<sup>16</sup> appear to be promising. In contrast to subset selection, shrinkage methods do not retain or discard a variable but “shrink” the regression coefficients by imposing a penalty on their size. For example, the *elastic net* procedure proposed by Zou and Hastie (2005) is a shrinkage method which uses a convex combination of the L1 (lasso) and the L2 (ridge regression) norm as the penalty restriction in the standard minimization of the sum of residual squares (with respect to the vector  $\beta$ ) to estimate equation (1). While promising at first sight, the combination of shrinkage methods with the estimation of latent factors (see below) requires a largely revised estimation procedure and is beyond the scope of this paper.

By way of summary, we find that Best Subset Selection and Backward Stepwise Selection both require a preselection of variables, while shrinkage methods do not, in general, allow for including latent factors within the state space framework.<sup>17</sup> Therefore, we will use Forward Stepwise Selection, which does not require any form of variable preselection and shows a promising performance in simulation exercises (Hastie et al. 2009).

<sup>14</sup> See Furnival and Wilson (1974) for details.

<sup>15</sup> See Hastie et al. (2009) for details.

<sup>16</sup> See Hastie et al. (2009) for details.

<sup>17</sup> The question of how to combine the elastic net algorithm with an unobserved component in a Bayesian framework is currently being examined in an ongoing research project.

### How to Incorporate the Latent Credit Cycle?

In a next step we extend our macroeconomic factor model by “latent risk factors.” Motivated by the discussion presented in section 1, we add an unobserved risk factor to the framework of equation (1) and will refer to this new equation as the measurement equation (2). We explicitly model the latent credit cycle as an autoregressive state process that evolves through time and refer to this specification as the state equation (3).

$$y_{i,t} = X_{i,t} \Gamma_i + z_{i,t} \lambda_i + v_{i,t} \quad (2)$$

$$v_{i,t} \sim \mathcal{N}(0, r_i)$$

$$z_{i,t} = z_{i,t-1} \phi_i + w_{i,t} \quad (3)$$

$$w_{i,t} \sim \mathcal{N}(0, q_i)$$

In addition to the previous notation,  $\lambda_i, \Gamma_i, \Phi_i, q_i$  and  $r_i$  are parameters to be estimated,  $z_{i,t}$  is the unobserved factor, and  $v_{i,t}$  and  $w_{i,t}$  are error terms. Capital letters denote matrices (or vectors) and small letters scalars. Moreover, we assume that  $Cov(v_{i,t}, w_{i,t}) = 0$  and that there are no cross-correlations in the state and measurement equation between the sectors  $i$ ,  $Cov(w_{j,t}, w_{i,t}) = 0$  and  $Cov(v_{i,t}, v_{i,t}) = 0$  for any  $i \neq j$ .

We estimate the equation systems (2) and (3) via an expectation maximization algorithm (EM algorithm)<sup>18</sup>. Based on an initial set of parameters ( $\lambda_i, \Gamma_i, \phi_i, q_i$  and  $r_i$ ), the unobserved component is extracted via the Kalman filter in the expectation step. Given the unobserved component  $z_i$ , the likelihood of equation (2) is maximized with

respect to the parameter set. These steps are repeated until convergence.<sup>19</sup>

However, the state space representation of a given dynamic system might not be uniquely defined by a given parameter set  $\lambda_i, \Gamma_i, \phi_i, q_i, r_i$  without restricting some of these parameters. This can be seen from the fact that the likelihood function of the equation system would remain unchanged as multiplying equation (3) with any non-zero factor or nonsingular matrix would measure the unobserved factor on a different scale.<sup>20</sup>

Consequently, we fix the metric of the unobserved variable by restricting  $q_i = 1$  without loss of generality.

### 3 Results

In this section we present evidence of the relevance of the latent factor in our dataset as well as an analysis of the most frequently selected variables. For this purpose we estimate models for each of the corporate sectors under review with a varying number of explanatory variables. The explanatory variables are chosen by applying the Forward Stepwise Selection method described in section 2. For each number of explanatory variables ranging from 1 to 15, we estimate the top five models according to their explained sum of squares, which results in 75 models per sector.<sup>21</sup> Additionally, to gain insight into the importance of latent factors for explaining ACR, we estimate these models with and without an unobserved component. To compare the respective results, we follow Koopman

<sup>18</sup> See McLachlan and Thriyambakam (1996) for details.

<sup>19</sup> See Shumway and Stoffer (2006) and Holmes (2010) for details.

<sup>20</sup> For more details, see Hamilton (1994) and Carro et al. (2010).

<sup>21</sup> Thus, models of different sizes do not compete with each other, and applying any selection criteria such as the Akaike information criterion (AIC) or the Bayesian information criterion (BIC) would result in the same selection of variables.

et al. (2009) and conduct a likelihood ratio (LR) test defined by

$$2(l_u - l_r) \stackrel{a}{\sim} \chi_m^2, \quad (4)$$

where  $l_u$  represents the likelihood of the unrestricted model with the latent factor,  $l_r$  the restricted models without this factor and  $m$  the number of restrictions implemented. The only imposed restriction is  $\lambda_i = 0$ .

### Is a Latent Factor Present in Aggregate Credit Risk?

To judge whether latent factors are statistically significant, chart 1 plots the likelihood ratio statistics for all models per sector, with the x axis representing the number of included predictors per model. Note that for each given number of explanatory variables, five models are estimated. The horizontal line in each plot represents the 99% critical value of the  $\chi^2$  distribution.<sup>22</sup> Thus, values above the line indicate a statistically significant contribution of the latent factor to the model fit and can thus be interpreted as evidence for the existence of an unobserved component. The results shown in chart 1 are quite surprising: While there is evidence for a latent factor in smaller models, i.e. models with about 1 to 7 explanatory variables, this evidence clearly vanishes when considering models of larger size.<sup>23</sup>

This behavior is similar in all sectors with the exception of construction. Especially in the production sector, any significant contribution of the estimated unobserved component series is lost early (in terms of model size). As the model fit obtained by the variables

selected by the algorithm alone is already rather high, it cannot be significantly improved by the unobserved component. A similar pattern is visible for the service, trade, transportation and tourism sectors.

The construction sector constitutes an exception in this context since here, including a latent factor results in a more persistent significant improvement of the model fit. However, for model sizes beyond a certain threshold the improvement of the model fit is insignificant in this case as well. We relate this finding to the fact that the construction sector mainly consists of corporates working in *structural* and *civil* engineering. While the main customers in structural engineering are households, a large portion of orders in civil engineering is publicly assigned and could thus cause the behavior of this sector to differ from that of other sectors.

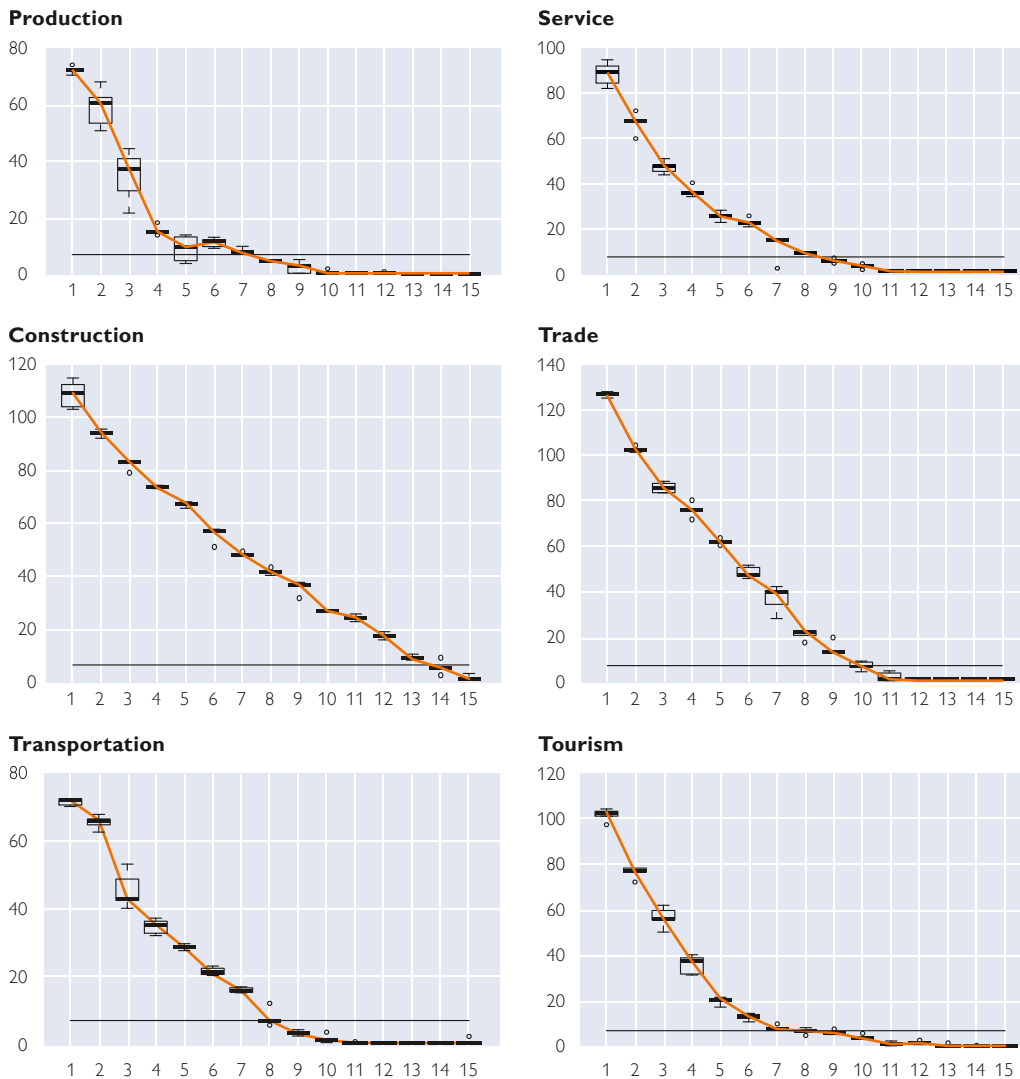
All in all, the results described above are somewhat surprising. On the one hand, it is obvious that the inclusion of more variables reduces the space that a time series estimated by the Kalman filter technique can fill. On the other hand, the model sizes discussed here are far from “large” and there is ample literature underlining the importance of the inclusion of a latent factor in the model (e.g. Lown and Morgan, 2004; Jimenez and Mencia, 2009; Koopman et al., 2009; and Bruche and Gonzalez-Aguado, 2010). One important distinction between our approach and e.g. the approach followed by Jimenez and Mencia

<sup>22</sup> From a strictly statistical point of view the results, especially the critical values resulting from the LR test, have to be taken with caution. First, they are only asymptotically valid. Second, we treat the likelihoods of the restricted models without explicitly conditioning them on the model selection criterion.

<sup>23</sup> To a very large extent, our LR test results can be confirmed by applying the BIC, which explicitly takes the length of the time series into account.

Chart 1

**Likelihood Ratio Statistics (y axis) versus Number of Included Explanatory Variables (x axis) for all Corporate Sectors (varying y scale)<sup>1</sup>**



Source: Authors' calculations.

<sup>1</sup> The black horizontal line represents the 99% critical value of the  $\chi^2$  distribution.

(2009) and Koopman et al. (2009) is that they selected variables by mere qualitative reasoning. The set of macroeconomic candidate predictors considered in previous work is generally smaller than in our models. Jimenez and Mencia (2009), for instance, only consider real GDP growth, interest rates and, in an enlarged set-up, also bond spreads and a sector-specific additional variable, while Bruche and

Gonzalez-Aguado (2010) only consider real GDP growth.

In a closer examination of the difference between previous findings in the literature and our findings, we set up a downsized macroeconomic environment in which we only include real GDP growth, short- and long-term interest rates and inflation – all up to six lags. With this much smaller macroeconomic variable set, we conduct Best

Subset Selection<sup>24</sup> for model sizes from 1 to 15 for each sector. Chart 2 presents the results, which are easily summarized: In all sectors there is substantial evidence of a significant improvement when considering the Kalman series *irrespective of the size of the model*. Clearly, our results show that an enriched dataset combined with a modern selection technique like Forward Stepwise Selection is able to capture dynamics that are otherwise deemed *unobserved*.

### Which Fundamentals Drive Aggregated Defaults?

An additional question is which macro-economic variables are selected by the forward selection algorithm. For this purpose, we point to chart 3 and table 2. Chart 3 presents the frequency with which estimated models contain a certain explanatory variable or its lagged cousin, thus indicating its importance in explaining aggregated defaults in the individual sectors. The respective red bar represents the fraction in which this variable has a positive coefficient.<sup>25</sup> Hence, in the construction sector, for instance, the variable HIC<sup>26</sup> (inflation) – or any of its lags – was selected in about 90% of all models and nearly always had a positive sign.

A closer look at chart 3 reveals interesting results. In all sectors but construction, funding costs such as the real short-term interest rate (STIReal), the real long-term interest rate (LTIReal) but also inflation (HIC) and real private credit growth (CPNReal) play an important role.

First, the explanatory variable LTIReal appears very frequently in models explaining defaults in the production, trade and tourism sectors. The sign of its coefficient is positive in the majority of cases, indicating rising defaults when LTIReal is high. Clearly, a higher interest rate raises the cost of funding in these sectors. In contrast, the service and transportation sectors seem to be affected by STIReal. An intuitive explanation for this finding is that these sectors rather tend to be financed by short-term lending and are thus more vulnerable to STIReal. While this interpretation seems plausible for the service sector, the negative signs of coefficients for the transportation sector suggest a different background: STIReal might be a timely indicator of economic activity. Hence, a reduction of STIReal, which is highly correlated with the central bank's target rate, might be a first indicator of an economic downturn, which would increase the default rate in the transportation sector.

Furthermore, in the same five sectors (all but construction) HIC has a positive influence on aggregate defaults in the majority of cases. As stated by Qu (2008), the role of inflation in firm defaults can be examined from two perspectives: first, the perspective of prices that companies charge for their goods and services and second, the perspective of factor prices. Higher prices of goods and services *ceteris paribus* increase earnings and thereby improve a company's creditworthiness. Higher factor prices lead to increased produc-

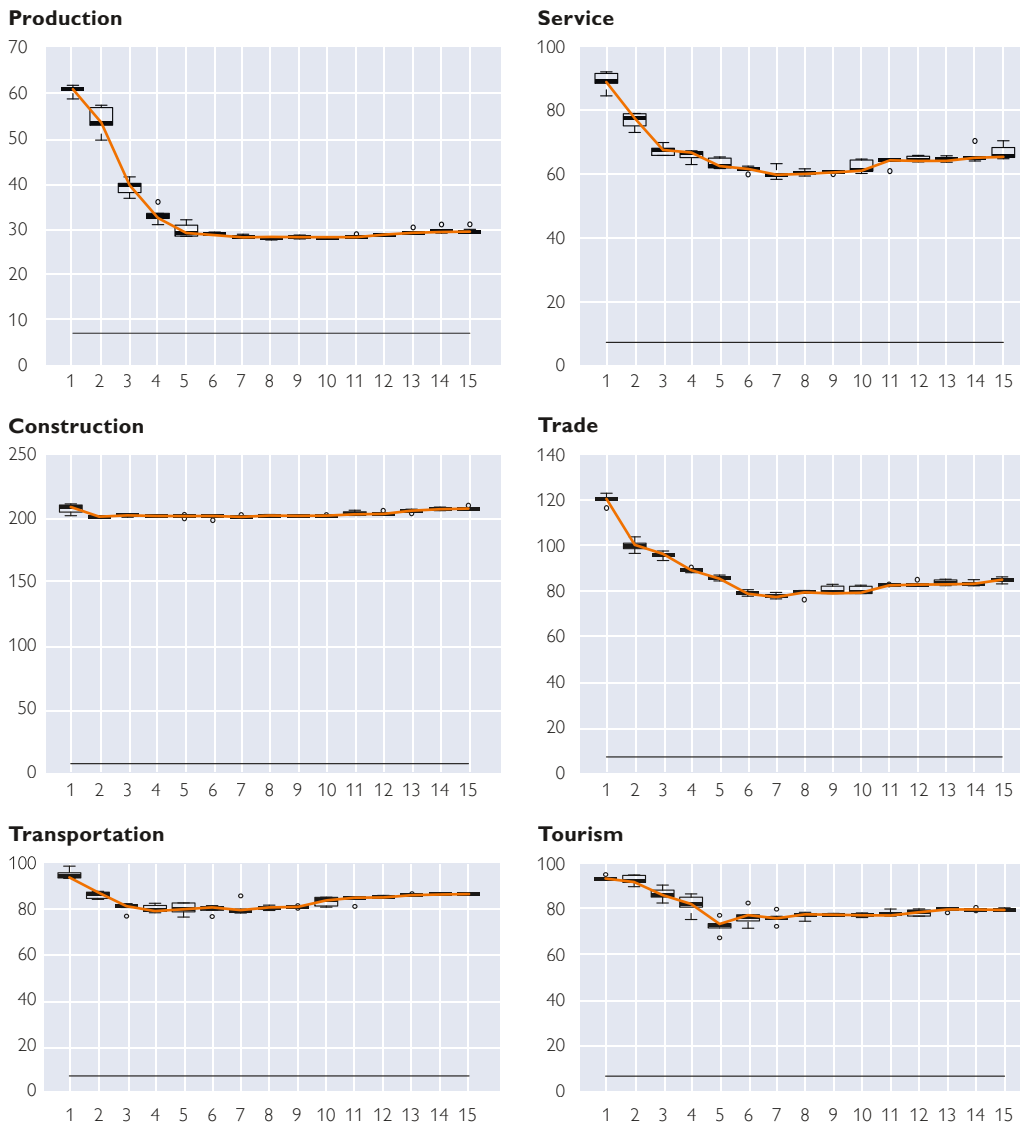
<sup>24</sup> We chose Best Subset Selection as it is computationally feasible for this smaller set of explanatory variables and superior to Forward Stepwise Selection since Best Subset Selection finds the optimal model among all possible models.

