FINANCIAL STABILITY
REPORT 26

Stability and Security.

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The OeNB's semiannual 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.

Contents

Editorial close: November 14, 2013

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

Call for Applications: Visiting Research Program

The Oesterreichische Nationalbank (OeNB) invites applications from external researchers for participation in a Visiting Research Program established by the OeNB's Economic Analysis and Research Department. The purpose of this program is to enhance cooperation with members of academic and research institutions (preferably postdoc) who work in the fields of macroeconomics, international economics or financial economics and/or pursue a regional focus on Central, Eastern and Southeastern Europe.

The OeNB offers a stimulating and professional research environment in close proximity to the policymaking process. Visiting researchers are expected to collaborate with the OeNB's research staff on a prespecified topic and to participate actively in the department's internal seminars and other research activities. They will be provided with accommodation on demand and will, as a rule, have access to the department's computer resources. Their research output may be published in one of the department's publication outlets or as an OeNB Working Paper. Research visits should ideally last between three and six months, but timing is flexible.

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 visit, and
– information on previous scientific work.

Applications for 2014 should be e-mailed to
eva.gehringer-wasserbauer@oenb.at
by May 1, 2014.

Applicants will be notified of the jury's decision by mid-June. The following round of applications will close on November 1, 2014.

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

Management Summary

CESEE Less Affected by Emerging Market Sell-Off

While the U.S. economy has picked up steam and euro area GDP growth shows continued signs of recovery, several emerging economies feel the dual challenges of slowing growth and tighter global financial conditions. The central banks in the advanced economies remain committed to providing sufficient liquidity to financial markets and keep interest rates low for a prolonged period. As a consequence, and supported by bold steps toward a euro area banking union, the remaining financial tensions have eased further.

In general, financial markets in Central, Eastern and Southeastern Europe (CESEE) have been less affected than other emerging market regions by the broader emerging market sell-off that followed the Federal Reserve's communication on the future of its asset purchase program in May 2013. The impact of the Fed's communication was felt more strongly only in markets that received substantial capital inflows in recent years and/or in countries with other pronounced economic imbalances.

Credit dynamics in CESEE were only moderate in the first half of 2013. Most countries reported low or even negative credit growth rates. In part this resulted from their weak economic momentum but also from problems in the respective domestic banking sectors. Credit quality continued to deteriorate in roughly half of the CESEE countries against the backdrop of their weak economic performance and the private sector's impaired credit servicing capacity. Nevertheless, for the CESEE region as a whole lending conditions eased somewhat and consolidated foreign claims of BIS-reporting banks went up in the first half of 2013. In most CESEE countries, the share of foreign currency loans in total loans to households declined somewhat.

Debt Burden of Austrian Corporate and Household Sector Reduced

The Austrian economy remained in the doldrums in the first half of 2013, reflecting above all the difficult external economic conditions. Consequently, corporate profitability continued its downward trend, which began in 2012. Driven by both supply- and demand-side factors, growth of bank loans to corporates has continuously lost momentum since the second half of last year. On the one hand, credit standards for corporate loans had been tightened slightly but continuously for two years in a row. On the other hand, credit demand weakened as firms' financing needs for fixed investment went down somewhat, and at the same time firms increasingly accessed other sources of finance such as bonds, which continued to exceed new bank lending. Although the debt-to-equity ratio increased slightly, the corporate sector's debt servicing capacity remains broadly stable. At the moment, the low interest rates support firms' debt servicing ability although, in the long run, the high share of variable rate loans might expose Austrian enterprises to considerable interest rate risk.

The real disposable income of Austrian households declined in the first half of 2013 on the back of weak wage and economic growth and a slowdown in property income driven, inter alia, by an environment of low interest rates. Reflecting a decline in the savings rate, households reduced their financial investments; bank deposits were even reduced in absolute terms. Growth of banks' lending to households has been

subdued in 2013 so far, with housing loans continuing to grow moderately. Following the successful implementation of various supervisory measures, new foreign currency-denominated lending in Austria is negligible. Nevertheless, the still high proportion of foreign currency loans in total loans remains a major risk factor for Austrian households.

In the first half of 2013, the prices on the Austrian residential property market continued to rise, albeit at a slightly slower pace than in the previous year. In part, this price increase reflects a catching-up movement, as prices had been virtually flat before 2007. Although growth rates of mortgage loans remained moderate during the residential property price hikes, from a financial stability point of view developments of residential property prices certainly merit closer attention.

More Sustainable Earnings and a Stronger Capital Base as Key Challenges for Austrian Banks

The underlying conditions for the Austrian financial sector continued to be challenging in 2013. After a rebound in profitability in 2012, which was driven, inter alia, by one-off effects, banks' profits in 2013 came under pressure from modest new business, rising operating costs and a renewed increase in risk costs as asset quality deteriorated further. To ensure a sustainable recovery, Austrian banks will have to become attuned to a new normality of slow growth, lower profitability and tighter regulation.

Austrian banks' activities in CESEE again contributed substantially to the Austrian banking sector's consolidated profit. However, developments in banks' profitability and credit quality in individual CESEE countries have become more heterogeneous. On the upside, banks are profiting from their strategy of diversifying assets broadly across the region. On the downside, however, the increasing concentration of profits in a small number of countries leads to a higher vulnerability to adverse developments in countries that show high aggregate lending growth. Besides, the higher interest margins of Austrian banks' subsidiaries in CESEE have to be seen in the context of higher risks, as nonperforming loans are still on the rise.

With profits concentrating in a smaller number of countries, Austrian banks started to slightly restructure their balance sheets. Nevertheless, concerns about a widespread deleveraging in CESEE have not materialized. Since the height of the CESEE market turmoil in early 2009, Austrian banks' exposure to the region has even increased and remains broadly diversified, with a focus on investment-grade countries in CESEE.

In the first half of 2013, the Austrian banking system further improved its capitalization. In view of the continuously difficult economic environment and the higher capitalization levels of their international peers, Austrian banks will, however, need to improve their risk-bearing capacity further.

Institutionally, a major step toward a genuine European banking union was achieved with the formal start of the single supervisory mechanism (SSM). Before the SSM will become fully operational, the ECB – together with the competent national authorities – is carrying out a comprehensive assessment of the asset quality of significant banking groups, six of which are Austrian. Among other things, this exercise intends to increase the transparency and comparability of European banks and thereby aims to strengthen public confidence in European financial stability.

In addition to these important microprudential developments, the institutional landscape will see the implementation of a macroprudential policy framework as of 2014. In Austria, the Financial Market Stability Board will be the central body for macroprudential policy coordination. The complementary instruments provided for in the EU legislation that implements Basel III constitute an important step toward macroprudential supervision.

Action Recommended by the OeNB

The OeNB acknowledges the Austrian financial sector's progress toward making the Austrian financial market more stable. Nevertheless, there is still a long way to go toward stronger crisis resilience. Therefore, the OeNB reiterates its recommendations to Austrian banks, calling for

- further improvements in bank capitalization,
- the application of sustainable business models and adequate risk-adjusted pricing in all market segments,
- improvements in banks' efficiency and operational leverage,
- maintaining restraint in foreign currency lending,
- a cautious expansion of business with a particular focus on risk management particularly in markets that show high aggregate lending growth.