<sup>25</sup> In cases in which the algorithm chose a dynamic lag structure, i.e. the variable appeared more than once in one equation due to the lag specification, the red bar shows the number of models for which the sum of the respective coefficients is positive.

<sup>26</sup> Abbreviations as quoted in table 1 denote the variables transformed as indicated in the right-hand column of the table.

Chart 2

**Likelihood Ratio Statistics (y axis) versus Number of Included Explanatory Variables (x axis) for All Corporate Sectors (varying y scale)<sup>1</sup>**



Source: Authors' calculations.

<sup>1</sup> The black horizontal line represents the 99% critical value of the  $\chi^2$  distribution. It is important to note that here we only include four possible candidate predictors (STIReal, LTIReal, HIC and YER).

tion costs and tend to weaken creditworthiness – a fact which implies an increase in credit risk. Additionally, higher inflation is also a proxy of economic uncertainty. In our dataset, the second effect obviously dominates the first, leading to positive coefficients in the majority of models. In all six sectors, CPNReal has a solely negative

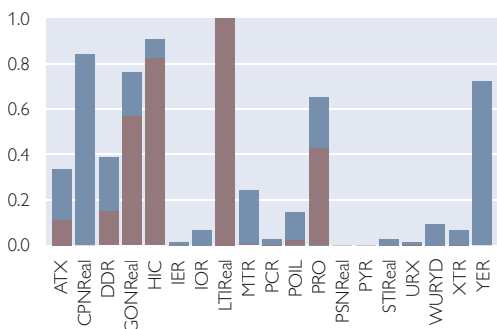
coefficient. Even in the construction sector, the model inclusion probability is above 30%.

Although this result is in line with Bonfim (2009), many studies on credit risk especially in developing economies search for a positive coefficient of credit growth. The theoretical assumption is that rapid credit growth in boom phases

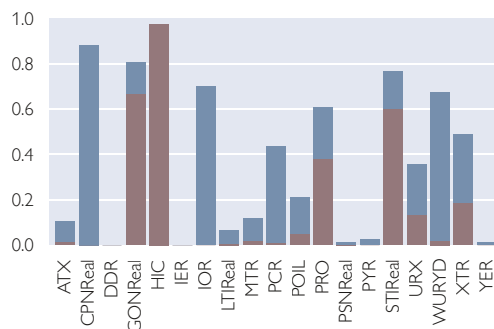
Chart 3

**Frequency of Selected Variables<sup>1</sup>**

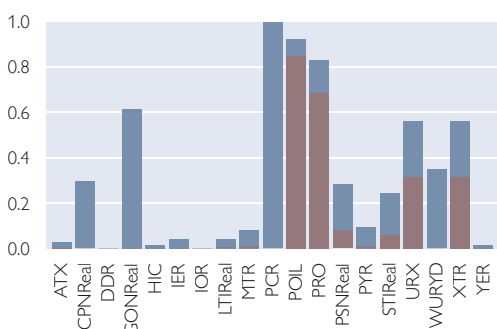
**Production**



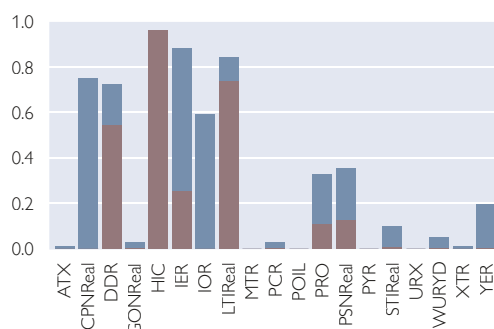
**Service**



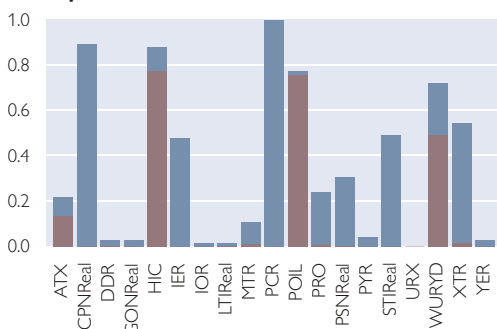
**Construction**



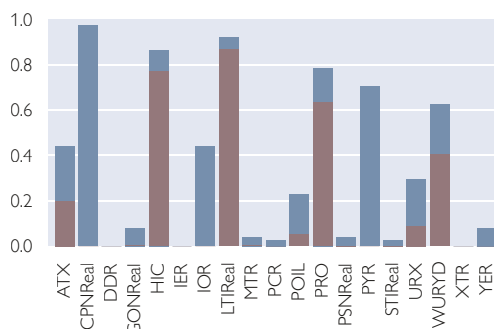
**Trade**



**Transportation**



**Tourism**



Source: Authors' calculations.

<sup>1</sup> Red bars show the fractions assigned to positive coefficients for the particular macroeconomic variable.

might lead to higher defaults in immediately following downturns.<sup>27</sup> With regard to the Austrian corporate credit market, we clearly cannot support this hypothesis. However, we do not include dummies for rapid credit growth and/or consider lags up to several years

as other studies do.<sup>28</sup> The negative sign in our results can be interpreted as follows: In good times, productive investment projects arise and companies might at least meet their short-term payment obligations – a circumstance

<sup>27</sup> See Jimenez and Saurina (2006) and Bank for International Settlements (2010).

<sup>28</sup> See Foos et al. (2010) and Berger and Udell (2004) among many others.



which, *ceteris paribus*, reduces the number of insolvencies.

Aside from the above, the variable YER (real GDP growth), is frequently selected with a negative sign in the production sector.<sup>29</sup> Moreover, the variable GONReal (real gross operating surplus growth), surprisingly, enters more than 70% of the production models with a positive sign. In the construction sector, the selection algorithm selected the variable PCR (real private consumption) with the expected negative sign in about 90% of all models. This highlights the influence of housing construction, a segment of construction whose main customers are households. Second, the variable POIL (oil price) enters over 90% of the models with a positive sign.

A particularly interesting finding is that the oil price also constitutes an important driver of defaults in the transportation sector as it defines the price of the main input good. In line with findings for other sectors, PCR is selected with the expected negative sign in more than 90% of the models. In addition, a further transportation-specific variable emerges: XTR (real export growth) proves to be important in the transportation sector. Clearly, more exports lead to more business activity and thus reduce the level of risk.

The aggregate insolvency rates in the service sector are influenced by a couple of variables, which reflects the fact that services consist of 38 different NACE sectors.<sup>30</sup> Aside from the general variables (STIReal, LTIRReal, HIC and CPNReal), the most prominent additional variables are the real growth of compensation per employee (WURYD)

as well as real other investment growth (IOR). The negative sign for WURYD indicates that households' income growth is a good proxy for more corporate revenues that lead to lower credit risk.

Additional variables in the trade sector are real equipment investment (IER) growth, real other investment (IOR) growth and real domestic demand (DDR) growth. As chart 3 shows, investment growth (IER, IOR) appears to be more important in the trade sector than in other sectors. In most models, the expected negative sign can be observed.

Finally, tourism is the only sector in which real private disposable income growth (PYR) is selected with a negative coefficient in more than 70% of the models. This clearly shows that households spend their higher disposable income on holiday activities, which causes revenues in the tourism sector to go up and insolvency rates to go down.

Summing up, we find a number of variables which drive ACR across multiple sectors and are thus particularly crucial for understanding ACR. These variables include inflation, interest rates and (negative) credit growth. Furthermore, we identify sector-specific variables, such as exports in the transportation sector or investment in equipment in the trade sector, which highlight the importance of taking sectoral differences into account when analyzing ACR in corporate sectors.

#### 4 Conclusions

This paper focuses on the determinants of aggregate credit risk (ACR). On the

<sup>29</sup> Interestingly, YER seems to be of importance only in the production sector. However, in many other sectors direct subcomponents of YER, such as XTR (real export growth) or PCR, are selected and indicate that the additional information contained in YER does not significantly contribute to explaining aggregate credit risk.

<sup>30</sup> See Zeller et al. (2008) for more details

Table 2

**Frequency of Selected Variables and Respective Fraction of Positive Coefficients**

	Production		Service		Construction		Trade		Transportation		Tourism	
	relative	+	relative	+	relative	+	relative	+	relative	+	relative	+
ATX	0.33	0.33	0.11	0.09	0.03	0.03	0.01	0.00	0.22	0.61	0.44	0.45
CPNReal	0.84	0.00	0.89	0.00	0.29	0.00	0.76	0.00	0.89	0.00	0.97	0.00
DDR	0.39	0.39	0.00	0.00	0.00	0.00	0.73	0.75	0.03	0.03	0.00	0.00
GONReal	0.76	0.75	0.81	0.82	0.61	0.00	0.03	0.03	0.03	0.00	0.08	0.04
HIC	0.91	0.91	0.99	1.00	0.01	0.00	0.97	1.00	0.88	0.88	0.87	0.89
IER	0.01	0.00	0.00	0.00	0.04	0.00	0.89	0.29	0.48	0.00	0.00	0.00
IOR	0.07	0.00	0.71	0.00	0.00	0.00	0.60	0.00	0.01	0.00	0.44	0.00
LTIRReal	1.00	1.00	0.07	0.07	0.04	0.04	0.85	0.88	0.01	0.01	0.92	0.95
MTR	0.24	0.01	0.12	0.12	0.08	0.08	0.00	0.00	0.11	0.11	0.04	0.04
PCR	0.03	0.01	0.44	0.01	1.00	0.00	0.03	0.01	1.00	0.00	0.03	0.00
POIL	0.15	0.15	0.21	0.22	0.92	0.92	0.00	0.00	0.77	0.99	0.23	0.23
PRO	0.65	0.65	0.61	0.62	0.83	0.83	0.33	0.34	0.24	0.03	0.79	0.81
PSNReal	0.00	0.00	0.01	0.01	0.28	0.28	0.36	0.37	0.31	0.01	0.04	0.01
PYR	0.00	0.00	0.03	0.00	0.09	0.08	0.00	0.00	0.04	0.00	0.71	0.00
STIRReal	0.03	0.00	0.77	0.78	0.24	0.24	0.11	0.05	0.49	0.00	0.03	0.03
URX	0.01	0.01	0.36	0.36	0.56	0.56	0.00	0.00	0.00	0.00	0.29	0.30
WURYD	0.09	0.00	0.68	0.03	0.35	0.00	0.05	0.03	0.72	0.68	0.63	0.64
XTR	0.07	0.03	0.49	0.38	0.56	0.56	0.01	0.00	0.55	0.03	0.00	0.00
YER	0.72	0.00	0.01	0.00	0.01	0.00	0.20	0.01	0.03	0.00	0.08	0.00

Source: Authors' calculations.

one hand, we explicitly measure the importance of latent risk factors via a state space system for different corporate sectors and model sizes. On the other hand, we evaluate the influence of observable macroeconomic variables in different corporate sectors by analyzing the choices of the Forward Stepwise Selection procedure.

We find that enhancing a macro-to-probability of default model by incorporating a latent risk factor only improves the model considerably if the model is allowed to select from a small number of possible predictors. We show that this finding is not explained by the selection procedure applied but is attributable to a limited set of variables. The limited number of included variables also explains why some of the relevant literature finds strong support for including unobserved risk factors in macro-to-probability of default models.

As pointed out in the introduction, the literature has not yet agreed upon a

meaningful economic interpretation of the credit cycle as an unobserved credit risk factor. Mainly on the basis of the likelihood ratio tests performed, we conclude that the significance of the explanatory value of the unobserved factor depends on the number and quality of the macroeconomic variables that are selected as predictors. Since the results for the construction sector show that influential observable predictors might not always be available, there is (state) space open to different credit cycle theories. At the same time, the inclusion of an unobserved component into an ACR model comes at little methodological costs. When forecasting aggregate levels of credit risk, it therefore seems to be prudent to work with a state space model.

Coming back to the *credit cycle* theories mentioned in the introduction, we think that the second theory, which assumes that (too) lenient credit standards during an economic upturn result

in the build-up of high credit risk which then materializes in the ensuing economic downturn, does not apply to the highly competitive Austrian banking sector.<sup>31</sup> This view is supported by the negative coefficient of credit growth (CPNReal) in all corporate sectors observed. Since this paper analyzes the Austrian corporate sector, we are not in the position to judge whether the credit cycle can be interpreted as the leverage cycle, which would require the modeling of ACR for mortgage loans in the retail sector. Finally, among the above-mentioned credit cycle theories the cyclical default correlation hypothesis seems to be the most promising option in support of our findings. The persistent importance of the unobserved factor in the construction sector for different models sizes underpins this argument as direct ties between firms in the construction sector are often observed.

Moreover we find several variables which drive ACR simultaneously in a number of sectors and are thus particularly crucial for modeling ACR. These variables include interest rates, inflation and (negative) credit growth. However, there are also considerable sectoral dif-

ferences between the selected variables. Among the sector-specific variables we find e.g. the oil price and exports in the transportation sector, investment in equipment in the trade sector and short-term interest rates in the service sector. Most of the selected variables show the expected sign in the regressions performed and can be explained by general economic theory and/or by specific sectoral economic conditions. Overall, our analysis suggests that only an enlarged set of macroeconomic variables can explain ACR in a comprehensive way – and a comprehensive explanation of ACR is without doubt crucial for the development of macroeconomic scenarios for stress-testing exercises.

Our findings also clearly indicate that taking model uncertainty into account is of high importance in a field where, a priori, many regressors constitute candidate predictors for explaining ACR. We accounted for model uncertainty by estimating 75 models for each corporate sector. However, there are more sophisticated statistical methods to perform model averaging. In particular the concept of Bayesian model averaging could be a promising advancement for future research projects.

<sup>31</sup> *High competition in the lending market generally results in low net interest margins. These, in turn, require strict lending standards which generally rule out subprime lending.*

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# The Austrian Insurance Industry in CESEE: Risks and Opportunities from a Financial Stability Point of View

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Gernot Ebner,  
Raimund Korherr  
and Eva Ubl<sup>1</sup>

*This study gives an overview of the insurance market in Central, Eastern and Southeastern Europe (CESEE) in general and of the Austrian insurance groups' activities in the region in particular. Moreover, it deals with risk management issues and the challenges arising from the new EU regulatory framework, Solvency II. We identify the main risks and opportunities for insurance groups in this respect: While potential market growth rates and still higher margins represent the main opportunities, there is also evidence of some reputational as well as financial risks. Further, cross-border business activities also pose some challenges for the risk management of internationally active insurance groups. From a macroprudential perspective, the Austrian insurance groups' exposure to CESEE augments the exposure of Austria financial institutions to this region.*

*JEL classification: G22, F15*

*Keywords: Central, Eastern and Southeastern Europe, Insurance, Austria*

## 1 Introduction

Central, Eastern and Southeastern Europe (CESEE)<sup>2</sup> has been the key growth market for Austrian banks and insurance companies in recent years. Having put their activities on a broader basis and entered the market fairly early, Austrian businesses established a solid foundation in the region. Austrian banks and insurance companies have benefited from the catching-up process in financial services. However, besides generating positive effects, the expansion to CESEE has also implied risks to financial stability in Austria. The financial crisis has revealed that the sizeable exposure of Austrian financial institutions to the region plays an important role in the assessment of their soundness by other market participants. These assessments have often been rather undifferentiated, not reflecting the heterogeneity of the region and the

fundamental economic and financial conditions.

The Oesterreichische Nationalbank (OeNB) and the Austrian Financial Market Authority (FMA) have intensified their research and monitoring activities, not only in connection with banks but also as regards insurance companies; in the latter area, the OeNB focuses on aspects related to financial stability. The aim of this study is to shed light on the CESEE insurance markets and the Austrian insurance sectors' exposure to CESEE from a more macroprudential perspective. We identify risks and provide a general assessment. In section 2 we describe the structure and the characteristics of the insurance market in CESEE, in particular with regard to Austrian insurance groups. In section 3 we identify the main risks of the insurance market in CESEE, whereas section 4 focuses on

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<sup>2</sup> In this study, CESEE includes Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, FYR Macedonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Tajikistan, Turkey, Turkmenistan, Ukraine and Uzbekistan. Please note that for some of these countries continuous data series are not available.

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risk management issues. The impact of the upcoming new EU regulatory framework for insurance companies, Solvency II, on the CESEE business will be addressed in section 5.

## 2 Overview

### 2.1 Structure and Characteristics of the Insurance Market in CESEE

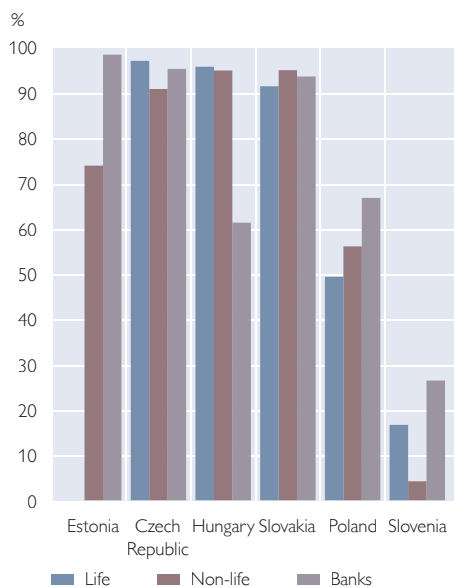
The insurance market in CESEE is relatively young. The privatization of the insurance sector started with the end of the communist regimes more than 20 years ago. The process of privatization and development took place at different speeds in the individual countries. It was not only Austrian insurers that entered the promising market but also most of the big European insurance groups, e.g. Aegon, Allianz, Aviva, AXA, Ergo, Generali or ING. The market share of foreign-controlled businesses is remarkably high in some

CESEE countries, especially in the Czech Republic, Hungary and Slovakia, where foreign-owned insurance undertakings hold market shares of more than 90%.<sup>3</sup> A similarly high level of foreign ownership can be observed in the CESEE banking sector, except for Hungary. The significantly higher premium and credit growth rates in CESEE compared with those in international financial institutions' rather saturated home markets have been an incentive to invest in the region. However, the negative impact of the financial crisis on premium and credit growth in CESEE and the resulting economic downturn was more pronounced in CESEE than in Western Europe, including Austria.

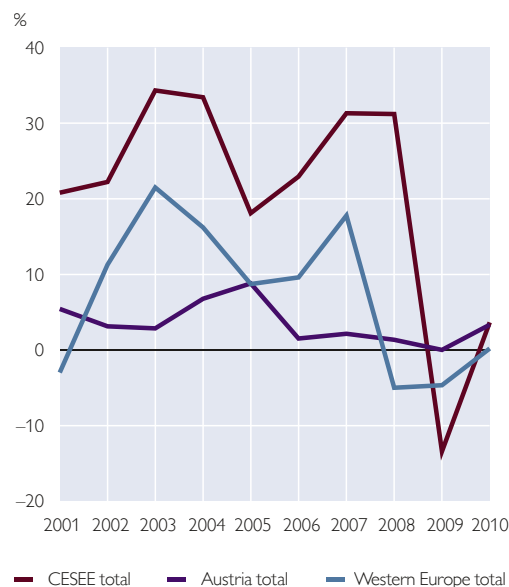
In 2010 the insurance market in CESEE<sup>4</sup> generated about USD 88.2 billion in premiums, which is 6% of the premiums generated by the Western European insurance market. The big-

Chart 1

#### Share of Foreign Ownership in Insurance Companies and Banks in CESEE



#### Premium Growth in CESEE and Austria from 2001 to 2010



Source: Swiss Re sigma, FMA, OECD.

<sup>3</sup> Source: OECD Insurance Data 2009.

<sup>4</sup> As a proxy for CESEE we use the Swiss Re sigma definition of Eastern Europe, which represents Central and Eastern Europe and does not include Turkey.



gest markets of the region are Russia with a share of 40%, Poland (20%) and the Czech Republic (9%). The insurance penetration level (premiums to GDP) in CESEE was still notably lower compared with the one in more developed regions (8.4% in Western Europe, 2.6% in Eastern Europe<sup>5</sup>). As a result of the financial crisis that broke out in 2008, the steady and high premium growth seen since 1989 came to a sudden and temporary end in 2009. However, economic recovery started to take hold in some countries already in 2010, while others still posted negative premium growth in 2010.

The non-life insurance sector grew by 2.7% (in nominal terms) in 2010, after contracting by 7.5% in 2009, still suffering from the impact of the crisis. A strong recovery could only be observed in Poland and Ukraine. Insurance penetration in the non-life sector in CESEE is closer to Western European levels (2% in Eastern Europe, 3.1% in Western Europe) than in the life insurance sector. As the non-life insurance market is more saturated than the life insurance sector, the growth potential of the former over the longer run is expected to be lower than that of the latter.

The life insurance sector recovered and grew by 9% in 2010 (after shrinking by a hefty 30% in 2009), mainly driven by the rise in premiums in Russia, the Baltics and in the Czech Republic. However, in the Czech Republic and in Hungary, life insurance premium growth was driven mainly by single premium products, which tend to be more volatile. In the life insurance sector, the catching-up process is

just starting in some countries; in others, such as Hungary, Poland, Slovakia and the Czech Republic, the share of the life insurance business in the entire insurance business is already at the same level as in Austria.<sup>6</sup>

Life insurance penetration in most of the CESEE countries is between 0.1% and 2% of GDP, which is clearly lower than the Western European average (5.3%) and even the Austrian ratio of 2.7%. The demand for life insurance policies depends on the public pension system, the confidence in its sustainability and households' wealth and income. In some countries like Hungary and Slovakia, unit-linked life insurance products, where the investment risk is borne by the policyholder, account for a very high market share compared to the situation in Austria or Germany. Key indicators of the insurance industry in CESEE confirm once more the fact that the region is heterogeneous. The most developed markets according to the available indicators are Slovenia, the Czech Republic, Poland and Slovakia, whereas the catching-up potential is higher in Romania and the Baltic countries, for instance.

In the following, insurance premium growth will be estimated applying a panel regression (cross-section with fixed effects), where real premium growth was explained by GDP growth.<sup>7</sup> The growth potential of the insurance market in CESEE is closely connected with economic growth in the region. According to the GDP forecast in the IMF World Economic Outlook April 2011, GDP growth will gain hold in CESEE but will remain subdued until 2016 (end of projection period) com-

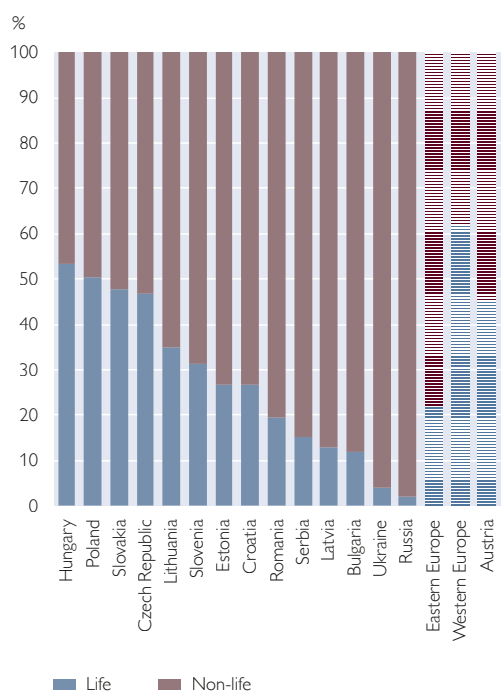
<sup>5</sup> Source: *Swiss Re sigma*.

<sup>6</sup> In Austria, the share of life insurance policies has always been lower than in the rest of Western Europe due to the traditionally strong first pillar of the Austrian pension system.

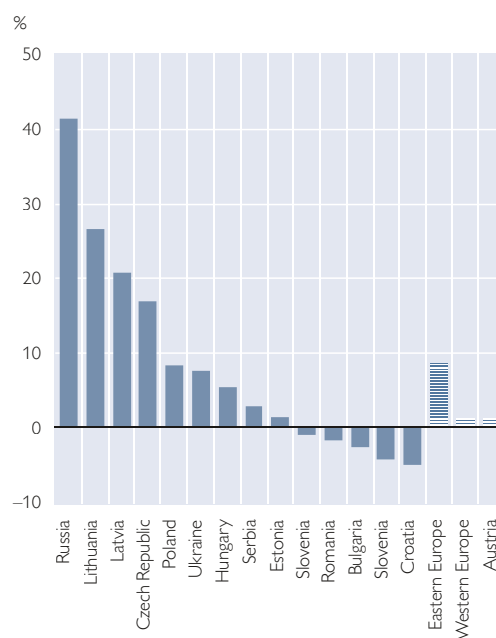
<sup>7</sup> See table A1 in the annex for estimation results.

Chart 2

### Proportions of the Life and Non-Life Insurance Sectors in CESEE



### Life Insurance Premium Growth Rates in 2010



Source: Swiss Re sigma 2010.

Table 1

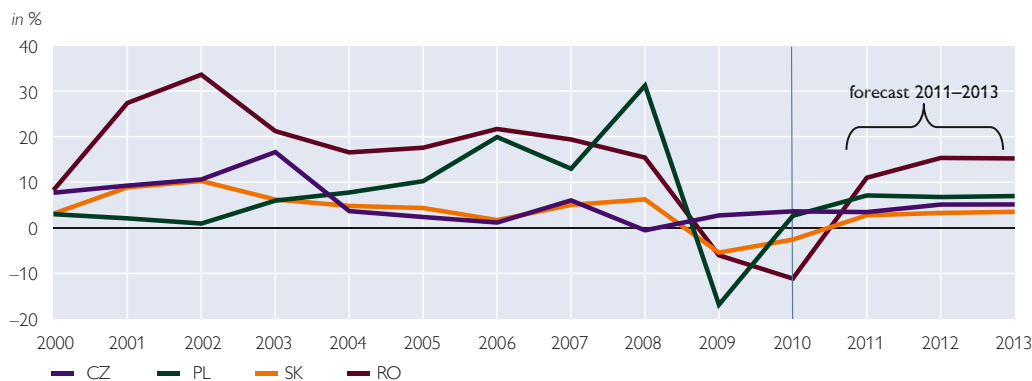
### Structure of the CESEE Insurance Market in 2010

	Insurance penetration	Premium growth	Insurance penetration, non-life segment	Premium growth, non-life segment	Insurance penetration, life segment	Premium growth, life segment	Proportion of unit-linked insurance policies, life insurance segment
%							
Slovenia	5.9	1.0	4.1	-0.4	1.8	-1.1	61.3
Czech Republic	4.0	4.9	2.1	-3.9	1.9	16.9	40.1
Poland	3.7	5.4	1.8	6.2	1.9	8.3	21.6
Hungary	3.0	3.0	1.4	-2.4	1.6	5.3	61.0
Slovakia	3.0	-1.9	1.5	-4.0	1.5	-4.4	28.1
Croatia	2.8	-1.8	2.0	-1.9	0.7	-5.1	n.a
Bulgaria	2.5	-2.7	2.2	-2.7	0.3	-2.7	n.a
Russia	2.3	6.5	2.3	5.9	0.0	41.7	n.a
Ukraine	2.2	12.9	2.1	13.1	0.1	7.6	n.a
Estonia	2.0	-5.5	1.5	-9.2	0.5	1.3	43.8
Serbia	1.8	5.6	1.5	3.6	0.3	2.8	n.a
Romania	1.7	-5.7	1.4	-7.5	0.3	-1.7	n.a
Lithuania	1.7	18.1	1.1	11.5	0.6	26.6	66.2
Latvia	1.5	-14.8	1.3	-18.7	0.2	20.7	12.5
Eastern Europe	2.6	4.0	2.0	2.7	0.6	8.6	n.a
Western Europe	8.4	0.2	3.2	-1.3	5.3	1.1	n.a
Austria	5.9	2.1	3.2	2.3	2.7	1.1	34.5

Source: Swiss Re sigma 2010, IMF World Economic Outlook April 2011, OECD Insurance Statistics.

Note: The four countries highlighted are those accounting for the highest exposures of Austrian insurance companies in CESEE.

### Real Premium Growth in Selected CESEE Countries<sup>1</sup> from 2000 to 2010 and Forecast for 2011 to 2013



Source: Authors' calculations, Swiss Re sigma, IMF World Economic Outlook April 2011.

<sup>1</sup> These four countries account for the highest exposures of Austrian insurance companies in CESEE.

pared to pre-crisis levels. The estimate should serve as a rough indication of the development of the insurance sector in CESEE. The estimation results for real premium growth show that the outlook is positive but in general less dynamic than before 2007. Among the countries where the exposure of Austrian insurance companies is highest (the Czech Republic, Poland, Slovakia, Romania), Romania shows the highest growth potential. However, higher growth is often related with higher risk, which implies that in case of an economic downturn, premium growth rates might decrease equally strongly. Furthermore, heightened financial market tensions and weakening economic conditions in advanced economies could considerably slow down insurance growth.

A correlation analysis shows that in most CESEE countries premium growth is significantly positively correlated with credit growth, which is a result of the underlying dependency of

both variables on GDP growth.<sup>8</sup> For instance, mortgage loans are often covered by life insurance policies and result in an increase in home insurance policies, while a rise in car loans or lease contracts might lead to an increase in motor insurance policies.

Since 2010 the macrofinancial conditions in CESEE have reflected signs of an economic recovery, while at the same time the differences in the speed and the sustainability of the upswing confirm the heterogeneity of the region. It has benefited from the recovery of the world economy, developments in the commodities markets and, in particular, from the relatively benign economic conditions in Germany, one of its main trading partners. Macroeconomic indicators for the region show that the economy grew in most of the countries in 2010. Given the sovereign debt crisis in some euro area countries as well as high levels of foreign currency loans and elevated unemployment rates in some CESEE countries,

<sup>8</sup> Significant linear correlations between premium and GDP growth have been found in Bulgaria, Croatia, Hungary, Latvia, Poland, Romania and Russia. No correlations have been found in Slovakia, Slovenia, Ukraine and the Czech Republic (time series: 2000 to 2010).

Table 2

**Selected Macroeconomic Indicators for CESEE in 2010**

	Credit growth	GDP growth	Total savings to GDP	Unemployment rate	General government gross debt to GDP
	%				
Slovenia	1.9	1.2	22.2	7.2	37.2
Czech Republic	3.2	2.3	19.9	7.3	39.6
Poland	8.5	3.8	17.3	9.0	55.7
Hungary	3.3	1.2	19.4	11.2	80.4
Slovakia	4.3	4.0	20.2	14.4	42.0
Croatia	6.8	-1.4	21.7	12.3	40.0
Bulgaria	1.4	0.2	24.1	10.3	18.0
Russia	13.3	4.0	24.7	7.5	9.9
Ukraine	1.2	4.2	17.8	8.1	40.5
Estonia	n.a.	3.1	23.5	16.9	6.6
Serbia	26.6	1.8	14.8	19.4	44.0
Romania	5.0	-1.3	22.2	7.6	35.2
Lithuania	n.a.	1.3	18.7	17.8	38.7
Latvia	-7.6	-0.3	24.2	19.0	39.9
Eastern Europe	n.a.	4.2	16.7	n.a.	46.9
Western Europe	n.a.	n.a.	n.a.	10.0	85.0
Austria	0.8	2.0	25.1	4.4	69.9

Source: IMF World Economic Outlook April 2011.

Note: The four countries highlighted are those accounting for the highest exposures of Austrian insurance companies in CESEE.

the economic growth outlook for the region is rather uncertain and fragile. As public sector indebtedness is lower in CESEE than in advanced economies, public debt should have fewer direct negative effects on the economy. However, new public borrowing expanded more strongly in the course of the crisis and the necessary consolidation of public debt could have some decelerating effects on growth rates.

In view of the macroeconomic environment, the conditions for a deepening of the insurance market in CESEE and further growth are in place, and the outlook is generally positive. However, it is unlikely that growth rates will return to the unsustainably high levels observed before the crisis, as the external environment is more uncertain than in the past. As a result, the profitability outlook is positive, but tilted to the downside. Also, due to higher uncertainty and the challenge of maintaining a high risk-bearing capac-

ity, CESEE subsidiaries' profit distribution to shareholders could be lower than in the past.

## 2.2 Austrian Insurance Companies in CESEE

Austrian insurance companies started their expansion nearly 20 years ago. Since 2000, expansion in foreign markets has been driven by entering various insurance markets through greenfield operations or mergers and acquisitions. Right from the beginning, CESEE has been the clear geographical focus of expansion. At end-2010, Austrian insurance companies operated 100 subsidiaries in more than 26 countries in the region. A total of five Austrian insurance groups (Vienna Insurance Group, Uniqa, Grazer Wechselseitige, Wüstenrot and Merkur) headquartered in Austria are currently active in CESEE.

Establishing branches or using the opportunity of the free provision of

Table 3

### Change in the Number of Austrian Insurance Subsidiaries in CESEE from 2002 to 2010

	2002	2004	2006	2008	2010
Albania			1	2	4
Bosnia and Herzegovina	1	3	4	4	4
Bulgaria	3	3	7	9	9
Belarus	1	2	3	2	1
Czech Republic	6	6	7	7	8
Croatia	5	7	9	9	9
Hungary	9	8	8	6	6
Montenegro				4	5
Poland	10	7	9	9	9
Romania	4	5	8	8	8
Russia			3	4	2
Slovenia	3	3	4	3	3
Slovakia	7	8	8	6	6
Serbia	2	2	3	5	6
Ukraine	1	2	5	9	9
Other	2	3	4	8	11
Total	54	59	83	95	100

Source: FMA.

services within the European Economic Area played only a minor role in Austrian insurers' CESEE business. The gross written premium volume generated by subsidiaries amounted to EUR 8.2 billion at end-2010, while branches and the free provision of services accounted for premiums of EUR 0.8 billion.

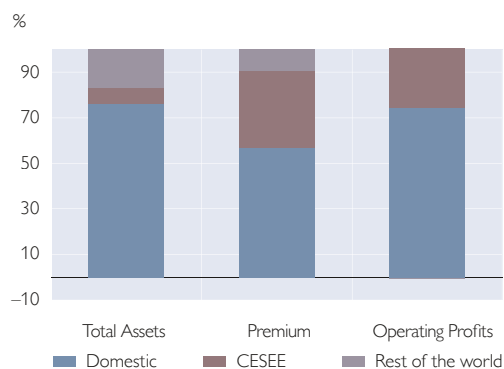
The EUR 8.2 billion in gross written premiums generated in 2010 corresponds to a share of 43% in these insurers' total business,<sup>9</sup> thereof 34% (i.e. EUR 6.4 billion) are generated in CESEE. These figures show that in terms of business volume, CESEE is much more important to Austrian insurers than their foreign business in Western Europe. The CESEE business' share in Austrian in-

<sup>9</sup> In the following analysis, all licensed Austrian insurance companies have been included that have participations in one or more insurance subsidiaries outside Austria.