International Macroeconomic Environment: Broadly Stable Macrofinancial Development despite Market Turbulences

Advanced Economies: Signs of Moderate Recovery

Global economic activity remained subdued in the review period from June 2013 to October 2013, but the IMF's World Economic Outlook expects further acceleration toward 2014. Economic indicators point toward stronger growth in the United States, and the euro area shows continued signs of recovery as well.

In the U.S.A., year-on-year GDP growth accelerated from 1.3% in the first quarter of 2013 to 1.6% in the second quarter. Driven by the recovery of the real estate sector, an increase in household wealth, the easing of bank lending conditions and a rise in borrowing, private domestic demand remained the main engine of growth while public consumption expenditure, in particular expenditure for national defense, continued to fall. The uncertainty regarding the future path of fiscal policy is a clear downward risk for the 2014 outlook. The Federal Reserve Board's decision of September 2013 not to scale down its asset purchase program calmed the discussion about a possible tapering of its third round of quantitative easing. As the U.S. unemployment rate fell below 7.5% in the review period, markets continue to expect a decrease in asset purchases in the near future. However, the substantial rise in long-term U.S. interest rates for both mortgages and government bonds has slowed down somewhat recently.

Global uncertainty about the U.S. approach to quantitative easing has led to a sharp repricing of emerging market assets since May. In Brazil, India, Indonesia and South Africa, national currencies and bond markets came under intense downward pressure as current account deficits persist, inflation remains elevated and monetary policy room seems limited in the face of decelerating growth rates. Although the IMF's Global Financial Stability Report assumes the situation to stabilize, several emerging market economies remain highly vulnerable to sudden outflows. For 2013, the growth rate of the aggregate of emerging market and developing economies is expected to be 3 percentage points lower than in 2010, while that of advanced economies is expected to be about 2 percentage points lower. A detailed discussion concerning CESEE economies is provided in the next section.

The Swiss National Bank (SNB) has remained committed to its exchange rate ceiling of CHF 1.20 per euro. Although the upward pressure on the Swiss franc was muted in the review period, the SNB is not considering an abolition of the ceiling yet.

In the euro area, quarterly GDP growth was positive at 0.1% in the third quarter of 2013, marking the second consecutive increase in economic activity after six quarters of decline, while the corresponding year-on-year growth rate was still negative at –0.4%. For the full year of 2013, the IMF expects GDP to contract by 0.4%, implying a slight improvement against the July update. While private sector deleveraging, tight lending conditions and uncertainty among businesses and investors remain a drag on growth, the slower pace of fiscal tightening should help stabilize actual demand, especially in 2014. Growth expectations for 2013 and 2014 remain quite heterogeneous across countries: Whereas Spain and

Intensified global discussion about possible future monetary tightening in the U.S.A.

Steps toward banking union support euro area recovery

Italy as well as some smaller countries (Greece, Cyprus, the Netherlands, Portugal and Slovenia) will face recessions, economic growth is expected to be relatively strong in Germany and slightly positive in France. Unemployment rates have stabilized in most euro area countries, while inflation has slowed down considerably, mostly reflecting negative base effects in the energy and food components of the HICP.

During the review period, financial stability improved throughout most of the euro area – a fact that was reflected, inter alia, in slightly lower sovereign risk spreads in stressed economies. The Cypriot authorities have taken decisive steps to stabilize the financial sector, meet the fiscal targets and implement structural reforms, although further challenges lie ahead. Financial assistance programs for individual countries are on track, according to the recent program reviews, with Ireland possibly completing its program by the end of 2013.

The Governing Council of the ECB cut the ECB's key interest rates by 25 basis points in early November 2013, bringing the interest rate on main refinancing operations to a historical low of 0.25%. To anchor market expectations even better, the Governing Council had already announced at its meeting in July that policy rates will remain at low levels for an extended period of time in line with the subdued medium-term outlook for inflation, monetary dynamics and the real economy. Despite significant improvements, the transmission of monetary policy remains impaired for some countries and some economic sectors. Better funding conditions allowed banks in the euro area to repay around EUR 360 billion of outstanding longer-term central bank liquidity since late January 2013, which is around 35% of the original amount of slightly more

than EUR 1,000 billion. So far, the reduction in excess liquidity has not driven money market rates upward.

Recent progress toward a full banking union has reinforced the euro area's collective commitment to the euro. Box 3 below provides an update on the implementation of the single supervisory mechanism (SSM), the upcoming asset quality review (AQR) and the submitted proposals for a single resolution mechanism (SRM).

CESEE: Credit Dynamics Often Muted despite Relatively Little Impact of Financial Market Turmoil

CESEE financial markets have generally been less affected than other regions by the broader emerging market sell-off that followed the Fed's communication on the future of its asset purchase program in May. The risk assessment for the region deteriorated somewhat in June. For most countries, however, this was a temporary phenomenon and CDS premiums and eurobond spreads remained close to the levels observed in early 2013 throughout most of the review period (see chart 1). The impact was felt more strongly and more persistently only in those markets that received more substantial capital inflows in recent years and/or in countries with more pronounced economic imbalances. This is especially true for Russia, Turkey and Ukraine (with the deterioration of the risk assessment for Turkey coinciding with domestic political unrest). For Russia and Turkey, however, financial market sentiment improved in September, when it became clear that the Fed would not scale back its bond buying program as early as previously expected. Only Ukraine saw a further rating downgrade, which reflected weak economic fundamentals including a high current account deficit, declining

Chart 1

Five-Year Credit Default Swap Premiums

Basis points

Latest observation: November 14, 2013

Czech Republic — Poland — Slovakia
Bulgaria — Turkey — Russia

Basis points

Latest observation: November 14, 2013

Ukraine — Slovenia — Croatia
Romania — Hungary
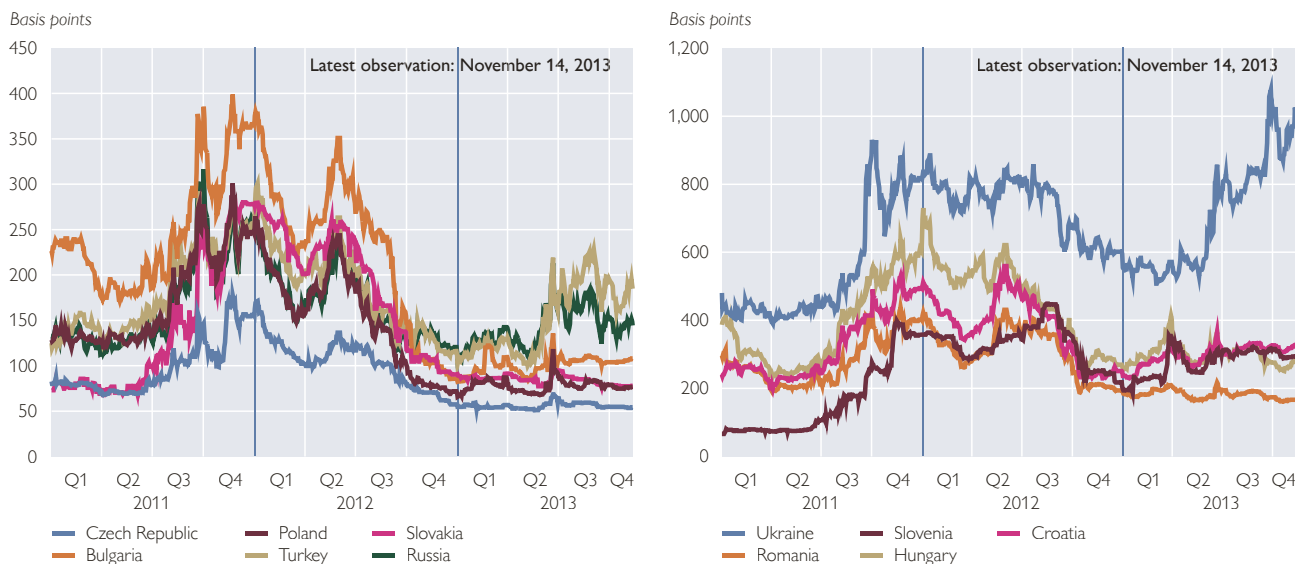
Source: Thomson Reuters.

foreign currency reserves and deteriorating international competitiveness.