<sup>10</sup> However, it has to be borne in mind that the explanatory power of total assets may be different for life insurance companies and non-life insurance companies due to the differences in the composition and maturity of their portfolios.

Chart 4

### Austrian Insurance Groups' Business by Region 2010



Source: FMA.

surers' total profitability as measured by operating results amounted to 26%, while Western European activities posted a loss in 2010. This can mainly be attributed to reinsurance losses resulting from the covering of claims arising from natural disasters.

Total assets figures also illustrate the significance of the CESEE subsidiaries' business.<sup>10</sup> At the end of 2010, the total assets of Austrian insurance companies amounted to EUR 85.6 billion, with the share of the CESEE business coming to almost 17%. This relatively small share compared to that in premiums and operating results reflects the fact that the life insurance business in CESEE is still at an early stage and the high share of the non-life business in CESEE.

Taking a longer-term perspective, the share of premiums earned in CESEE increased steadily over the last three years, while the CESEE business' share in total operating results decreased, as Austrian insurers' results were particu-

Table 4

### Key Indicators of Austrian Insurance Groups' Business in CESEE from 2008 to 2010

	2008	2009	2010
<i>EUR million</i>			
Gross written premiums, total	20,583	20,482	18,909
of which: gross written premiums, Austria	13,283	13,106	10,714
gross written premiums, CESEE	5,690	5,855	6,402
Share of CESEE business in %	27.6	28.6	33.9
Operating results, total	595	848	941
of which: operating result, Austria	327	541	699
operating result, CESEE	249	258	247
Share of CESEE business in %	41.9	30.5	26.3
Total assets, total	87,802	93,532	85,557
of which: total assets, Austria	72,115	75,614	64,949
total assets, CESEE	11,004	12,662	14,389
Share of CESEE business in %	12.5	13.5	16.8

Source: FMA.

Note: The decline in Austrian premiums from 2009 to 2010 is due to the fact that Generali Group Austria has no longer been included in group statistics from 2010 onward as all significant cross-border subsidiaries of this group were sold.

larly low in 2008. All in all, aggregate premiums and operating results in CESEE proved to be remarkably stable during the crisis.

In CESEE, the following four countries play a key role for Austrian insurers: the Czech Republic, Poland,

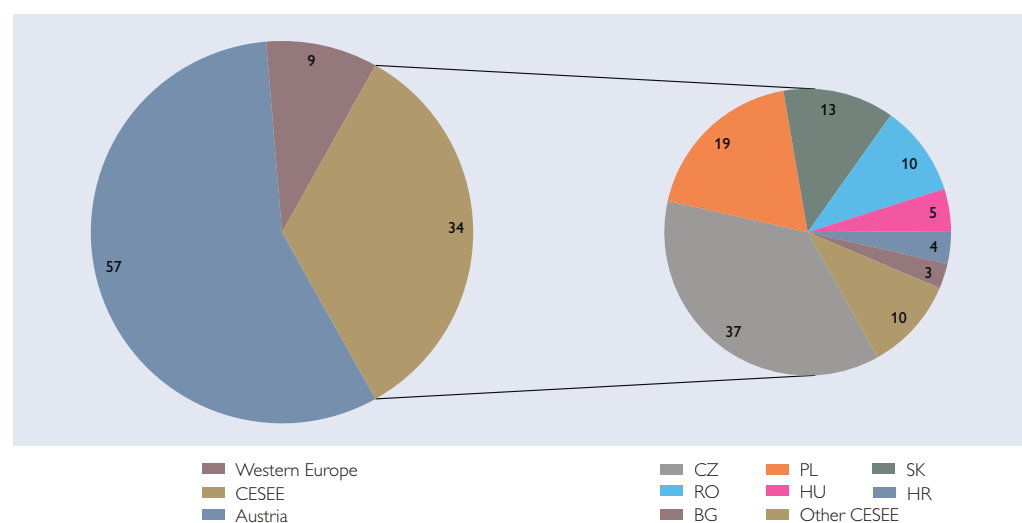
Slovakia and Romania. These countries account for more than 78% of Austrian insurers' CESEE premiums.

As the analysis of the CESEE insurance markets (see section 2.1) shows, CESEE markets differ significantly in terms of size and development of the

Chart 5

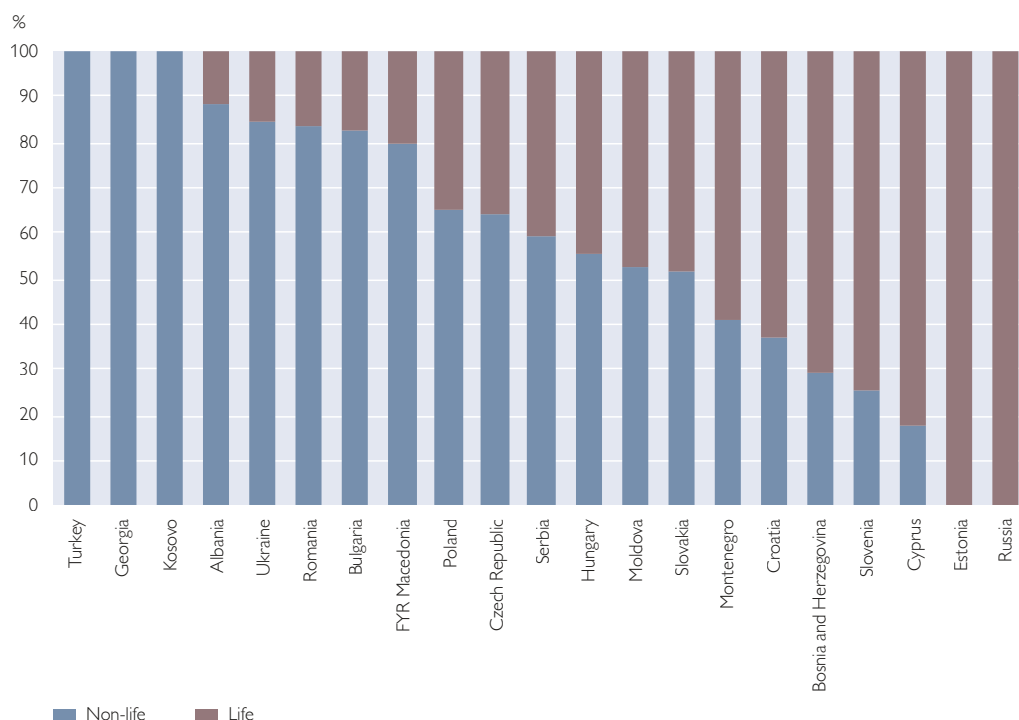
### Distribution of Premiums by Region and Country

%



Source: FMA.

Chart 6

**Distribution of Premiums in the Life and Non-Life Segments by Country in 2010**

Source: FMA.

life and non-life insurance sectors. Austrian insurance companies provide life and non-life insurance products in most countries, but the contribution of non-life insurance premiums to the total premium volume is considerably higher than that of life insurance premiums.

### 2.3 Asset Allocation of CESEE Insurance Companies

Besides banks, mutual funds and pension funds, insurance groups are the major investors in financial securities. Premium growth provides insurers with higher investment capital; this causes positive second-round effects in the deepening of the local financial market, provided that at least part of the capital is invested in domestic securities. The stock and bond markets in CESEE are still underdeveloped compared to Western European standards. Table 5 compares the global bond

market to the markets in Austria, the Czech Republic and Poland. It can be observed that the share of government bonds in the total volume of bonds outstanding in Poland (96%) and the Czech Republic (66%) is significantly higher than in Austria (38%) and higher than the share of government bonds in the total amount of bonds worldwide (58%). By contrast, bonds issued by financial institutions in Poland and the Czech Republic play only a very small role in the domestic debt securities markets.

Local debt investment by insurance companies in CESEE is restricted by limited supply; therefore, insurers mainly invest in government bonds. By comparison, only 4.2% of Austrian insurance companies' security investments (at solo level) were Austrian government bonds, while securities issued by Austrian banks accounted for



Table 5

### Amount of Outstanding Debt Securities as at December 2010

	All issuers	Government	Financial institutions	Corporates
USD billion				
All Issuers	67,154	38,960	21,522	6,671.9
Austria	352	135	173	44
Poland	202	194	8	x
Czech Republic	74	49	16	9.2

Source: BIS Quarterly Review June 2011, Statistical Annex p. A114, Table 16A, 16B.

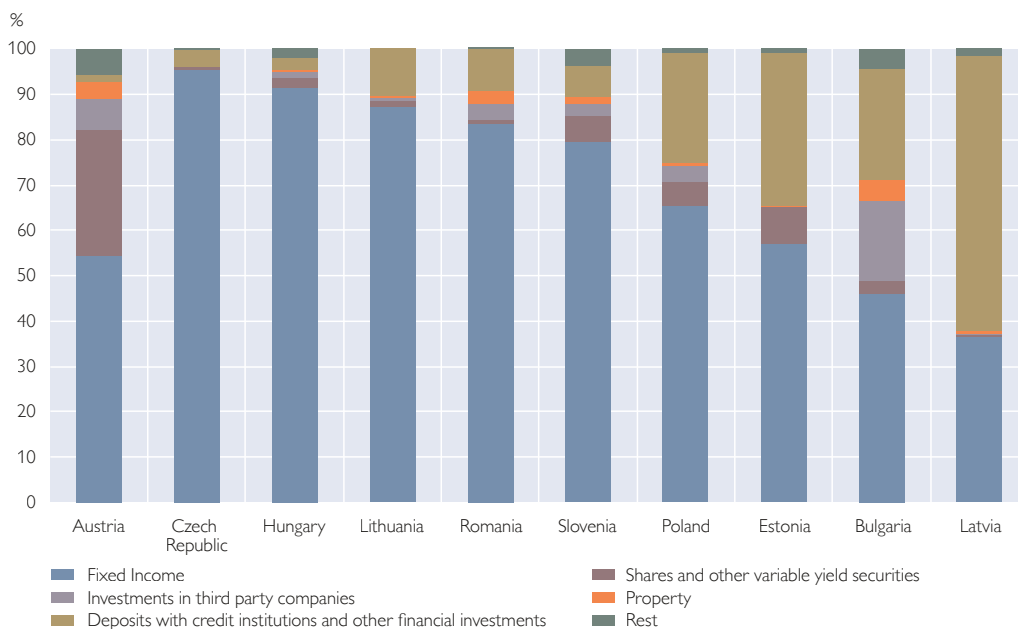
19% at the end of 2010. Clearly, the supply of financial issuers is quite limited in CESEE countries. On a positive note, this reduces the risk of contagion from the domestic financial sector. As government bonds with a maturity lon-

ger than ten years are hardly issued in CESEE, asset liability management at CESEE insurance companies in the domestic market is challenging.

It can be observed that the asset allocation of insurance companies is quite heterogeneous, but fixed income securities seem to play a slightly more important role in CESEE than for instance in Austria.<sup>11</sup> The high portion of fixed income securities causes a high exposure to interest rate and credit risk. Low interest rates make it more difficult to gain profits especially out of life insurance products with guaranteed interest. However, a rise in interest rates leads to lower market values of fixed income securities. A more conservative investment policy definitely makes investment profits more calculable and less volatile.

Chart 7

### Asset Allocation of Insurance Companies in Austria and CESEE in 2009



Source: EIOPA.

Note: Percentage shares represent asset class to total investments excluding unit-linked insurance assets.

<sup>11</sup> Source: Statistical Annex 2009, CEIOPS Financial Stability Report 2010.

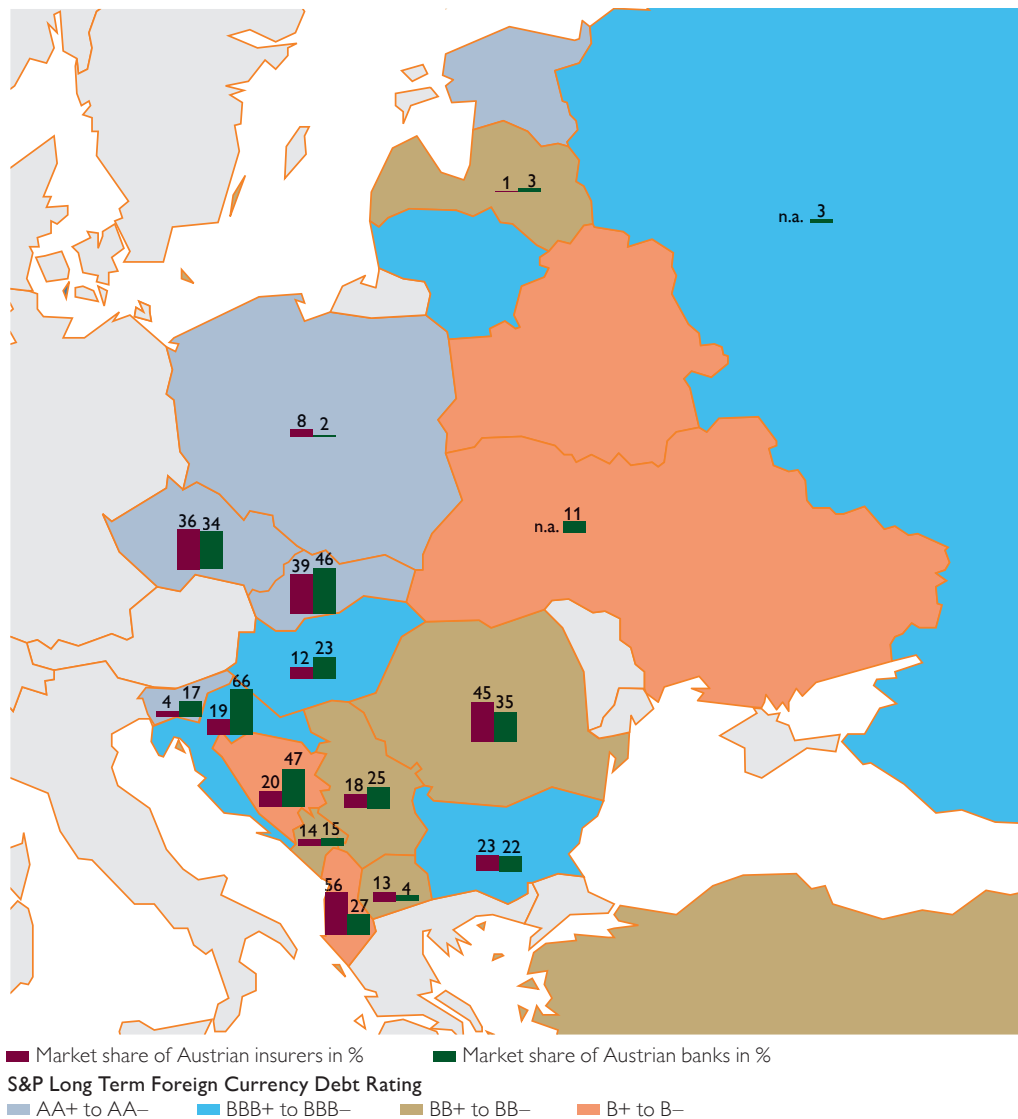
### 2.4 Comparison of Austrian Banks and Insurance Companies in CESEE

Both Austrian banks and insurance groups are important players in CESEE, which entered the market early. The aggregate exposure of Austrian banking groups (majority domestic owned) to CESEE amounted to around EUR 210

billion at the end of 2010, while the total assets of Austrian insurance companies in CESEE stood at EUR 14.3 billion. The much lower exposure of Austrian insurers reflects the traditionally different business models of banks and insurance companies and the stage of development of the insurance and banking markets. Nonetheless, Austrian in-

Chart 8

#### Market Shares of Austrian Banks (2010) and Insurance Companies (2009) in CESEE and Country Risk Assessments



Source: OeNB, FMA, S&P.

Note: Banks' market shares were calculated on the basis of total assets, insurance groups' market shares on basis of premium income.

Table 6

### Shares of Austrian Banks' and Insurance Companies' Exposure in CESEE by Region

	Banking sector	Insurance sector
	%	
NMS 2004 <sup>1</sup>	55.4	73.3
NMS 2007 <sup>2</sup>	16.2	9.9
SEE	18.7	15.1
CIS	9.6	1.7

Source: FMA, OeNB.

<sup>1</sup> Member States that joined the EU in 2004: Czech Republic, Estonia, Hungary, Lithuania, Poland, Slovakia, Slovenia.

<sup>2</sup> Member States that joined the EU in 2007: Bulgaria, Romania.

insurance companies command a CESEE market share of around 9%,<sup>12</sup> which is at a similar level to Austrian banks' market share of 9.4%.<sup>13</sup>

To compare the significance of the CESEE business for Austrian banks and insurers we set the share of insurers' and banks' CESEE assets into relation to their total assets. We find that whereas Austrian banks' CESEE total assets amount to 37% of their total assets, the share is 17% for insurers (40% for insurers on the basis of premium income). Given the growth potential in CESEE, the shares will increase over time for both banks and insurers.

Austrian insurers' business activities are more widespread in the region: They are active in 26 CESEE markets, while Austrian banks own subsidiaries in 19 markets. However, Austrian insurers have a relatively higher exposure to CESEE EU countries, including the Czech Republic and Poland, where the macrofinancial conditions are more stable and economic fluctuations less volatile. By contrast, Austrian insurers'

aggregate relative exposure to countries in Southeastern Europe (SEE) and the Commonwealth of Independent States (CIS), where political and economic vulnerabilities are more pronounced,<sup>14</sup> is lower than that of Austrian banks.