CESEE equity markets developed in a broadly stable manner between mid-May and mid-November. More remarkable increases of equity prices were reported for Poland (by around 20%) and Romania (by around 13%), while a strong decrease of equity prices was observed only in Turkey (by around 35%). The sell-off in Turkish equity markets started with the Taksim protests in late May. After another episode of pronounced stock market losses in mid-August, markets recovered somewhat in September. It needs to be noted, however, that Turkish equities are still trading around 50% above their low of late 2011.

Short-term interbank rates continued to be low in most of CESEE. Since May 2013 they have declined more markedly in Hungary, Poland and Romania. This development was related to policy rate cuts, room for which was provided by abating price pressures and a weak economic momentum. In Turkey, however, money market rates increased more notably. Elevated uncertainties regarding global monetary policies caused fluctuations in financial markets, which prompted the Turkish central bank (CBRT) to raise its interest rates (see below) and to tighten its liquidity policy by changing the composition of liquidity injected into the market.

Most of the currencies of the countries under review that have not yet adopted the euro or do not follow a fixed currency peg regime traded at a broadly stable rate against their reference currency from mid-May to mid-November.[1] Some more pronounced exchange rate swings were once again only observed in Russia and Turkey, as these countries were more exposed to international investors' risk reassessment of emerging markets.

Exchange rate pressure has become more pronounced only in a few countries

[1] With the exception of Russia (basket of currencies consisting of U.S. dollar and euro at a ratio of 55% to 45%), Turkey (U.S. dollar) and Ukraine, the reference currency of these countries is the euro.

The Turkish lira depreciated by some 9% against the U.S. dollar from mid-May to mid-October 2013 and was traded at record lows in early September. In stabilizing the currency and fighting capital outflows, the CBRT was reluctant to raise interest rates and relied mainly on direct interventions and liquidity instruments. This policy showed some initial success but proved not to be sufficient in stopping depreciation pressures. Eventually, the lending rate (i.e. the upper band of its interest rate corridor) was raised in two steps from 6.5% in June to 7.75% in August, not yet offsetting previous rate reductions of early 2013, while the one-week repo and borrowing rates have been held constant at 4.5% and 3.5%, respectively.

In Russia, depreciation was less pronounced than in Turkey. The Russian ruble, however, still lost some 5% against its currency basket. As of October 7, 2013, the Russian central bank (CBR) widened the range of the currency baskets' floating operational band (within which it does not conduct interventions) from RUB 1 to RUB 3.1, after the band had been adjusted upward several times over the previous months.

This change was implemented in order to further increase the flexibility of the ruble's exchange rate and to proceed with the gradual transition to a floating exchange rate regime by 2015.

In line with a deteriorating risk assessment, the Ukraine's de facto peg against the U.S. dollar also came under some pressure in September. The Ukrainian central bank resumed direct currency intervention by selling around USD 580 million. It was the first time since April 2013 that Ukraine had intervened in the foreign exchange market to support the country's currency. At the same time and despite the hike in foreign currency demand, depreciation expectations seem to have remained subdued, which is confirmed by abundant liquidity in the local banking system and a continuing shift of retail deposits into the Ukrainian hryvnia. Foreign currency reserves have been declining since May, given redemptions of eurobonds and repayments of IMF funds, and stood at USD 21.64 billion at the end of October 2013 (covering less than three import months). The country is set to repay USD 1.85 billion to its overseas creditors by the end of 2013.

Chart 2

Exchange Rates of Selected Currencies against the Euro

September 1, 2008 = 100; rise = appreciation
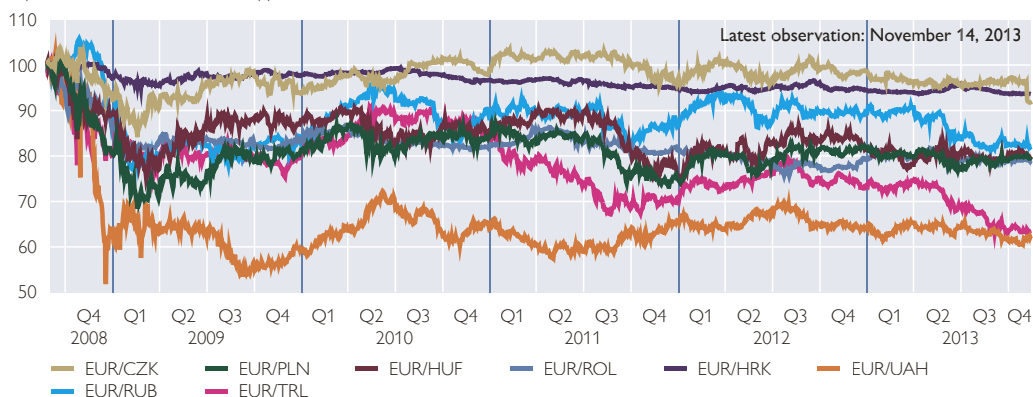
Source: Thomson Reuters.

Credit dynamics were only moderate during the review period. Most countries under observation reported low or even negative credit growth rates. This is especially true for Croatia, Hungary and Slovenia and, to a somewhat lesser extent, also for Bulgaria and Romania.

This development can in part be explained by the weak economic momentum in these countries. Unlike in many other countries of the region, Bulgaria, Croatia and Slovenia remained in recession or stagnation also in the second quarter of 2013, and (quarter-on-quarter) growth in Hungary decelerated markedly from the comparatively good first quarter to the second quarter. Only Romania managed a turnaround, reporting positive GDP growth rates in the first half of 2013.