### 3 Risks and Opportunities in the Insurance Business in CESEE

This section will discuss the risks insurance companies are facing in CESEE other than the typical insurance-related risks such as weather-related large claims payments in the non-life sector or demographic change in the life sector. In other words, the focus will be on business risks specifically connected with CESEE.

As we have already pointed out, the developing CESEE insurance market still holds growth potential. All major European insurance companies are currently active in CESEE, which has tentatively increased competition. Although the margins are still relatively high, they have declined over the last years, for instance in the non-life segment, and here particularly in the car insurance business. Over the longer term a high level of competition could lead to accelerated consolidation in the CESEE insurance market, which might result in market exits of financially less sound players, or mergers and acquisitions and more risk-sensitive pricing, which would contribute to a more stable outcome in terms of financial stability.

So far the consolidation process has neither led to elevated uncertainty nor contributed to disruptions in some insurance services or higher volatility. To

<sup>12</sup> Calculations based on premium income (source: Swiss Re and FMA).

<sup>13</sup> Calculations are based on total assets, excluding UniCredit Bank Austria (the market share would be more than 13% if UniCredit Bank Austria were taken into account).

<sup>14</sup> SEE includes Albania, Bosnia and Herzegovina, Croatia, Montenegro, FYR Macedonia, Serbia, Turkey. CIS includes Armenia, Azerbaijan, Belarus, Georgia, Kyrgyzstan, Kazakhstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.

some extent this may be due to the fact that the CESEE region is perceived to be a growth market. According to CEIOPS (2010), market concentration tends to be higher in CESEE EU countries (with the share of the five biggest insurers in total gross written premiums in the domestic sector coming to between 50% and 80%) than in big EU Member States like Germany, France and Italy, or in Austria, where the market is more fragmented (with the five biggest insurers holding a market share of between 35% and 50%). The reason for market concentration in CESEE to be higher is that formerly publicly owned insurers still have a strong market position. Depending on the degree of market consolidation, concentration could even increase, as some insurance companies become even bigger and therefore potentially systemically more important in these countries.<sup>15</sup>

The high growth rates – albeit starting from low levels – in the run-up to the global financial and economic crisis are evidence of the growth potential of the insurance market in CESEE. Economic growth, households' increasing purchasing power and corporate investment led to brisk demand for insurance services. In other words, there has also been catching up in demand as compared to the more developed Western European insurance markets. Rapid premium growth, efforts to maintain and gain market share and expectations of high future growth rates have contributed to the formation of – potentially complex – group structures. Such groups and the risks they have assumed may be difficult to manage in particular in periods of high growth rates.

Market intelligence suggests that the acceleration of sales of insurance

products, in particular of unit-linked life insurance policies, through independent brokers plays a prominent role in the distribution channel. It could, however, pose some medium-term risks to insurance companies, as the high commissions paid to independent brokers may be an incentive to aggressively sell insurance products which are not tailored to the needs of the policyholder. The sale of policies through independent brokers could thus contribute to misselling and therefore to reputational and, eventually, financial risks for the insurance company. Reputational and financial risk could also arise for companies that have sold unit-linked life insurance products, where policyholders bear market, credit and interest rate risks. These risks could be amplified by marketing products with overly optimistic return expectations, not very diversified and risky underlying stocks or other exposures and the distribution through independent brokers as described above. Market intelligence indicates that in some cases life insurance products served as repayment vehicles for foreign currency loans and were linked with high performance expectations. Although this has not been a widespread phenomenon in CESEE, it can nevertheless contribute to reputational risk for insurance companies.

Insurance companies use banks as distribution channels in particular for life insurance products. Banks and insurance companies benefit from each other by cooperating closely. Aside from the positive effects in terms of income generation and acquisition of new clients, this also reinforces the ties between them and makes both more vulnerable, for instance when the sentiment towards one of the other turns negative.

<sup>15</sup> It has to be taken into account that premiums written by branches are not reflected in the data used and are therefore not considered in this analysis.

Aside from the previously mentioned reputational and business risks, which are more related to emerging than saturated insurance markets, there are also the risks of insurance fraud and poor law enforcement, which could give rise to financial risk. These risks and their interplay are particularly relevant in third countries with a weaker institutional and legal framework. As confidence in the insurance sector is rather limited in some countries, the risk arises that insurance claims tend to be settled in a way that favors policyholders; in this way, insurers may “invest” in reputation.

The political risks in CESEE are elevated and have materialized in some countries in the recent past. For instance, although insurance companies have not contributed to the financial crisis, in Hungary they are now facing – at least temporarily – levies, which put pressure on their profitability. As a result, insurers will find it difficult to improve their risk-bearing capacity, which, however, would be conducive to attaining financial stability in the CESEE EU Member States, also in view of Solvency II.

The global financial crisis has not only revealed gaps in the macroprudential policy toolkit as regards systemic

risk and cross-border businesses, it has also shown that the supervision of financial institutions can only be effective when the institutional framework is strong enough to ensure a policymaker’s (supervisor’s) ability and willingness to act (IMF, 2011). That is easier said than done, because there are some incentives which counteract this intuitive objective. The benefits of policy measures typically show rather gradually over the longer term, whereas costs or slower growth often show immediately. This can create a strong bias in favor of inaction, which can be exacerbated by industry lobbying or political pressure.

#### 4 Participations und Risk Management

In view of the above-mentioned risks, it is essential to have appropriate strategies, processes and procedures in place to adequately manage these risks. Chart 9 shows the hierarchy of the relevant strategies.

On top of the hierarchy there is a company’s business strategy, which defines the nature and scope of the business lines, the basic objectives (e.g. intended market share) and the expansion and integration strategy (e.g. buying existing insurance companies or build-

Chart 9

#### Hierarchy of Strategies



Source: FMA.

ing from scratch, accepting majority or only 100% holdings, pursuing a single or a multi-branding strategy). Normally, the supervisory board has to approve this strategy.

On the next level there is the risk strategy (sometimes part of the governance guidelines) defining how the business strategy should be implemented in terms of risk, including the setup of group-wide risk management, internal control and reporting systems and the corresponding steering committees.

The group strategy (a part of the overall investment strategy) represents the third level. It lays down the principles of investment as well as the processes for the identification and selection of potential holdings, due diligence and decision making. At the same level, we can find all the other group strategies, such as underwriting or reinsurance.

The internal audit function accompanies all strategies, verifying the proper implementation, application and functioning of procedures.

Each subsidiary will then, according to local corporate law and internal decision-making structures, implement a set of strategies and corresponding procedures as well as controlling, reporting and auditing processes to meet the group guidelines and to ensure a completely integrated risk management system in the group.

According to the Austrian Companies Act, purchasing, selling or closing down participations as well as starting or ending business lines are considered to be extremely important and therefore require the approval of the supervisory board.

To organize their CESEE participations, Austrian groups usually apply two different methods (the method of establishing branches is of minor practical relevance and will therefore not be discussed here): The first method is to

concentrate all participations at the top parent company, the Austrian insurance company. This is practicable when the number of participations is small; it allows directly steering the subsidiaries without additional control mechanisms. However, this method fosters a very personal management style, which may lead to a lack of committee decisions or discussions where many different opinions are offered on the one hand and a reduced management capacity in case the (sole) decision-maker is unavailable on the other hand. The second method is the pooling of participations in a holding company, which typically is a subsidiary of the top parent company. This is practicable for larger groups, but leads to additional administration and control processes. The holding company as a separate legal entity has to make sure that all procedures are in place for proper decision making at all decision levels (e.g. investment committee, executive board, supervisory board). This may concern investment decisions, capital increases or other refinancing techniques and the strategies mentioned above. All decisions must be in line and in time with the corresponding decisions of the parent company.

Very large groups or groups with a very heterogeneous portfolio of participations may implement a third method, where different holding companies are responsible for different parts of the participations. This method requires – according to the principle of proportionality – a more complex risk management system.

All Austrian insurance companies have a group risk management that has the lead responsibility with regard to all risk management matters and the competence of methodology throughout the group. Each subsidiary has in place a risk management function or at

least a risk management coordinator, even if this is not a local legal requirement. The risk managers (and coordinators) are members of the group risk committee, which discusses (and in some cases decides) all risk relevant topics, e.g. risk analysis, regular review of the risk map, risk reports, risk-reducing measures, or the roll-out of new procedures.

Concerning the group asset management, a wide variety of methods and steering procedures is implemented because of the complexity and diversity of local legislation and the different development stages of the markets. Even the core business in the different countries influences asset allocation via the asset liability modelling and liquidity needs. Basically a group asset management and an asset management committee is set up with the central competence of methodology and an accumulating view on assets and their risks and an appropriate limit system.

Regarding the reporting needs, it is necessary to have a central data definition and an adequate reporting system to facilitate the consolidation of all relevant (risk-related) data across the group, the calculation of central risks (e.g. concentration risk) and modelling needs. It is also necessary to bear in mind that there are different systems of valuation in different countries (local GAAP vs. IFRS). The reporting system includes a data transfer and storing/saving mechanism of all relevant data, regardless of their source – general ledger, subsidiary ledgers, statistical and actuarial data and all metadata necessary for correct data accumulation. These reporting standards require an integrated IT system providing for secure data access and transmission. Legislation in some countries requires that IT hardware be physically installed in this country, which raises the costs

and complexity of the system and the ensuing control procedures.

The most complex areas in terms of risk management and centralization are underwriting and reinsurance, which are the core business of insurance companies. Apart from different languages, economic development and local requirements concerning the minimum information to be provided to the customer before signing a contract, the chosen expansion strategy adds to the complexity of these areas. If the strategy is expansion by acquisition, it will be necessary to integrate actuarial tariffs and models and to consider existing contracts, business connections or distribution channels. On the other hand, companies pursuing a strategy of expansion by development cannot use existing structures but have to build them themselves. The same is true for, e.g., IT systems, all procedures concerning claims or anti-fraud-efforts.

Last but not least, in developing and implementing a CESEE strategy it is essential to bear in mind that CESEE is not a homogeneous area but consists of different countries with different geographical and economic conditions and, of course, customers and staff from different cultures and backgrounds, which could create a kind of diversification effect.

## **5 Impact of Solvency II on Business in CESEE**

The new risk-based supervisory regime for the insurance sector, commonly known as Solvency II, is expected to have a direct and indirect impact on the CESEE business of insurance companies.

Direct effects will be observable in the calculation of the solvency capital requirement (SCR).

According to the Solvency II directive, the solvency capital requirement



shall reflect all material risks an insurance undertaking is facing in its business activity. As could be observed in various quantitative field studies carried out in preparation of the new regime, market risk is one of the key drivers of the solvency capital requirement from the Austrian perspective. Insurance undertakings in CESEE mainly follow a rather conservative asset management strategy, which is also due to the fact that the range of investment opportunities is rather limited in most markets (see also section 2.3 of this study). Therefore, a major part of assets is invested in government bonds or cash deposits at local credit institutions. Such an asset allocation may have an impact on the solvency capital requirement due to a higher concentration risk and a lower counterparty risk because of the positive treatment of European government bonds under the standard model of Solvency II.

In applying Solvency II rules, insurance companies may benefit from “old” structures. After entering the EU, European directives had to be transposed into national law that often included the obligation to separate business lines. This means that an insurance company may either provide life insurance or non-life insurance products but not all lines of business together. However, existing insurance companies were allowed to keep their license to provide all kinds of insurance as so called “composite insurers.” Under the new solvency regime, composite insurers can now benefit from this structure as they can make use of diversification effects between the lines of business and therefore reduce the solvency capital requirement at solo level.

In general, the Solvency II rules may lead to a change in the structure and organization of insurance companies and groups; therefore they will have an indirect effect on the CESEE business as well.

The application of Solvency II rules requires well functioning structures and systems at every insurance company: On the one hand, complex calculations have to be carried out that require a sound and comprehensive data basis and special knowledge and skills. On the other hand, it is not only the quantitative but also the qualitative requirements related to the governance system and market transparency that require the well documented implementation of sound reporting, risk management and control systems (also see section 4 of this study).

Especially smaller companies within a group will find it difficult to meet all these requirements in a cost-efficient way. As a consequence, groups may decide to centralize and/or outsource functions, either within or outside the group. Moreover, a parent company may decide to restructure the group and convert subsidiaries into branches.

Solvency II might lead to a stronger centralization within insurance groups with respect to back office systems and governance functions. Even though every insurance company has to have its own governance system and every group has to ensure a group-wide governance system, the Solvency II directive allows an even more centralized approach. Title III subsection 6 of the Solvency II framework directive<sup>16</sup> deals with the possibility of installing centralized risk management within a group. Even though the detailed requirements

<sup>16</sup> Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009 on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II).

of this subsection have not been specified, this provision makes it possible for internationally active insurance groups to benefit from strongly centralized structures. The main advantage of centralized risk management for an insurance group is that it is incompatible with subgroup supervision. In other words, if an insurance group gets the approval from its supervisor to apply centralized risk management, there will be no (potential) subgroup supervision of subsidiaries in the jurisdictions concerned.

From the supervisory authorities' point of view, Solvency II will also bring a new focus to supervision with regard to group supervision. Due to the increasing importance of group supervision, the cross-border cooperation of supervisory authorities will be intensified, e.g. by strengthening the role of the group supervisor and the supervisory colleges. The group supervisor, who, in most cases, is the supervisory authority responsible for the supervision of the ultimate parent company of a group, is responsible for group supervision to be carried out for each group. In doing so, the group supervisor is supported by the supervisory college. A supervisory college is established for each cross-border active insurance group and consists of all the supervisory authorities that are responsible for the supervision of the parent undertaking or any subsidiary of an insurance group. A major aim of the supervisory college is to exchange information and cooperate in the supervision of a group on an ongoing basis in normal times as well as in case of crisis. In the latter case, a functioning supervisory college should also allow quicker and well-coordinated action to counter major events that might threaten the financial stability of a cross-border insurance group.

## 6 Conclusions

CESEE still holds substantial growth potential for the insurance market, even though in some countries of the region non-life insurance penetration is quite close to Western European levels. Competition is increasing and putting pressure in particular on non-life products and on the profitability (margins) of insurance companies as a whole. Recent developments show that premium growth has been influenced strongly by economic developments and the catching-up process. Therefore premium growth tended to be more volatile. The investments of CESEE insurance companies are focused on debt instruments. The domestic financial markets in CESEE are rather underdeveloped and may be the reason for some restrictions in investment strategies. Both the individual insurance markets and the economies of CESEE are at different stages of development, which confirms the heterogeneity of the region.

Austrian insurance groups have entered the market early and are important market players in many countries of the region. Their CESEE activities contribute significantly to their overall profitability. From a macroprudential perspective, the exposure of Austrian banks and insurance companies to CESEE warrants close monitoring, in particular as catching-up has not yet been completed. In the worst case, a crisis of confidence at one Austrian financial institution could spill over to other Austrian banks or insurance companies, even though ownership and financial linkages are generally limited. As the exposure of both, Austrian banks and insurers, to CESEE is sizeable even on a stand-alone basis, this risk is non-negligible. On the positive side, Austrian insurers' CESEE business activities are to a large extent focused

on countries with comparatively more stable macrofinancial conditions.

As regards risk management issues, a central data definition and an adequate reporting system are key to the sound management of risk and to modeling purposes. Challenges may arise from the low harmonization of accounting and valuation standards. The most complex areas in terms of risk management and centralization are underwriting and reinsurance.

In the context of Solvency II, smaller companies will find it most challenging to meet the requirements in an appropriate and cost-efficient way, which may result in centralization and/or the outsourcing of functions within or outside a group, and subsidiaries could be converted into branches. From the supervisory authorities' point of view, Solvency II will also bring a new focus to supervision with regard to group supervision and will increase harmonization.

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## Annex

Table A1

### Panel Regression for Insurance Premium Growth in CESEE

Dependent variable: premium growth

Variable	Coefficient	Std. error	t-stat	Prob
C	0.03	0.01	3.75	0.0003
GDP	1.51	0.14	10.68	0.0000
<b>Fixed effects</b>				
Bulgaria	0.01		Poland	-0.02
Czech Rep.	-0.02		Romania	0.06
Estonia	-0.02		Russia	0.03
Croatia	-0.04		Slovenia	-0.02
Hungary	-0.02		Slovakia	-0.06
Lithuania	0.03		Ukraine	0.14
Latvia	-0.06			
r-squared				0.55
Adjusted r-squared				0.51
F-stat				12.15

Source: Authors' calculations.

Note: Panel regression: pooled EGLS (cross-section weights); cross section included 13; data: 2000–2010; total observations: 143.

# Bank Supervision and Resolution: National and International Challenges

Summary of a Joint Workshop of CEPR, the University of Vienna and the OeNB

On October 3 and 4, 2011, the Center of Economic Policy Research (CEPR), the University of Vienna and the Oesterreichische Nationalbank (OeNB) held a joint research workshop on the topic “Bank Supervision and Resolution: National and International Challenges” at the OeNB in Vienna. In the two days of the workshop twelve papers selected through a call for papers were presented.<sup>2</sup> In his opening address, Peter Mooslechner (OeNB) went through some of the intricacies of resolution policies in an international context.

## Bank Resolution: Facing the Challenges

The workshop took one of its central themes – bank resolution – head on by opening with a policy panel with Thorsten Beck (Tilburg University), Harry Huizinga (Tilburg University), Andreas Ittner (OeNB), Charles Kahn (University of Illinois) and Luc Laeven (IMF). There was a widely shared view among the panelists that resolution regimes are a key element in a multilayered system of financial stability instruments. The key role of resolution regimes comes of the fact that the rules of how institutions that fail will ultimately be dealt with determine very much their ex-ante behavioral incentives. On a practical note, Andreas Ittner pointed out that progress in legislation has to come in the form of special bank resolution frameworks outside the specific insolvency laws, because the heteroge-

neity and complexity of insolvency laws in different countries would make any harmonization attempts a project of decades rather than years.