This development, however, was in part also related to domestic banking sector problems in some countries. In Slovenia a high stock of nonperforming loans (NPLs) is weighing on bank profitability and credit expansion, and banking sector capitalization is low by

regional comparison. In an effort to stabilize its banking system, the country is currently working on a transfer of bad assets from its three biggest, systemically important state-owned banks to a bank asset management company. This transfer is set to be accompanied by capital injections into the respective banks to strengthen their capital base. The budgetary costs of these injections are estimated at a minimum of EUR 1.3 billion, or 3.7% of GDP. In Hungary, the banking system is impaired by various government measures to reduce households' outstanding foreign currency debt as well as by very high sectoral taxes on banks. In order to ease access to credit for SMEs, the Magyar Nemzeti Bank (MNB) started a Funding for Growth Scheme in June 2013. Under this scheme, the MNB provides banks with long-term refinancing at an interest rate of 0%; banks can then lend on these funds to SMEs (with a maximum all-in margin of 2.5%) either for the financing of investment and working capital or the conversion of
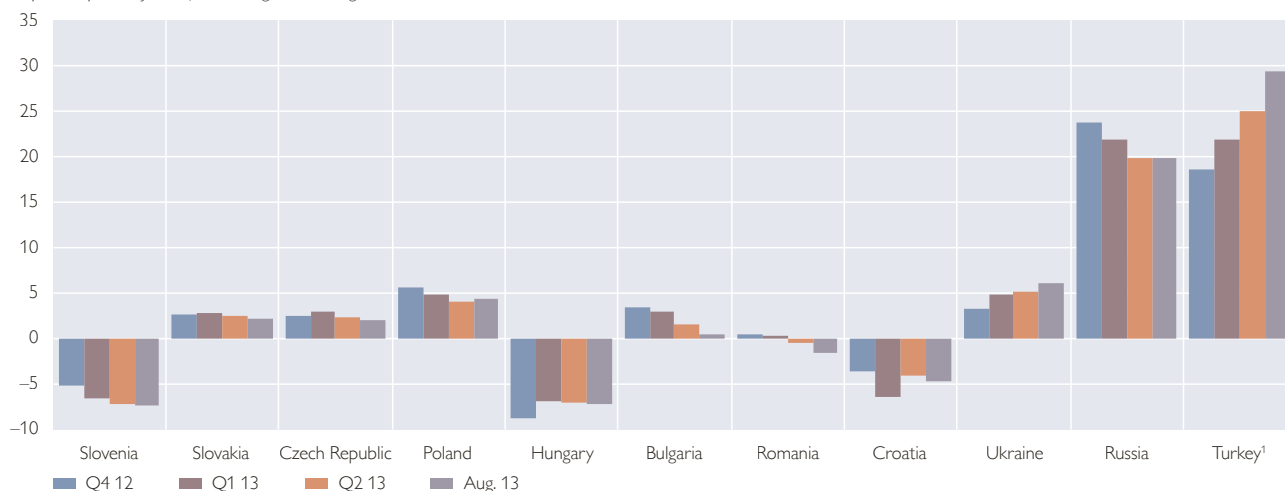
Credit dynamics remained muted in many CESEE countries…

…which was partly related to problems in their domestic banking sectors

Chart 3

Growth of Credit to the Private Sector

%, year on year, adjusted for exchange rate changes

Source: National central banks.

[1] Nonadjusted.

foreign currency loans into Hungarian forint-denominated loans (the MNB also provides the necessary foreign currency for such conversions). As for households, on top of measures already taken, the Hungarian government in November 2013 proposed to expand its existing exchange rate cap scheme in support of foreign currency mortgage holders to borrowers who are more than 90 days behind on their payments or owe more than HUF 20 million (EUR 67,000).

The general weakness of credit expansion is also mirrored in lower consolidated bank exposures of BIS-reporting banks (adjusted for exchange rate changes). More specifically, exposures vis-à-vis Hungary, Romania, Slovenia and Ukraine had been declining for several quarters and continued doing so in the first half of 2013. Bulgaria also reported outflows in the final quarter of 2012 and the first half of 2013.

For the region as a whole, however, consolidated banking exposures of BIS-reporting banks went up in the first half of 2013 against end-2012. The highest increases relative to outstanding stocks were observed in Russia and Turkey, but the Czech Republic, Poland and Slovakia also reported notable rises. Furthermore, surveys like the Emerging Markets Bank Lending Conditions Survey of the Institute of International Finance show that lending conditions in Emerging Europe eased in the first half of 2013. This improvement was driven by an easing of credit standards for most credit categories, growing loan demand (for consumer, housing and particularly business loans, as manufacturing activity and consumption stayed relatively stable) as

well as easing domestic funding conditions. International funding conditions, however, tightened toward the end of the second quarter of 2013 (for the first time since the third quarter of 2012) as expectations about a tapering of asset purchases by the Federal Reserve drove up financial market volatility. As mentioned above, however, this development had a notable impact only on a few CESEE countries.

Against this background and also given an incipient economic recovery, credit stocks increased moderately in the Czech Republic and Slovakia, more substantially in Poland and Ukraine and strongly in Russia and Turkey.

In Turkey, the growth of credit to the private sector gained pace in late 2012 and continued to remain clearly above the central banks' indicative reference value of 15% in August 2013. Waning capital inflows coupled with stricter liquidity conditions did not bring about a notable tightening of credit supply in the second quarter of 2013. Loan demand continued to be robust given that Turkey's was the strongest growth performance in the region. Demand was further fueled by low interest rates and a growing perception that the CBRT's policy rate-cutting cycle has come to an end.

In Russia, credit growth was driven especially by lending to households. This development has to be assessed against the background of strong consumption dynamics fueled in part by rapid increases in wages and pensions. The CBR reacted to the (partly unsecured) consumer credit boom by moral suasion and by passing some prudential measures in late 2012 and early 2013.[2]

While the share of foreign currency loans in total loans to households declined

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[2] *For further information concerning credit developments in Russia, see Barisitz, S. 2013. Credit Boom in Russia depsite Global Woes — Driving Forces and Risks, in this issue of the FSR.*

somewhat in most CESEE countries, and most strongly so in Ukraine (by 4.3 percentage points to 39.9% between end-2012 and mid-2013), it remained at high levels in Croatia, Hungary and Romania (between 55% and 76.5% in July 2013).

Credit quality continued to deteriorate in roughly half of the CESEE countries. This trend was most pronounced in Hungary, Romania and Slovenia, where NPL ratios were more than 3 percentage points higher in mid-2013 than in mid-2012. NPLs also increased noticeably in Croatia and Ukraine, which has to be seen in the context of continuing weak economic conditions as well as low credit dynamics and an impaired credit servicing capacity of the private sector. In some other CESEE countries, however, the quality of the credit portfolio remained stable (Czech Republic, Poland, Slovakia, Turkey) or even improved somewhat (Russia). Nevertheless, NPL ratios remained clearly elevated by historical comparision in all countries of the region but Turkey.

With the exception of the Czech Republic and Slovakia, total outstanding domestic claims continued to exceed total domestic deposits (relative to GDP) in all CESEE countries in mid-2013. Everywhere but in Turkey, however, this funding gap has been narrowing substantially since late 2011. In Turkey, an overhang of deposits over claims turned into a funding gap of close to 9% of GDP in the second quarter of 2013 as deposit growth could not keep pace with vivid credit expansion. Among the other countries of the CESEE region, the funding gap narrowed most pronouncedly in Hungary, Romania, Slovenia and Ukraine (by about some 5 percentage points of GDP between mid-2012 and mid-2013). While in Ukraine deposits grew more strongly than claims, the narrowing of the funding gap was driven by a reduction in claims in the other CESEE countries.