The first research paper in the program by Max Bruche (CEMFI) provided an analysis of a specific incentive problem supervisors are regularly confronted with: How can banks with a high proportion of bad loans be made to voluntarily foreclose these loans and prevented from concealing their difficulties and gambling for resurrection? In a joint paper with Gerard Lobet (CEMFI), he suggests a mechanism which will provide incentives to voluntarily disclose detailed information on the loan portfolio. The optimal mechanism consists of a two-part tariff, with a fixed payment and a variable subsidy per loan foreclosed. It turns out that this mechanism can be designed such that banks always participate and always foreclose. Furthermore, the informational rents for the banks can be eliminated. In his comment, Ulrich Hege from HEC Paris contrasted the mechanism with an outright nationalization and found some advantages of nationalization over the mechanism. If the public sector can be provided with the right incentives to impose a tough restructuring on nationalized banks and resell the bank to the market afterwards, this sometimes may prove more beneficial than voluntary mechanisms that have the unpleasant feature that something is paid to the bank for revealing that there are problems in the balance sheet.

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<sup>2</sup> Slides of the presentations and more specific references are available on request. Please mail inquiries to Katharina.Spiegl@oenb.at.

### Dealing with Liquidity Issues

Liquidity issues were the central topic during the remainder of the morning of the first workshop day, covered by a paper by Hans Degryse (Tilburg University) and a paper by Cornelia Holthausen (ECB).

In his joint paper with Muhammad Ather Elahi (State Bank of Pakistan) and Maria Fabiana Penas (Tilburg University), Hans Degryse analyzed the issue of regional banking fragility and its impact on cross-border banking contagion. In particular, the authors addressed the question of which banking characteristics in the host region alleviate cross-regional banking contagion. The authors found that regional financial fragility is mitigated by liquidity and capitalization but amplified by concentration. As regards cross-regional contagion, effects stemming from the U.S.A. and Europe affect Asia and Latin America more strongly than contagion between themselves. Finally, the higher bank liquidity and capitalization in a host region, the smaller the impact of contagion from triggering regions.

Cornelia Holthausen presented a joint paper with Jens Eisenschmidt (ECB) on maturity mismatch and liquidity regulation, in which they investigate whether there is a theoretical explanation of why banks with a higher maturity mismatch rely more heavily on central bank liquidity. For the authors this question came up from the experience with the longer-term liquidity measures of the ECB during the recent crisis, where it turned out that especially banks with the need of roll-over funding had a high demand for long-term funds. In their theoretical analysis, the authors find that banks with a high maturity mismatch of assets and liabilities have the highest willingness to pay in long-term central bank auctions (because they aim at reducing

the mismatch). This effect is stronger, the more severe the crisis. The empirical analysis finds that there is a relationship between a measure of maturity mismatch in the banking book and bank risk. Banks under stress display significantly different demand behavior in Eurosystem operations than non-stressed banks.

### Issues in Cross-Border Banking

The afternoon of the first workshop day was dedicated to some current issues arising in cross-border banking, from the globalization of banking supervision to ringfencing up to barriers to cross-border banking resulting from the financial safety net and the interactions between home country regulation standards and bank lending standards abroad.

Thorsten Beck (Tilburg University) started the session by presenting a joint paper with his Tilburg colleagues Radomir Todorov and Wolf Wagner, in which the authors attempt to evaluate the costs and benefits of a global banking supervision framework. Motivated by a bon mot by Charles Goodhart, who famously said that “banks are global in life but national in death,” and the recent experience with the limits to resolution options for cross-border banks, the paper provides a cost-benefit analysis of raising bank supervision institutionally to a global level. Based on a theoretical and empirical analysis, the authors find that a global supervisor would improve on the current situation but only if this supervisor would at the same time be equipped with resolution authority. The main concern of the discussant of this paper, Giacomo Calzolari (University of Bologna), was that the empirical analysis, which is based on a very stylized toy model of bank supervision in a multinational context, is not very clear on the exact

distortions that arise from the national supervision of multinational banks.

Eugenio Cerutti (IMF) gave a paper coauthored with his IMF colleagues Anna Ilyina, Yulia Makarova and Christian Schmieder on the implications of ringfencing for European cross-border banks. While, on the one hand, many cross-border banking groups acted as lenders of last resort for their CESEE subsidiaries during the crisis, many host country regulators, on the other hand, might ringfence foreign affiliates within their jurisdictions due to banking-stability considerations (e.g. the need to protect the domestic banking system from negative spillovers from the rest of the group) or macro-stability considerations (e.g. avoiding capital outflows). Against this background, the authors ask the very practical question about the capital needs of banking groups under different ringfencing assumptions. The authors arrive at the following three, very interesting main findings: First, the capital needs of cross-border banking groups to ensure the adequate capitalization of all parts of the group (after a shock) are higher under complete or partial ringfencing than under no ringfencing. Second these differences are more significant for geographically more diversified banking groups. Finally, standard stress tests of cross-border banking groups based on consolidated balance sheet data (which implicitly assume no restrictions on intra-group transfers) may lead to wrong conclusions about the adequate level of the group's capitalization. The capital needs of cross-border banks due to ring fencing may increase by 150% up to 300% according to the authors' calculations.

Cross-border banking issues remained the central topic in the afternoon sessions. Ata Can Bertay (Tilburg University and World Bank) presented

a joint paper with Asli Demirgüç-Kunt (World Bank) and Harry Huizinga (Tilburg University and CEPR) on financial safety nets and barriers to cross-border banking. The authors find in an empirical study that international banks are at a competitive disadvantage compared to domestic banks due to their limited access to public safety nets. As a consequence, international banks are subject to more market discipline by depositors. This creates interesting policy conflicts: While one might wish to level the playing field for all banks, the paper suggests that this might go hand in hand with a decrease in market discipline by international banks, an effect that is clearly undesirable. The discussant Alberto Pozzolo (Università degli Studi del Molise), while appreciating the results and the paper overall, raised doubts whether the effect studied by the authors is – in principle and in view of the magnitude of the effects suggested by the empirical findings – the most important argument in favor of agreements on the bail-outs of international banks.

The first day ended with a presentation by Steven Ongena (Tilburg University) on the interaction between the home regulatory regime and the behavior of banks abroad. As mentioned by the discussant, Ricardo Hauswald (American University Washington), the problem analyzed in the paper could be translated into a family context by raising the question whether strictly prohibiting certain behaviors of the kids at home will have the only effect that they pursue these forbidden behaviors with even more energy outside the house. In Ongena's paper, co-authored by Alexander Popov (ECB) and Greg Udell (Indiana University), the authors look specifically at the issue of risk taking. Their main findings are that ex-ante riskier firms in host country



localities are dominated by banks facing anti-competitive regulation at home and as a consequence face a higher probability of being constrained in terms of new credit. Ex-ante riskier firms in host country localities are dominated by banks facing higher activity restrictions and capital standards and as a consequence a lower probability of being constrained in terms of new credit. These findings seem to suggest that domestic regulation has cross-border spillovers that should be taken into account in regulatory design.

### **Bank Capital and Macroprudential Regulation**

The second workshop day was mainly devoted to different issues in capital regulation. This topic was also the theme of the keynote speech given by Rafael Repullo (CEMFI). Repullo took up an all-time favorite among the topics discussed in capital regulation: the procyclicality issue. His contribution based on joint work with Javier Suarez (CEMFI) is a more formal analysis compared to most of what has been written on the subject, including the Basel Committee's proposals for procyclicality adjustments. Repullo's model aims to, first, assess the extent to which bank capital regulation can lead to amplification of business cycle fluctuations through its effects on the supply of loans, second, to evaluate the impact of the risk-based capital requirements and, third, to compare different regulations in welfare terms. In a quantitative analysis of the theoretical model using calibrations of key parameters the main findings are that Basel II indeed produces procyclical capital buffers and increases the risk of credit crunches. But it also makes banks safer. A welfare comparison demonstrates that Basel II is better than Basel I and that from the

welfare point of view, there are no clear welfare justifications for cyclical adjustments. As with all calibration exercises, these results have to be seen as coming from a pure thought experiment. There is no independent evidence that the formal framework used in the analysis indeed captures the main mechanisms at work in real banking systems. Thus, only a careful debate of the results and the assumptions from which they are derived can eventually bring them into perspective in the general debate about procyclicality.

The first paper after the keynote lecture was the joint work of José-Luis Peydró (Universitat Pompeu Fabra), Gabriel Jiménez (Banco de España), Steven Ongena (Tilburg University) and Jesús Saurina (Banco de España) investigating the now famous Spanish dynamic provisioning experiment. What can be said about this experiment in the light of macroprudential policy goals and the smoothing of excessive credit cycles? The authors find that countercyclical capital buffers strongly mitigate credit supply cycles. Firms are more affected by decreases in credit supply during crisis times when switching from banks with low to high capital buffers is difficult. These are important policy implications for Basel III, bank bailouts, monetary policy and, in general, for macroprudential policy. Individual bank capital matters in crises. The discussant Laurent Bach (Stockholm School of Economics) remarked that the evidence presented in the paper shows that dynamic provisioning reduces fluctuations in total supply of credit by banks but he did not see direct evidence of reduced overlending and reduced credit rationing. He would have needed more evidence to find the evidence as a whole convincing.

Lev Ratnovski (IMF) presented a joint paper with Enrico Perotti (Univer-



sity of Amsterdam) and Razvan Vlahu (Dutch Central Bank) dealing with capital regulation and tail risk. He presented a theoretical model that suggested that bank capital requirements are inadequate to deal with bank incentives to take on tail risk, which needs a separate focus by supervisors and regulators.

Theo Vermaelen (INSEAD) presented a joint paper with George Penacchi (University of Illinois) and Christian Wolff (University of Luxembourg) on a convertible debt instrument (COERC) that would assume the same function as contingent convertible bonds while avoiding some of their undesirable features. Contingent convertibles (CoCos) are bonds that mandatorily convert to equity after a triggering event. The motivation for requiring such an instrument in the capital structure of banks is to provide discipline of debt in good times and to avoid bailouts in bad times. The instrument functions such that if the value of stock plus COERC hits a lower trigger, then the COERC is converted into a large number of common shares that can be repurchased by the original equity holders at par. This security comes with a number of advantages: It increases equity when the bank does poorly, without forcing the bank to raise external capital; it avoids multiple equilibria which plague standard CoCos; it largely eliminates incentives to manipulate the price toward the trigger; and it reduces risk-shifting incentives. The discussant, Josef Zechner (Vienna University of Economics and Business), pointed out some of the potential problems, most importantly the problem that the mechanism features equity injections by existing or new shareholders in times when the bank is doing poorly. These may be exactly the times when it is hard to raise new equity. Zechner also pointed out that in the

likely event that there is asymmetric information, issuing the instrument might be stigmatized, which in turn might require making the issuance mandatory for all institutions.

### Bank Supervision

Finally the workshop featured two papers dealing with specific supervision issues. Julio Rotemberg (Harvard Business School) presented a model using behavioral economics to discuss the bank run problem. The gist of the paper is that people like demandable deposits because to them they appear safer than they actually are. People are overconfident about how well they will do in a run. In a world with behavior characterized by overconfidence, it makes sense to control bank assets even without deposit insurance and it makes sense to use mandatory clawbacks in bankruptcy. The final paper by Roman Inderst (University of Frankfurt), coauthored by Sebastian Pfeil (University of Frankfurt), addressed issues of bonus-driven compensation, whether it should be regulated and how such regulation interacts with other policies, such as minimum exposure regulation.

### The Bigger Picture

While the papers presented at the workshop were quite heterogeneous in terms of methodology and topics, they also showed quite clearly that with respect to international issues of regulation, there are still remarkable gaps in the way policies are interpreted and in what options are considered desirable. As regards resolution, there seems to be a common understanding that it has to play a key role within the wider framework of financial stability policies. The question of what a good resolution regime would specifically look like remain still very much open.

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# Annex of Tables

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Cutoff date for data: November 18, 2011

Conventions used in the tables:

x = No data can be indicated for technical reasons

.. = Data not available at the reporting date

Revisions of data published in earlier volumes are not indicated.

Discrepancies may arise from rounding.

## International Environment

Table A1

### Exchange Rates

	2007	2008	2009	2010	2008	2009	2010	2011
Year					1 <sup>st</sup> half			
	Period average (per EUR 1)							
U.S. dollar	1.37	1.47	1.39	1.33	1.53	1.33	1.33	1.40
Japanese yen	161.25	152.35	130.27	116.47	160.56	127.27	121.53	115.02
Pound sterling	0.68	0.80	0.89	0.86	0.78	0.89	0.87	0.87
Swiss franc	1.64	1.59	1.51	1.38	1.61	1.51	1.44	1.27
Czech koruna	27.76	24.96	26.45	25.29	25.19	27.15	25.73	24.35
Hungarian forint	251.32	251.70	280.50	275.40	253.66	289.99	271.64	269.42
Polish zloty	3.78	3.52	4.33	3.99	3.49	4.47	4.00	3.95
Slovak koruna <sup>1</sup>	33.78	31.27	x	x	32.22	x	x	x

Source: Thomson Reuters.

<sup>1</sup> From 1 January 2009 (Slovak koruna): irrevocable conversion rate against the euro.

Table A2

### Key Interest Rates

	2007	2008	2009	2010	2011	
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	
	End of period, %					
Euro area	4.00	4.00	2.50	1.00	1.00	
U.S.A.	4.25	2.00	0.25	0.25	0.25	
Japan	0.460	0.570	0.100	0.110	0.094	
United Kingdom	5.50	5.00	2.00	0.50	0.50	
Switzerland <sup>1</sup>	2.25–3.25	2.25–3.25	0.00–1.00	0.00–0.75	0.00–0.75	
Czech Republic	3.50	3.75	2.25	1.50	1.00	
Hungary	7.50	8.50	10.00	9.50	6.25	
Poland	5.00	6.00	5.00	3.50	3.50	
Slovak Republic <sup>2</sup>	4.25	4.25	2.50	x	x	

Source: Eurostat, Thomson Reuters, national sources.

<sup>1</sup> SNB target range for three-month LIBOR.

<sup>2</sup> From 2009 onwards: see euro area.

Table A3

**Short-Term Interest Rates**

	2007	2008	2009	2010	2008	2009	2010	2011
Year					1 <sup>st</sup> half			
<i>Three-month rates, period average, %</i>								
Euro area	4.28	4.63	1.23	0.81	4.67	1.67	0.67	1.26
U.S.A.	5.30	2.92	0.69	0.34	3.01	1.05	0.35	0.28
Japan	0.73	0.85	0.59	0.39	0.85	0.66	0.42	0.34
United Kingdom	5.95	5.49	1.22	0.74	5.79	1.72	0.68	0.82
Switzerland	2.55	2.57	0.37	0.19	2.79	0.45	0.21	0.18
Czech Republic	3.10	4.04	2.19	1.31	4.07	2.52	1.41	1.21
Hungary	7.75	8.87	8.64	5.51	8.18	9.64	5.61	6.07
Poland	4.74	6.36	4.42	3.92	6.12	4.63	3.99	4.26
Slovak Republic <sup>1</sup>	4.34	4.15	x	x	4.31	x	x	x

Source: Bloomberg, Eurostat, Thomson Reuters.

<sup>1</sup> From 2009 onwards: see euro area.

Table A4

**Long-Term Interest Rates**

	2007	2008	2009	2010	2008	2009	2010	2011
Year					1 <sup>st</sup> half			
<i>Ten-year rates, period average, %</i>								
Euro area	4.31	4.24	3.71	3.34	4.26	3.79	3.45	5.36
U.S.A.	4.80	4.22	4.07	4.25	4.47	3.81	4.49	4.45
Japan	1.67	1.49	1.34	1.17	1.50	1.36	1.30	1.21
United Kingdom	5.00	4.49	3.66	3.58	4.78	3.54	3.87	3.58
Switzerland	2.93	2.90	2.20	1.63	3.14	2.30	1.81	1.89
Czech Republic	4.30	4.63	4.84	3.88	4.74	4.98	4.14	3.97
Hungary	6.74	8.24	9.12	7.28	7.95	10.31	7.29	7.29
Poland	5.48	6.07	6.12	5.78	6.02	6.08	5.85	6.15
Slovak Republic	4.49	4.72	4.71	3.87	4.52	4.87	3.95	4.30
Slovenia	4.53	4.61	4.38	3.83	4.51	4.75	3.90	4.40

Source: Eurostat, national sources.

Table A5

**Corporate Bond Spreads**

	2007	2008	2009	2010	2008	2009	2010	2011
Year					1 <sup>st</sup> half			
<i>Period average, percentage points</i>								
Spreads of 7- to 10-year Euro area corporate bonds against euro area government bonds of same maturity								
AAA	0.27	0.70	0.69	-0.07	0.53	0.97	0.01	-0.25
BBB	1.26	3.55	4.65	2.06	2.58	6.31	2.06	1.62
Spreads of 7- to 10-year U.S. corporate bonds against U.S. government bonds of same maturity								
AAA	0.65	2.09	1.64	0.70	1.53	2.50	0.70	0.74
BBB	1.50	4.16	4.51	2.21	3.10	6.05	2.18	1.91

Source: Merrill Lynch via Thomson Reuters.