The development of funding gaps outlined above is broadly reflected in banks' net external positions. Countries that reported a narrowing funding gap reduced their reliance on external funding, while countries with larger funding gaps (e.g. Turkey) increasingly turned to international sources to finance

Credit quality continues to be weak

Loan-to-deposit ratio has gone down

Chart 4

Banking Sector: Credit Quality

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

■ Mid-2012 ■ Mid-2013
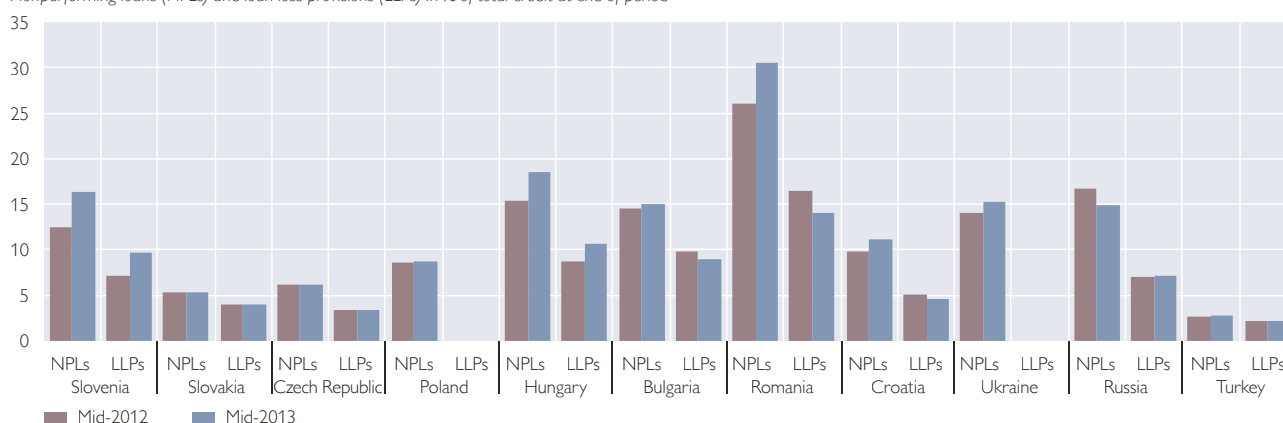
Source: IMF, national central banks, OeNB.

Note: Data are not comparable between countries. NPLs include substandard loans (except for Romania and Ukraine), doubtful and loss loans .

Profits continue to be subdued…

credit expansion. The banking sector continued to hold net external liabilities in most countries, in Croatia, Hungary, Poland, Romania and Turkey at a comparatively high level relative to GDP. The Czech Republic and Slovakia – which both continued to show a surplus of domestic deposits over claims – reported positive net external assets, just like Russia. In the case of Slovakia, however, its international creditor position deteriorated somewhat in the review period.

Banking sector profits remained subdued by historical standards and ranged from a return on assets (RoA) of 0.2% in Ukraine to 2.5% in Turkey in mid-2013. Slovenia was the only country to report losses in the review period (recording a RoA of –1.1%). Here, the weak operating environment, decreasing loan volumes, the deteriorating quality of the credit portfolio and increased competition for deposits are reflected in banks' profitability. Year on year, profitability was somewhat lower also in Croatia and Russia. In both countries this fact was related to higher provisioning. In Croatia, lower operating income played

Chart 5

Banking Sector: Gap between Claims and Deposits and Net External Position

As a percentage of GDP at mid-2013

Legend:
- Domestic claims less private sector deposits
- Net foreign assets (positive value) or liabilities (negative value)
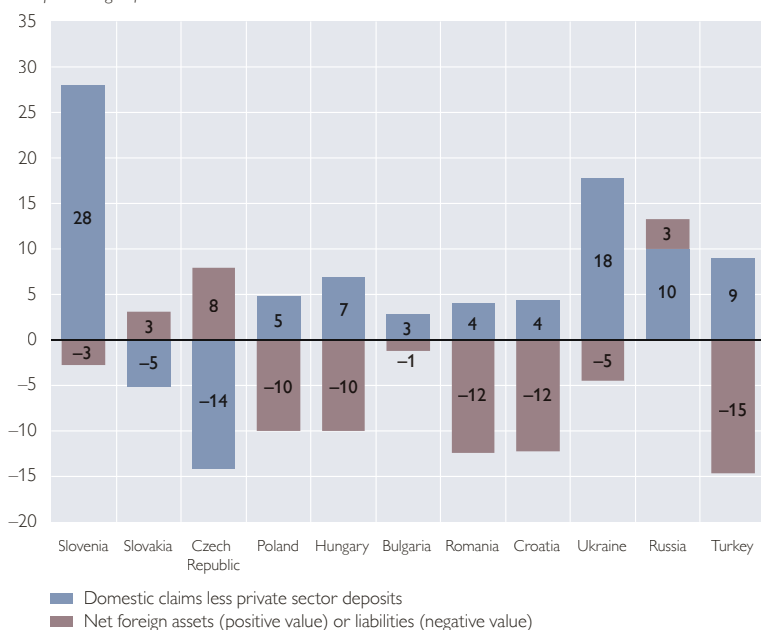
Source: ECB, Eurostat, national central banks, national statistical offices, OeNB.

Chart 6

Banking Sector: Profitability

Return on assets in %

Legend:
- Mid-2012
- Mid-2013
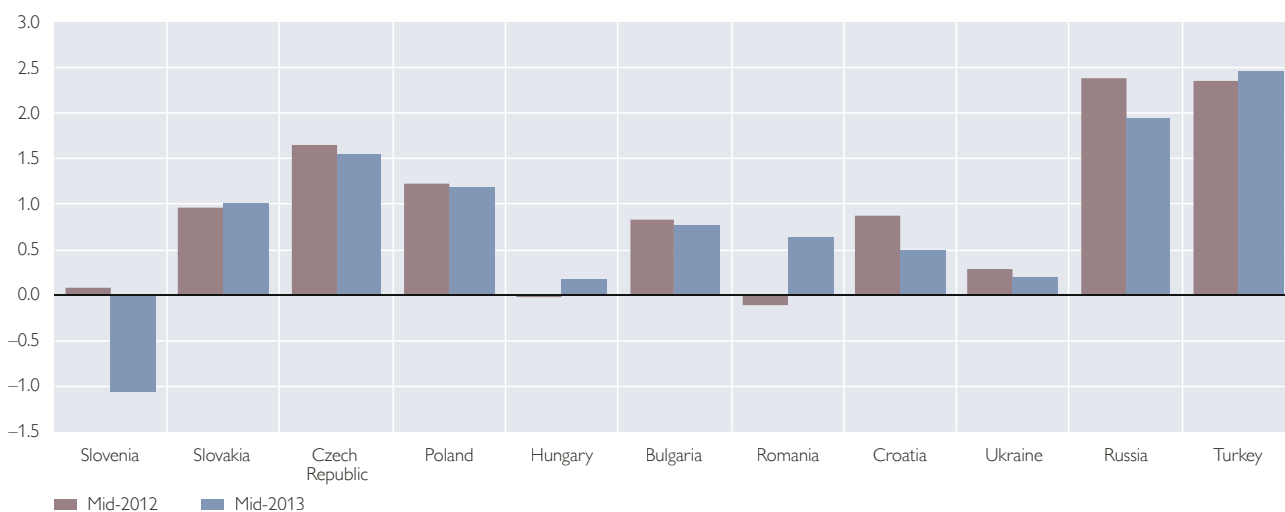
Source: IMF, national central banks, OeNB.

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

a role as well. Some countries of the region, however, reported higher RoAs (e.g. Hungary, Slovakia, Turkey and especially Romania) which were driven mostly by higher operating incomes, and, in Romania, by lower provisions and write-offs.