Table A6

**Stock Indices<sup>1</sup>**

	2007	2008	2009	2010	2008	2009	2010	2011
Year					1 <sup>st</sup> half			
Period average								
Euro area: EURO STOXX	416	314	234	266	359	210	265	283
U.S.A.: S&P 500	1,477	1,221	948	1,140	1,362	851	1,129	1,311
Japan: Nikkei 225	16,984	13,592	9,348	10,022	13,595	8,627	10,450	9,951
Austria: ATX	4,619	3,358	2,131	2,557	4,030	1,804	2,529	2,837
Czech Republic: PX50	1,776	1,359	962	1,171	1,580	818	1,183	1,241
Hungary: BUX	26,086	19,744	16,043	22,480	22,760	12,692	22,531	22,990
Poland: WIG	58,988	40,681	32,004	42,741	47,246	26,771	40,894	48,467
Slovak Republic: SAX16	422	431	318	226	450	338	230	235
Slovenia: SBI TOP	2,160	1,683	975	891	2,020	917	948	803

Source: Thomson Reuters.

<sup>1</sup> EURO STOXX: December 31, 1991 = 100, S&P 500: November 21, 1996 = 100, Nikkei 225: April 3, 1950 = 100, ATX: January 2, 1991 = 1,000, PX50: April 6, 1994 = 1,000, BUX: January 2, 1991 = 1,000, WIG: April 16, 1991 = 1,000, SAX16: September 14, 1993 = 100, SBI TOP: March 31, 2006 = 1,000.

Table A7

**Gross Domestic Product**

	2007	2008	2009	2010	2008	2009	2010	2011
Year					1 <sup>st</sup> half			
Annual change in %, period average								
Euro area	2.8	0.4	-4.2	1.7	1.6	-5.2	1.5	2.0
U.S.A.	1.9	0.0	-2.6	2.9	1.3	-4.8	2.8	1.9
Japan	2.4	-1.2	-6.3	4.0	0.6	-8.5	4.4	-0.9
Austria	3.7	2.2	-3.9	2.0	2.7	-5.3	1.6	3.9
Czech Republic	6.1	2.5	-4.1	2.3	3.3	-4.3	2.1	2.6
Hungary	0.8	0.8	-6.7	1.2	2.2	-7.5	0.5	1.9
Poland	6.8	5.1	1.6	3.8	6.3	0.8	3.1	4.2
Slovak Republic	10.5	5.8	-4.8	4.0	8.1	-5.3	4.4	3.4
Slovenia	6.9	3.6	-8.0	1.4	5.8	-8.9	0.7	1.6

Source: Eurostat, national sources.

Table A8

**Current Account**

	2007	2008	2009	2010	2008	2009	2010	2011
Year					1 <sup>st</sup> half			
	<i>% of GDP, cumulative</i>							
Euro area	0.2	-0.8	-0.6	-0.4	-1.7		-0.8	-1.1
U.S.A.	-5.1	-4.7	-2.7	-3.3	-4.8	-2.6	-3.2	-3.6
Japan	4.8	3.3	2.8	3.5	4.1	2.5	3.6	..
Austria	4.0	3.7	2.6	3.2	5.7	3.2	3.4	3.1
Czech Republic	-4.5	-2.2	-2.5	-3.2	-1.2	-2.3	-0.8	-1.6
Hungary	-7.2	-7.3	-0.2	1.1	-6.1	-1.3	1.3	2.3
Poland	-4.7	-4.8	-2.2	-4.7	-5.1	-1.6	-3.0	-3.6
Slovak Republic	-5.4	-6.1	-3.6	-3.5	-6.4	-3.2	-2.0	-0.5
Slovenia	-4.8	-6.7	-1.5	-1.2	-5.6	-1.4	-1.1	0.1

Source: Eurostat, European Commission, Thomson Reuters, 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**

	2007	2008	2009	2010	2008	2009	2010	2011
Year					1 <sup>st</sup> half			
	<i>Annual change in %, period average</i>							
Euro area	2.1	3.3	0.3	1.6	3.5	0.6	1.4	2.6
U.S.A.	2.8	3.8	-0.4	1.6	4.2	-0.6	2.1	2.8
Japan	0.0	1.4	-1.4	-0.7	1.2	-0.6	-1.1	-0.5
Austria	2.2	3.2	0.4	1.7	3.5	0.6	1.5	3.3
Czech Republic	3.0	6.3	0.6	1.2	7.1	1.2	0.7	1.9
Hungary	7.9	6.0	4.0	4.7	6.8	3.1	5.5	4.1
Poland	2.6	4.2	4.0	2.7	4.4	3.9	2.9	3.8
Slovak Republic	1.9	3.9	0.9	0.7	3.7	1.7	0.3	3.8
Slovenia	3.8	5.5	0.9	2.1	6.4	1.1	2.1	2.1

Source: Eurostat.



## The Real Economy in Austria

Table A10

### Financial Investment of Households<sup>1</sup>

	2007	2008	2009	2010	2008	2009	2010	2011
Year					1 <sup>st</sup> half			
Transactions, EUR million								
Currency and deposits <sup>2</sup>	13,632	13,711	9,069	2,734	7,998	7,203	1,960	3,127
Securities (other than shares) <sup>3</sup>	3,808	5,400	-237	915	2,568	-369	188	1,513
Shares (other than mutual fund shares)	300	1,340	1,018	1,280	788	932	459	-25
Mutual fund shares	-341	-4,670	948	2,901	-1,692	-272	858	-676
Insurance technical reserves	3,837	2,865	4,481	4,264	1,872	2,701	2,615	1,905
Total financial investment	21,236	18,646	15,279	12,094	11,534	10,195	6,080	5,844

Source: OeNB.

<sup>1</sup> Including nonprofit institutions serving households.<sup>2</sup> Including loans and other assets.<sup>3</sup> Including financial derivatives.

Table A11

### Household<sup>1</sup> Income, Savings and Credit Demand

	2007	2008	2009	2010
Year				
Year-end, EUR billion				
Net disposable income	163.6	168.4	166.5	169.4
Savings	19.2	19.5	18.0	14.2
Saving ratio in % <sup>2</sup>	11.7	11.5	10.8	8.4
MFI loans to households	126.0	132.3	132.6	139.7

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

<sup>1</sup> Including nonprofit institutions serving households.<sup>2</sup> Saving ratio = savings / (disposable income + increase in accrued occupational pension benefits).

Table A12

### Financing of Nonfinancial Corporations

	2007	2008	2009	2010	2008	2009	2010	2011
Year					1 <sup>st</sup> half			
Transactions, EUR million								
Securities (other than shares)	4,595	2,954	5,939	3,851	584	3,231	2,130	2,399
Loans	32,072	12,690	-11,930	13,307	8,173	-7,768	4,088	1,336
Shares and other equity <sup>1</sup>	38,554	4,674	3,788	-24,145	2,913	290	1,351	3,009
Other accounts payable	3,218	-5,075	-4,046	6,002	-1,859	-1,818	2,977	711
Total debt	78,439	15,244	-6,248	-985	9,812	-6,065	10,546	7,455

Source: OeNB.

<sup>1</sup> Including other equity of domestic special purpose entities held by nonresidents.

Table A13

**Insolvency Indicators**

	2007	2008	2009	2010	2008	2009	2010	2011
Year					1 <sup>st</sup> half			
	<i>EUR million</i>							
Default liabilities	2,441	2,969	4,035	4,700	1,110	1,978	1,587	1,157
	<i>Number</i>							
Defaults	3,023	3,270	3,741	3,522	1,619	1,904	1,724	1,657

Source: Kreditschutzverband von 1870.

Table A14

**Selected Financial Statement Ratios of the Manufacturing Sector**

	2007	2008	2009
	<i>Median, %</i>		
<b>Self-financing and investment ratios</b>			
Cash flow, as a percentage of turnover	8.61	7.77	7.09
Investment ratio <sup>1</sup>	1.78	1.84	1.76
Reinvestment ratio <sup>2</sup>	57.14	65.33	58.33
<b>Financial structure ratios</b>			
Equity ratio	18.57	20.25	23.94
Risk-weighted capital ratio	23.73	25.36	29.95
Bank liability ratio	36.06	34.27	31.80
Government debt ratio	8.81	8.01	7.24

Source: OeNB.

<sup>1</sup> Investments x 100 / net turnover.

<sup>2</sup> Investments x 100 / credit write-offs.

## Financial Intermediaries in Austria<sup>1</sup>

Table A15

### Total Assets and Off-Balance-Sheet Operations

	2007		2008		2009		2010		2011	
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
<i>End of period, EUR million</i>										
Total assets on an unconsolidated basis	900	972	1,069	1,058	1,029	1,027	979	993		
of which: total domestic assets	549	582	693	693	691	675	660	663		
total foreign assets	351	390	377	365	338	352	319	330		
Interest rate contracts	1,690	1,513	1,723	1,755	1,836	2,067	1,397	1,505		
Foreign exchange derivatives	347	394	507	454	419	492	273	261		
Other derivatives	19	22	28	30	25	27	17	20		
Derivatives total	2,056	1,929	2,257	2,239	2,281	2,587	1,687	1,786		
Total assets on a consolidated basis	1,073	1,162	1,176	1,159	1,140	1,193	1,131	1,137		

Source: OeNB.

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

Table A16

### Profitability on an Unconsolidated Basis

	2008	2009	2010	2011	2007	2008	2009	2010
	1 <sup>st</sup> half				Year			
<i>End of period, EUR million</i>								
Net interest income	3,978	4,396	4,584	4,676	7,399	8,248	8,777	9,123
Income from securities and participating interests	1,470	1,492	1,575	2,038	3,521	7,193	3,327	4,026
Net fee-based income	2,157	1,810	1,970	1,964	4,710	4,218	3,603	3,950
Net profit/loss on financial operations	-55	338	454	366	290	-812	486	664
Other operating income	826	737	766	848	1,592	1,710	1,653	1,942
Operating income	8,376	8,773	9,348	9,892	17,512	20,557	17,846	19,706
Staff costs	2,870	2,870	2,839	2,963	5,468	5,776	5,697	5,802
Other administrative expenses	1,880	1,839	1,888	1,962	3,703	3,952	3,765	3,940
Other operating expenses	757	734	807	764	1,678	1,688	1,056	1,252
Total operating expenses	5,507	5,443	5,534	5,689	10,849	11,416	11,077	11,547
Operating profit/loss	2,869	3,331	3,813	4,203	6,663	9,141	6,769	8,159
Net risk provisions from credit business	1,867	3,043	3,404	2,199	2,012	4,201	4,422	2,802
Net risk provisions from securities business	-180	421	-43	169	-430	2,801	4,090	520
Annual surplus <sup>1</sup>	3,765	2,536	2,974	3,876	4,787	1,891	43	4,231
Return on assets <sup>1,2</sup>	0.4	0.2	0.3	0.4	0.6	0.2	0.0	0.4
Return on equity (tier 1 capital) <sup>1,2</sup>	6.4	3.7	4.1	5.2	9.6	3.0	0.1	5.8
Interest income to gross income (%)	47	50	49	47	42	40	49	46
Operating expenses to gross income (%)	66	62	59	58	62	56	62	59

Source: OeNB.

<sup>1</sup> The first-half data are the whole-year values forecast at the end of the second quarter.<sup>2</sup> Retrospective modification due to a change of calculation.

<sup>1</sup> Since 2007, the International Monetary Fund (IMF) has published Financial Soundness Indicators (FSI) for Austria (see also [www.imf.org](http://www.imf.org)). In contrast to some FSIs which take only domestically owned banks into account, the Financial Stability Report analyzes all banks operating in Austria. For this reason, some of the figures presented here might deviate from the figures published by the IMF.

Table A17

### Profitability on a Consolidated Basis

	2008	2009	2010	2011	2007	2008	2009	2010
	1 <sup>st</sup> half				Year			
	End of period, EUR million							
Operating income	16,811	19,215	18,497	18,749	28,118	33,642	37,850	37,508
Operating expenses <sup>1</sup>	8,054	7,794	7,944	8,249	17,041	16,530	15,502	16,204
Operating profit/loss	5,617	8,450	6,612	6,529	11,072	7,855	15,620	13,478
Net profit after taxes	3,265	2,301	1,789	2,897	6,829	586	1,530	4,577
Return on assets <sup>2,5</sup>	0.69	0.47	0.36	0.59	0.79	0.10	0.18	0.46
Return on equity (tier 1 capital) <sup>2,5</sup>	15.2	9.7	6.3	9.8	18.2	2.1	3.6	8.2
Interest income to gross income (%) <sup>3</sup>	63	57	64	65	64	69	59	64
Operating expenses to gross income (%) <sup>4</sup>	61	51	58	58	61	72	53	58

Source: OeNB.

<sup>1</sup> As from 2008 on, operating expenses refer to staff costs and other administrative expenses only.

<sup>2</sup> End-of-period result expected for the full year before minority interests as a percentage of average total assets and average tier 1 capital, respectively.

<sup>3</sup> All figures represent the ratio of net interest income to total operating income less other operating expenses.

<sup>4</sup> All figures represent the ratio of total operating expenses less other operating expenses to total operating income less other operating expenses.

<sup>5</sup> Retrospective modification due to a change of calculation.

Note: Due to changes in reporting, the comparability of consolidated values as from 2008 with earlier values is limited.

Table A18

### Sectoral Distribution of Loans

	2007		2008		2009		2010		2011	
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	End of period, EUR billion									
Nonfinancial corporations	121,992	127,711	133,608	131,971	130,206	131,744	133,302	134,176		
of which: foreign currency-denominated loans	9,884	10,667	12,134	11,263	11,106	12,150	12,197	12,080		
Households <sup>1</sup>	117,601	119,778	124,221	122,378	128,224	128,221	131,288	133,370		
of which: foreign currency-denominated loans	32,279	34,758	38,182	36,271	36,127	38,317	39,041	39,228		
General government	26,303	26,795	25,073	25,994	26,116	27,324	27,174	27,930		
of which: foreign currency-denominated loans	1,603	1,736	1,652	1,709	1,742	2,797	2,761	3,156		
Other financial intermediaries	21,646	22,032	25,770	25,251	24,516	24,454	22,827	22,056		
of which: foreign currency-denominated loans	2,930	3,079	3,529	3,381	3,348	3,736	3,487	3,316		
Foreign nonbanks	103,983	113,057	125,694	121,922	117,726	120,890	117,412	119,822		
of which: foreign currency-denominated loans	38,027	39,182	42,600	38,319	36,100	40,274	38,286	38,656		
Nonbanks total	391,524	409,372	434,366	427,515	426,788	432,633	432,003	437,354		
of which: foreign currency-denominated loans	84,723	89,421	98,096	90,942	88,423	97,274	95,772	96,436		
Banks	263,344	313,897	363,123	353,198	333,865	334,777	281,989	280,490		
of which: foreign currency-denominated loans	69,652	84,560	108,405	96,271	83,728	76,629	64,293	66,960		

Source: OeNB.

<sup>1</sup> Sector "Households" consists here of the sectors "Households" and "Nonprofit institutions serving households".

Note: Figures are based on supervisory statistics and therefore differ from monetary figures used in the text.

Table A19

**Foreign Currency-Denominated Claims on Domestic Non-MFIs**

	2007		2008		2009		2010		2011	
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	<i>End of period, % of total foreign currency-denominated claims on domestic non-MFIs<sup>1</sup></i>									
Swiss franc	88.7	88.8	86.4	86.4	86.3	85.5	86.6	87.2		
Japanese yen	3.6	3.3	5.5	5.4	5.4	5.9	5.8	5.4		
U.S. dollar	5.1	6.1	7.0	6.7	6.7	7.2	6.1	5.9		
Other foreign currencies	2.6	1.8	1.1	1.5	1.6	1.4	1.5	1.5		

Source: OeNB, ECB.

<sup>1</sup> The indicated figures refer to claims of monetary financial institutions (MFIs, ESA definition) on domestic non-MFIs. Given the differences in the definition of credit institutions according to the Austrian Banking Act and of MFIs according to ESA and differences in the number of borrowers, comparability to "Claims on Domestic Nonbanks" is limited. Due to rounding, figures do not add up to 100% for every year.

Table A20

**Loan Quality**

	2007		2008		2009		2010		2011	
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	<i>End of period, % of claims</i>									
Specific loan loss provisions for loans to nonbanks (unconsolidated)	2.4	2.3	2.2	2.5	2.8	3.1	3.2	3.2		
Specific loan loss provisions for loans to nonbanks (consolidated) <sup>1</sup>	2.4	2.4	2.4	2.9	3.5	3.9	4.1	4.3		
Nonperforming loans (unconsolidated)	1.7	x	2.0	x	2.8	x	3.9	x		
	<i>End of period, % of tier 1 capital</i>									
Nonperforming loans (unconsolidated)	25.5	x	31.5	x	39.7	x	51.2	x		

Source: OeNB.

<sup>1</sup> Estimate.

Table A21

**Market Risk<sup>1</sup>**

	2007		2008		2009		2010		2011
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	June 30
<i>End of period, EUR million</i>									
<b>Interest rate risk</b>									
Basel ratio for interest rate risk, % <sup>2</sup>	4.5	4.5	3.9	3.7	3.7	3.9	3.9	3.6	
Capital requirement for the position risk of interest rate instruments in the trading book	1,082.6	857.0	953.3	911.3	780.9	839.8	621.8	647.6	
<b>Exchange rate risk</b>									
Capital requirement for open foreign exchange positions	74.1	99.7	110.3	89.1	75.2	83.1	81.9	83.5	
<b>Equity price risk</b>									
Capital requirement for the position risk of equities in the trading book	180.6	204.7	186.9	166.3	176.9	183.0	198.0	219.5	

Source: OeNB.

<sup>1</sup> Based on unconsolidated data. 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. As long as reporting is according to Basel II mutual funds and nonlinear option risks are included in the data according to their risk categories.

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

Table A22

**Liquidity Risk**

	2007		2008		2009		2010		2010
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	June 30
<i>End of period, %</i>									
Short-term loans to short-term liabilities	64.0	69.8	67.0	74.2	72.5	71.2	64.2	69.0	
Short-term loans and other liquid assets to short-term liabilities	109.9	112.7	109.0	125.0	124.8	122.9	118.9	122.9	
Liquid resources of the first degree: 5% quantile of the ratio between available and required liquidity of degree 1 <sup>1</sup>	140.0	140.2	149.4	143.3	139.9	146.5	145.1	150.0	
Liquid resources of the second degree: 5% quantile of the ratio between available and required liquidity of degree 1 <sup>1</sup>	110.2	113.1	113.5	116.8	110.8	112.4	111.3	114.1	

Source: OeNB.

<sup>1</sup> Short-term loans and short-term liabilities (up to 3 months against banks and non-banks). Liquid assets (quoted stocks and bonds, government bonds and eligible collateral, cash and liquidity reserves at apex institutions). 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 (quick ratio). The 5% quantile indicates the ratio between available and required liquidity surpassed by 95% of banks on the respective reporting date.

Table A23

**Solvency**

	2007		2008		2009		2010		2011	
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
<i>End of period, eligible capital and tier 1 capital, respectively, as a percentage of risk-weighted assets</i>										
Consolidated capital adequacy ratio	11.6	11.0	11.0	12.1	12.8	13.3	13.2	13.5		
Consolidated tier 1 capital ratio	8.1	7.7	7.7	8.7	9.3	9.8	10.0	10.3		

Source: OeNB.

Note: Owing to the transition to Basel II, the method of calculation of the capital ratio and the tier 1 capital ratio used from the Financial Stability Report 16 (December 2008) on differs from the method used previously. The denominator of both ratios is given by the sum of all regulatory capital requirements multiplied by the factor 12.5. The numerator of the capital ratio is given by tier 1 and tier 2 capital less deduction items (eligible own funds) plus the part of tier 3 capital not exceeding the capital requirement for position risk. The numerator of the tier 1 capital ratio is given by tier 1 capital less deduction items (eligible tier 1 capital). The sum of all capital requirements consists of the capital requirements for credit risk, position risk, settlement risk, operational risk and the transition to Basel II as well as the other capital requirements.

Table A24

**Exposure to CESEE**

	2007		2008		2009		2010		2011	
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
<i>End of period, EUR billion</i>										
Total assets of subsidiaries <sup>1</sup>	231,742	261,400	267,484	256,842	254,356	264,517	263,810	268,590		
of which: NMS-2004 <sup>2</sup>	115,377	132,770	131,809	127,693	126,916	130,700	130,530	133,284		
NMS-2007 <sup>3</sup>	36,776	39,855	40,679	41,044	40,488	39,776	41,275	41,635		
SEE <sup>4</sup>	43,876	45,559	46,745	47,292	48,676	49,324	49,122	50,573		
CIS <sup>5</sup>	35,713	43,216	48,251	40,813	38,285	44,717	42,883	43,098		
Exposure according to BIS in total <sup>6</sup>	190,775	191,672	199,493	186,232	204,228	212,499	209,665	224,879		
of which: NMS-2004 <sup>2</sup>	96,249	105,536	111,065	103,289	112,538	117,042	116,221	129,028		
NMS-2007 <sup>3</sup>	32,608	33,427	34,034	33,704	33,694	33,337	33,917	34,979		
SEE <sup>4</sup>	38,520	27,301	27,928	27,300	40,409	40,901	39,296	41,514		
CIS <sup>5</sup>	23,398	25,408	26,466	21,939	17,586	21,219	20,231	19,359		
Total indirect lending to nonbanks <sup>7</sup>	x	171,337	175,724	172,256	169,178	176,481	180,416	183,110		
of which: NMS-2004 <sup>2</sup>	x	83,028	82,466	82,787	81,821	83,186	85,580	86,705		
NMS-2007 <sup>3</sup>	x	25,854	26,887	26,547	27,046	27,361	28,244	28,681		
SEE <sup>4</sup>	x	29,004	31,192	32,344	32,021	33,458	34,300	35,936		
GUS <sup>5</sup>	x	33,451	35,179	30,578	28,290	32,476	32,293	31,787		
Total direct lending <sup>8</sup>	x	44,372	49,724	50,947	50,665	50,497	49,431	50,426		
of which: NMS-2004 <sup>2</sup>	x	20,605	21,646	22,085	21,902	22,162	22,419	23,207		
NMS-2007 <sup>3</sup>	x	7,390	9,103	9,337	9,546	8,982	8,484	8,011		
SEE <sup>4</sup>	x	13,134	14,592	15,340	15,022	14,840	14,348	15,063		
GUS <sup>5</sup>	x	3,242	4,383	4,185	4,195	4,513	4,180	4,145		

Source: OeNB.

<sup>1</sup> Excluding Yapi ve Kredi Bankasi (not fully consolidated by parent bank UniCredit Bank Austria).

<sup>2</sup> "NMS-2004": Estonia (EE), Latvia (LV), Lithuania (LT), Poland (PL), Slovakia (SK), Slovenia (SI), Czech Republic (CZ), Hungary (HU).

<sup>3</sup> "NMS-2007": Bulgaria (BG) and Romania (RO).

<sup>4</sup> Southeastern Europe (SEE): Albania (AL), Bosnia and Herzegovina (BA), Croatia (HR), Kosovo (KO), Montenegro (ME), Macedonia (MK), Serbia (RS), Turkey (TR).

<sup>5</sup> Commonwealth of Independent States (CIS): Armenia (AM), Azerbaijan (AZ), Kazakhstan (KZ), Kyrgyzstan (KG), Moldova (MD), Russia (RU), Tajikistan (TJ), Turkmenistan (TM), Ukraine (UA), Uzbekistan (UZ), Belarus (BY), including Georgia (GE).

<sup>6</sup> Exposure according to BIS includes only domestically controlled banks. As Hypo Alpe Adria was included in the fourth quarter of 2009, comparability with earlier values is limited.

<sup>7</sup> Lending (gross lending including risk provisions) to nonbanks by 69 fully consolidated subsidiaries in CESEE according to VERA.

<sup>8</sup> Direct lending to CESEE according to monetary statistics.

Note: Due to changes in reporting, the comparability of values as from 2008 with earlier values is limited.



Table A25

**Profitability of Austrian Subsidiaries<sup>1</sup> in CESEE**

	2008	2009	2010	2011	2007	2008	2009	2010
	1 <sup>st</sup> half				Year			
<i>End of period, EUR million</i>								
Operating income	6,515	6,638	6,585	6,934	10,178	14,102	13,396	13,436
of which: net interest income	4,301	4,253	4,584	4,728	6,748	9,231	8,693	9,333
Securities and investment earnings	58	40	34	57	x	103	50	47
Fee and commission income	1,658	1,406	1,437	1,518	2,847	3,432	2,916	2,954
Trading income	40	785	-42	371	x	46	1,238	368
Other income	458	153	572	260	583	1,291	499	735
Operating expenses	3,353	3,122	3,177	3,400	5,495	6,961	6,267	6,678
of which: personnel expenses	1,551	1,401	1,400	1,480	x	3,200	2,739	2,870
Other expenses	1,802	1,720	1,778	1,920	x	3,761	3,529	3,809
Operating profit/loss	3,161	3,516	3,408	3,535	4,683	7,141	7,129	6,757
Allocation to provisions and impairments	636	2,024	1,983	1,592	x	2,277	4,829	4,094
Result after tax	2,065	1,190	1,117	1,578	3,104	4,219	1,775	2,073
Return on assets <sup>2</sup>	1.7%	0.9%	0.9%	1.2%	1.6%	1.8%	0.7%	0.8%
Provisions <sup>3</sup>	3.7%	3.9%	6.2%	6.8%	2.6%	2.9%	5.3%	6.5%

Source: OeNB.

<sup>1</sup> Excluding Yapi ve Kredi Bankasi (not fully consolidated by parent bank UniCredit Bank Austria).<sup>2</sup> End-of-period result expected for the full year after tax as a percentage of average total assets.<sup>3</sup> Provisions on loans and receivables in proportion of gross loans to customers.

Note: Due to changes in reporting, the comparability of values as from 2008 with earlier values is limited. Furthermore some positions are only available in detail since 2008.

Table A26

**Market Indicators of Selected Austrian Financial Instruments**

	2008		2009		2010		2011	
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Nov. 18
<b>Share prices in % of mid-2005 prices</b>								
Erste Group Bank	116.4	91.2	38.9	49.4	66.4	66.0	91.8	33.3
Raiffeisen Bank International	198.6	148.2	37.0	48.5	75.7	56.9	82.5	31.2
EUROSTOXX – Banken	130.2	87.2	47.2	56.6	70.3	52.7	52.4	30.6
Uniq	129.3	108.7	111.8	85.1	80.3	85.4	90.2	64.1
Vienna Insurance Group	123.7	90.7	54.2	70.9	81.0	75.2	88.6	61.0
EUROSTOXX – Insurance	130.8	96.6	68.9	62.5	75.0	63.8	71.0	55.4
<b>Relative valuation: price-book value ratio</b>								
Erste Group Bank	1.74	1.36	0.50	0.63	0.80	0.79	1.10	0.40
Raiffeisen Bank International	2.84	2.12	0.55	0.72	1.12	0.84	1.22	0.50
EUROSTOXX – Banks	1.75	1.10	0.57	0.74	0.94	0.66	0.64	0.40
Uniq	2.18	1.83	1.94	1.48	1.39	1.48	1.58	1.10
Vienna Insurance Group	1.79	1.31	0.71	0.93	1.03	0.95	1.12	0.80
EUROSTOXX – Insurance	1.68	1.23	0.84	0.84	1.03	0.87	0.94	0.80

Source: Thomson Financial.

Table A27

**Key Indicators of Austrian Insurance Companies<sup>1</sup>**

	2009		2010		2011	% change June 2010 (y-o-y)
	June	Dec.	June	Dec.	June	
<i>End of period, EUR million</i>						
<b>Business and profitability</b>						
Premiums	8,362	16,381	8,510	16,655	8,357	-1.8
Expenses for claims and insurers benefit	5,869	12,348	5,757	11,882	6,162	7.0
Underwriting results	96	132	241	524	379	57.3
Profit from investments	1,245	2,729	1,589	3,203	1,930	21.5
Profit from ordinary activities	349	744	552	1,101	1,028	86.2
Total assets	96,836	99,227	102,625	105,099	106,989	4.3
<b>Investments</b>						
Total Investments	90,120	92,260	95,541	98,300	100,094	4.8
of which: debt securities	36,376	36,397	37,062	38,223	38,332	3.4
stocks and other equity securities <sup>2</sup>	12,728	12,811	12,621	12,559	12,988	2.9
real estate	5,188	5,246	5,193	5,703	5,120	-1.4
Investments for unit-linked and index-linked life insurance	10513	12,822	14,477	15,325	15,659	8.0
Exposure versus domestic banks	16,164	17,168	16,442	15,860	16,297	-0.9
Custody account claims on deposits on reinsurers	1,250	1,218	1,229	1,229	1,736	41.3
<b>Risk Capacity (Solvency Ratio), %</b>	x	336.3	x	343.8	x	x

Source: FMA, OeNB.

<sup>1</sup> Semiannual data exclusive of reinsurance transactions, based on quarterly returns.<sup>2</sup> Contains shares, share certificates (listed and not listed) and all equity instruments held by investment funds.

Table A28

**Assets Held by Austrian Mutual Funds**

	2007	2008		2009		2010		2010
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
<i>End of period, EUR million</i>								
Domestic securities	58,920	54,428	48,777	49,104	48,765	50,589	50,999	51,163
of which: debt securities	14,938	13,774	14,601	16,324	16,013	16,603	15,884	15,572
stocks and other equity securities	3,812	3,527	1,473	2,144	2,863	2,813	3,696	3,630
Foreign securities	106,726	94,487	78,655	80,067	89,845	93,102	96,684	93,897
of which: debt securities	66,473	61,809	57,598	57,548	61,961	63,259	61,744	60,474
stocks and other equity securities	23,723	16,598	8,899	10,064	12,663	12,870	15,540	14,918
Net asset value	165,646	148,915	127,432	129,171	138,610	143,690	147,683	145,060
of which: retail funds	117,864	103,885	82,804	80,383	85,537	88,228	88,314	84,132
institutional funds	47,782	45,030	44,628	48,788	53,073	55,462	59,368	60,928
Consolidated net asset value	137,092	124,129	105,620	107,076	115,337	120,527	123,792	122,398
changed by: redemptions and sales <sup>1,2</sup>	-4,272	-5,060	-7,040	-768	2,399	2,137	1,012	351
Distributed earnings <sup>1</sup>	2,499	1,070	1,965	930	1,767	705	1,697	725
Revaluation adjustments and income <sup>1</sup>	-687	-6,832	-9,505	3,153	7,629	3,759	3,952	-1,020

Source: OeNB.

<sup>1</sup> The figures concerning the change in the consolidated net asset value are semi-annual figures.<sup>2</sup> Change in the consolidated net asset value of Austrian mutual funds by redemptions and sales (net balance of shares in mutual funds issued and bought back).

Table A29

### Structure and Profitability of Austrian Fund Management Companies

	2007		2008		2009		2010		2011
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	June 30
<i>End of period, EUR million</i>									
Total assets	544	453	504	546	642	639	699	635	635
Operating profit <sup>1</sup>	62	80	9	45	60	64	78	77	77
Net commissions and fees earned <sup>1</sup>	155	169	100	124	134	149	154	83	83
Administrative expenses <sup>1,2</sup>	103	96	100	88	97	96	103	96	96
Number of fund management companies	28	29	29	29	30	30	30	30	30
Number of reported funds	2,329	2,330	2,308	2,270	2,182	2,192	2,203	2,205	2,205

Source: OeNB.

<sup>1</sup> All figures are semi-annual figures.

<sup>2</sup> Administrative expenses are calculated as the sum of personnel and material expenses.

Table A30

### Assets Held by Austrian Pension Funds

	2007		2008		2009		2010		2010
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	June 30
<i>End of period, EUR million</i>									
Domestic securities	10,773	10,650	9,705	10,415	11,721	12,482	13,017	13,077	13,077
of which: federal treasury bills and notes	0	0	0	0	0	0	0	0	0
debt securities	137	124	142	163	169	163	173	173	173
mutual fund shares	10,603	10,499	9,543	10,228	11,520	12,296	12,818	12,878	12,878
other securities	33	27	20	24	32	23	26	26	26
Foreign securities	1,473	1,085	972	1,093	1,124	1,117	1,249	1,270	1,270
of which: debt securities	140	96	111	182	138	148	181	159	159
mutual fund shares	1,321	980	851	879	932	944	1,037	1,084	1,084
other securities	12	16	10	32	54	25	31	27	27
Deposits	282	449	790	664	539	318	422	294	294
Loans	158	157	154	185	182	153	137	137	137
Other assets	238	262	332	264	170	176	152	158	158
Total assets	12,924	12,592	11,936	12,621	13,734	14,245	14,976	14,936	14,936
of which: foreign currency	620	462	312	373	448	424	466	428	428

Source: OeNB.

Table A31

**Assets Held by Austrian Severance Funds**

	2007		2008		2009		2010	
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
<i>End of period, EUR million</i>								
Total direct investment	598	833	1,062	1,125	884	906	1,004	1,149
of which: euro-denominated	580	817	1,043	1,103	866	892	985	1,125
foreign currency-denominated	19	16	19	22	17	15	19	24
accrued income claims from direct investment	9	11	17	20	15	12	16	15
Total indirect investment	1,024	1,020	1,076	1,339	1,946	2,278	2,569	2,774
of which: total of euro-denominated investment in mutual fund shares	964	983	1,039	1,293	1,858	2,126	2,379	2,567
total of foreign currency-denominated investment in mutual fund shares	60	56	38	45	88	152	190	207
Total assets assigned to investment groups	1,622	1,852	2,139	2,464	2,830	3,184	3,573	3,923

Source: OeNB.

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

Table A32

**Transactions and System Disturbances in Payment and Securities Settlement Systems**

	2007		2008		2009		2010		2011	
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
<i>Number of transactions in million, value of transactions in EUR billion</i>										
<b>HOAM.AT</b>										
Number	x	2	1	1	1	1	1	1	1	1
Value	x	2,360	4,364	4,535	4,769	4,950	4,497	3,730		
System disturbances	x	1	4	1	4	4	0	1		
<b>Securities settlement systems</b>										
Number	1	1	1	1	1	1	1	1	1	1
Value	270	255	247	181	184	230	168	246		
System disturbances	0	0	0	0	0	0	0	0		
<b>Retail payment systems</b>										
Number	254	255	273	272	302	299	319	337		
Value	19	20	22	22	24	24	25	24		
System disturbances	17	0	16	5	14	16	9	2		
<b>Participation in international payment systems</b>										
Number	11	12	13	18	13	15	17	17		
Value	1,078	997	998	676	549	594	570	632		
System disturbances	0	0	0	0	0	0	0	0		

Source: OeNB.

Note: The data refer to the six-month period in each case.

Notes

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Applications (in English) should include

- a curriculum vitae,
- a research proposal that motivates and clearly describes the envisaged research project,
- an indication of the period envisaged for the research stay, and
- information on previous scientific work.

Applications for 2012/13 should be e-mailed to

*eva.gehringer-wasserbauer@oenb.at*  
by May 1, 2012.

Applicants will be notified of the jury's decision by mid-June. The next round of applications will close on November 1, 2012.

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