Mid-2013 data confirm that the banking sectors in CESEE remain well capitalized. Capital adequacy ratios ranged between 13.5% in Russia and 20.8% in Croatia. Compared to mid-2012, the capital adequacy ratio increased in Bulgaria, the Czech Republic, Hungary, Poland and Slovakia (in a range from 0.3 to 0.8 percentage points), while it decreased in the rest of the region. The decrease, however, was comparatively pronounced only in Turkey (–1.6 percentage points).

…but banking sectors remain well capitalized

Corporate and Household Sectors in Austria: Indebtedness Declines

Corporate Sector Risk Indicators Remain Broadly Stable

Stagnation of the Austrian Economy Comes to a Halt

Declining corporate investment

The Austrian economy remained in the doldrums in the first half of 2013, although since the middle of the year, a number of leading indicators have suggested a recovery of the growth momentum. Austria's sluggish GDP growth performance so far in 2013 reflects above all the difficult external economic conditions. With key markets such as Italy, Hungary, the Czech Republic and Slovenia mired in recession, Austrian export growth was weak. While imports declined, net exports were nonetheless the sole driver of GDP growth on the demand side. In view of high uncertainty, poor sales opportunities and below-average capacity utilization, many enterprises have cur-

Falling corporate profits

tailed or postponed their investment plans so that investment activity has declined on a quarterly basis since the second quarter of 2012. The contraction of gross fixed capital formation was driven in particular by cyclically sensitive investment in equipment. By contrast, housing investment registered positive, albeit listless, growth.

Corporate profitability has been on a downtrend since 2012, reflecting the economic slowdown. While corporate earnings were buoyed by falling raw material prices, wage developments had a dampening impact on corporate profitability in 2012 and the first half of 2013. Gross operating surplus was down 2.0% year on year in nominal terms in the second quarter of 2013 (chart 7). However, low interest rates supported the nonoperational component of corporate profitability. While

Chart 7

Profitability of Nonfinancial Corporations

Gross Operating Surplus

Annual change in %, four-quarter moving average
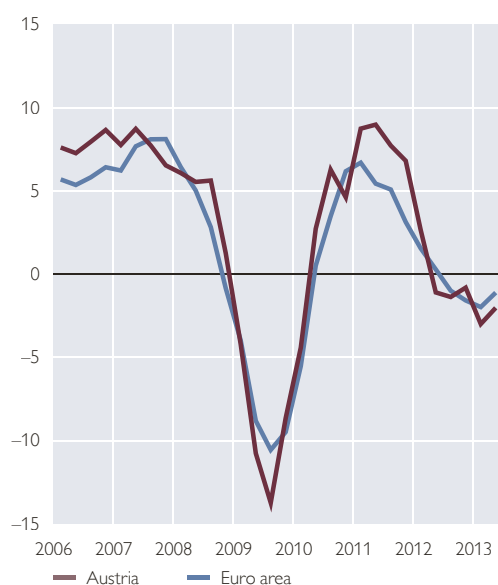
Profit Ratio

Gross operating surplus in % of gross value added, four-quarter moving average

Austria   Euro area
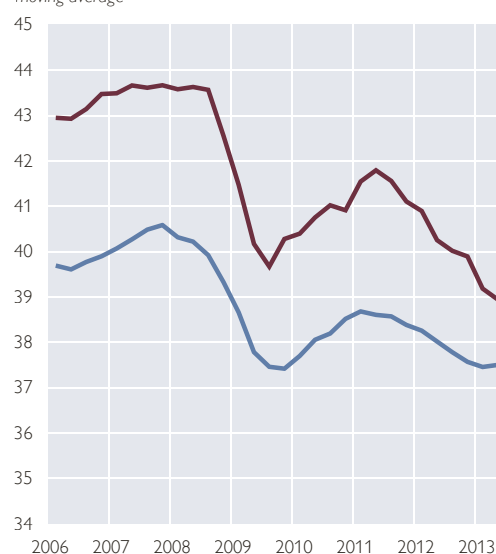
Source: Statistics Austria, ECB.

the gross operating surplus had already surpassed pre-crisis levels in nominal terms in 2011, in real terms as well as in relation to gross value added of the corporate sector (i.e. the gross profit ratio), it has still failed to reach its pre-crisis highs. The gross profit ratio has been on a downward trend for eight consecutive quarters, falling to 39.0% in the second quarter of 2013 and thus sinking below the levels registered at the height of the crisis. However, it was still higher than the comparative value for the whole euro area.

Bank Lending Loses Momentum

External financing of nonfinancial corporations fell to EUR 1.9 billion[1] in the first half of 2013, less than one-fifth of the corresponding 2012 figure according to financial accounts data. This distinct slowdown might reflect high recourse to internal financing as well as lower financing needs due to reduced investment.

Domestic bank loans accounted for around one-third of the Austrian corporate sector's external financing in the first half of 2013, almost twice the comparable 2012 figure. However, since the second half of 2012, the growth of bank loans has continuously lost momentum. According to MFI balance sheet statistics, the annual growth rate of Austrian bank lending to nonfinancial corporations (adjusted for reclassifications, valuation changes and exchange rate effects) fell from 3.4% in nominal terms in August 2012 to a mere 0.5% in September 2013 (chart 8), implying a real decrease.[2] This slowing may be pinpointed mainly to lending at shorter maturities (up to

one year), while loans with longer maturities on which loan growth had rested in the past continued to record positive rates. Despite this deceleration, lending to the Austrian corporate sector could so far escape the reduction witnessed in the euro area as a whole, where the nominal growth rate has been negative since the first half of 2012.

The slowdown in lending was driven by both supply- and demand-side factors. Credit standards for corporate loans had been tightened slightly but continuously by Austrian banks between the second half of 2011 and the second quarter of 2013; in the third quarter of 2013, credit standards remained unchanged according to the Austrian results of the euro area bank lending survey (BLS). This tightening affected large firms somewhat more than small and medium-sized enterprises. The factors behind the more stringent lending policies were costs related to banks' capital position as well as banks' heightened risk concerns, reflecting the economic slowdown. At the same time, the banks surveyed in the BLS noted a slight but continuous decline in corporate loan demand, which came to a halt only in the third quarter of 2013. On the one hand, this decline in demand can be explained by lower funding requirements for fixed investment and falling capacity utilization rates. On the other hand, companies increasingly accessed other sources of finance, such as corporate bonds, as is explained below. Moreover, companies still relied to a considerable extent on internal sources of finance, as they dispose of sizeable amounts of cash to

Tighter credit standards

Bank loans decrease in real terms

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[1] *Adjusted for foreign-controlled holdings in special purpose entities (SPEs).*

[2] *At the cutoff date, financial accounts data were available up to the second quarter of 2013. Therefore, the figures on growth contribution presented here refer to the first half of 2013. More recent developments of financing flows are discussed using data from the MFI balance sheet statistics and the securities issues statistics.*

finance their activities: Corporate bank deposits had expanded vigorously in 2012, although their growth slowed down in 2013 to reach 1.5% year on year in September 2013.

Thus, it looks as if tighter credit standards have so far affected terms and conditions rather than volumes of bank loans. Stronger risk discrimination by banks resulted in wider margins on riskier loans, in part dampening the reduction of financing costs stemming from monetary policy easing. In response to the four ECB interest rate cuts of November 2011, December 2011, July 2012 and May 2013 (by 0.25 percentage points each) and the associated decline in money market rates, corporate lending rates declined by 99 basis points to 1.78% between October 2011 and September 2013.[3] While interest rates fell for all loan volumes and maturities, the decrease was more pronounced for short-term loans and for larger loans (with a volume of more than EUR 1 million).

Bond Financing Exceeds Volume of New Bank Lending

The amount of new bonds issued by Austrian nonfinancial corporations had continued to exceed new bank lending in net terms up to the second quarter of 2013, although their annual growth rate slowed down in the course of this year and – due to high redemptions in that month – fell to 2.4% in nominal terms in September 2013 (according to the securities issues statistics). The ongoing recourse to bonds undoubtedly broadens the corporate sector's financing sources, although this funding option is available only to a limited number of mostly larger companies, a

considerable share of which are majority-owned by the public sector.

After having contracted in 2012 and the first months of 2013, corporate bond yields started to rebound slightly between June and September 2013. Increases were quite uniform across ratings. Yields on AA-rated corporate bonds rose by 68 basis points, those on BBB-rated bonds by 58 basis points, mainly as a result of rising government bond yields. Thus, the spread against long-term German bonds remained broadly constant, reflecting the increased risk appetite of investors. But in a longer-term perspective, financing conditions in the bond market remained favorable, as yields on BBB-rated bonds were 289 basis points and AA-rated bonds yields 186 basis points lower than in October 2011.[4]

Lower Recourse to Trade Credit

The net volume of trade credit drawn by domestic companies decreased by EUR 0.1 billion in the first half of 2013. One reason might be that as a key element of firms' working capital, trade credit develops broadly along the business cycle, another one the fact that in a low interest environment, it becomes comparatively more expensive. At the same time – given its relatively informal form and comparatively high cost – increased recourse to trade finance might be correlated with financial distress, possibly caused by restricted access to other forms of finance. Thus, the lower use of trade credit may also be an indication that bank credit standards, which had been tightened in 2012 and the first half of 2013, were not so restrictive as to drive firms into this kind of finance.

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[3] *The interest rate cut of November 2013 has not yet been reflected in the lending rates available so far.*

[4] *Euro area figures are used here, as no time series is available for yields on Austrian corporate bonds.*

Chart 8

Key Elements of Nonfinancial Corporations' Financing: Volumes and Conditions

Loans: Volumes

Annual change in %[1]
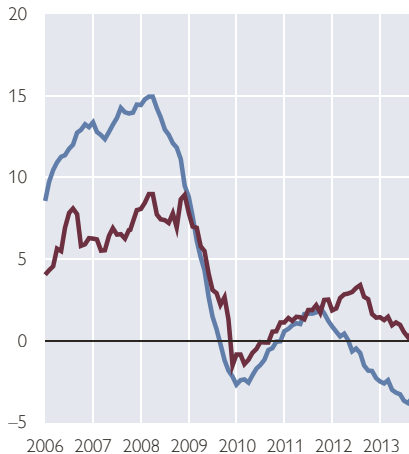
Bonds: Volumes

Annual change in %
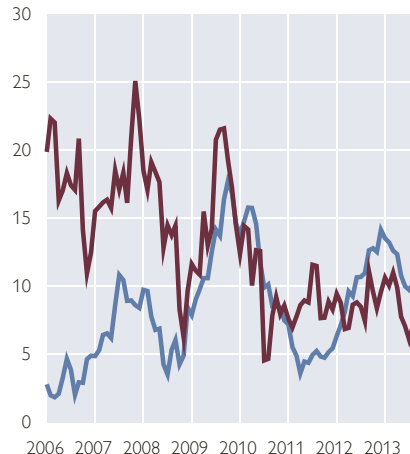
Quoted Stocks: Volumes

Annual change in %
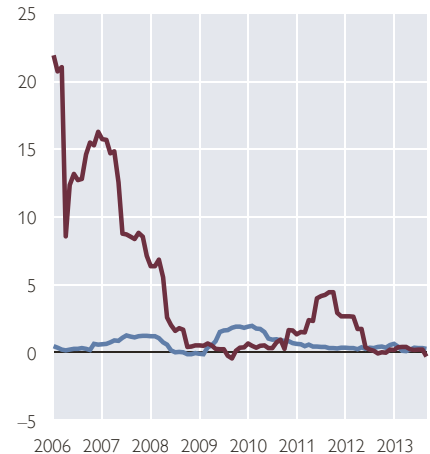
Loans: Interest Rates

%
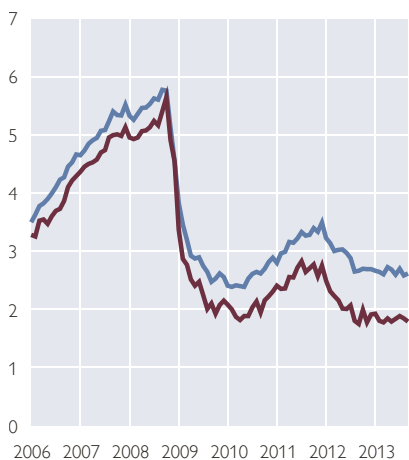
Bonds: Yields

%
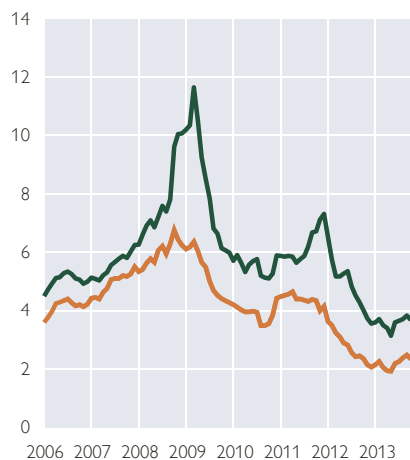
Quoted Stocks: Earnings Yield

%

■ Austria ■ Euro area ■ AA corporate bonds ■ BBB corporate bonds

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

[1] Adjusted for reclassifications, changes in valuation and exchange rate effects.

High Share of Equity

In the first half of this year, almost three quarters of the external financing of nonfinancial corporations came in the form of equity. Financing via listed stocks continued to be affected by the crisis and accounted for just 3% of external financing in the first half of 2013. Netting new listings, capital increases and delistings, the net issuance of capital on the stock exchange amounted to EUR 0.2 billion in the first nine months of 2013 according to securities issues statistics. So the vast majority of the equity raised in the first half of 2013 came in the form of unquoted shares and other equity instruments (EUR 1.3 billion) — mostly from foreign strategic investors.

Stock market financing still affected by the crisis

Measured by the earnings yield (i.e. the inverse of the price-to-earnings ratio) of the ATX, the cost of raising capital on the Austrian stock market fell slightly in the first three quarters of 2013 from 7.0% in December 2012 to 6.8 in October 2013, after the sharp drop seen in 2012 (from 11.6% in December 2011). But as there were virtually no new issues, this cost was mostly a notional figure.

Variable rate loans imply interest rate risk

Corporate Sector's Debt Servicing Capacity Remains Broadly Stable

Debt-to equity ratio increases slightly

Mirroring the strong slowdown in external financing, corporate debt (in terms of total loans and bonds) fell by 0.3% in the four quarters to June 2013. In net terms, enterprises continued to substitute short-term for long-term funding. Long-term financing instruments, which account for more than 85% of outstanding debt, still grew, albeit at a considerably slower pace, while short-term financing diminished in absolute terms from 2012. However, although the growth rate of corporate debt was negative, as corporate earnings declined more strongly, the ratio of corporate debt to gross operating surplus rose slightly, by 9 percentage points, to 542% in the first half of 2013, implying a virtually stable sustainability of corporate debt (chart 9). Thus, the ratio of corporate debt to the gross operating surplus remained considerably above its pre-crisis levels. The debt-to-equity ratio, however, came down slightly to 118% at mid-2013. Both the debt-to-income ratio and the debt-to-equity ratio are currently higher in Austria than in the euro area, which not only highlights the importance of debt financing in Austria but also reflects the ongoing deleveraging of the corporate sector in a number of euro area countries. The share of equity

Falling insolvencies

in the Austrian corporate sector's total liabilities rose slightly from 42.7% at end-2012 to 43.0% in mid-2013.

The low interest rate environment continued to support firms' ability to service their debt. In the first half of 2013, the fraction of corporate earnings (gross operating surplus) that had to be spent on interest payments for bank loans continued to diminish slightly. This decline was reinforced by the very high share of variable rate loans in Austria. While for this reason Austrian companies currently have lower interest expenses than their euro area peers, their exposure to interest rate risk is considerably higher. Thus, a rebound of the interest rate level could create a noticeable burden, especially for highly indebted companies.

The exposure of the corporate sector to foreign exchange risk, which was never as high as that of the household sector, was reduced further in the first three quarters of 2013, as the share of foreign currency loans declined by almost 1 percentage point (nearly 4 percentage points since 2010) to 5.5% and was thus only less than 1 percentage point higher than in the euro area at the end of September 2013.

The number of corporate insolvencies was 5.2% lower in the third quarter of 2013 than in the comparable 2012 period (based on a moving four-quarter sum to account for seasonality); it also dropped markedly in relation to the number of existing companies. This development could be partly due to the moderate development of debt financing and the low interest rate level, which makes debt servicing easier even for highly indebted companies; partly, it might also be because insolvencies usually lag cyclical movements. However, insolvency liabilities rose markedly due to a large-scale bankruptcy.

Chart 9

Risk Indicators for Nonfinancial Corporations

Debt

% of gross operating surplus
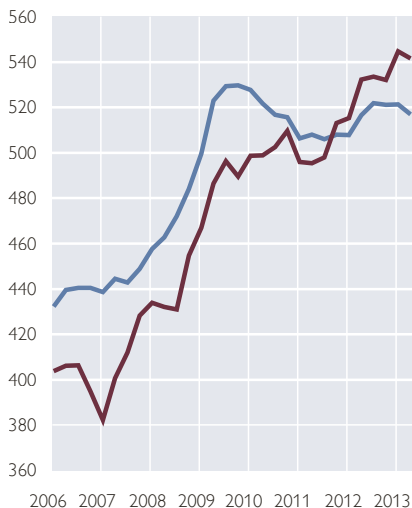
Debt-to-Equity Ratio[1]

%
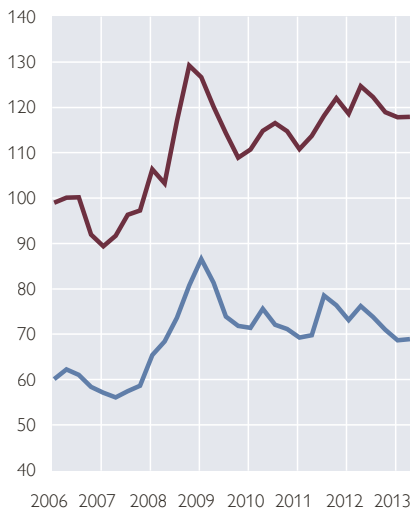
Interest Expenses[2]

% of gross operating surplus
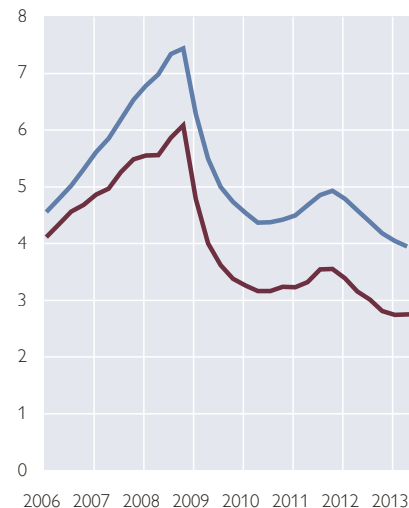
Variable Rate Loans

% of total new lending
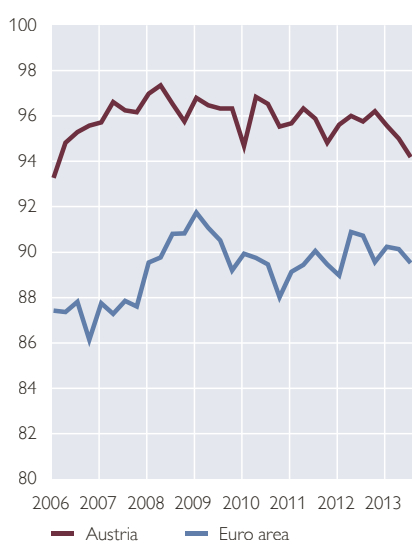
Foreign Currency Loans

% of total loans
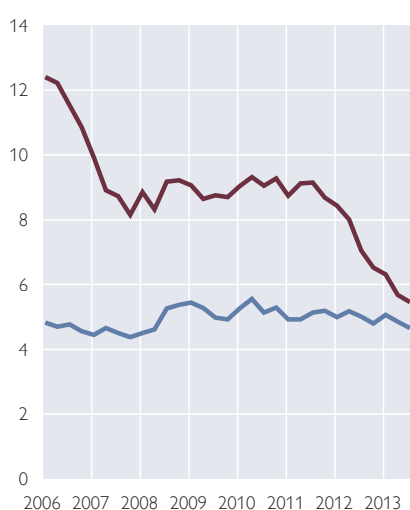
Insolvencies

Number of insolvencies in % of companies, four-quarter moving sum
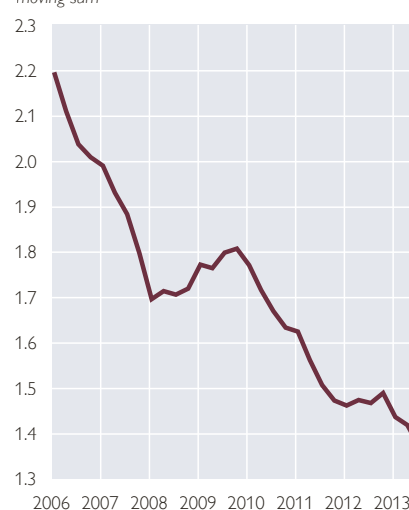
—— Austria —— Euro area

Source: OeNB, ECB, Eurostat, KSV 1870.

[1] *Austria: Equity without SPEs.*
[2] *Euro area: euro loans only.*

Households' Foreign Currency Debt Remains a Concern Despite Marked Reductions

Real Income Decreases

Despite the sluggish economic momentum, the Austrian labor market has registered a rise in employment in 2013 so far. Yet real disposable household income fell in the first half of 2013, reflecting weak real wage growth as well as a decline in property income. This, in turn, constrained personal consumption. At the same time, the savings rate declined in the first half of 2013. On the one hand, the low interest rate environment may have reduced

Low saving ratio

the attractiveness of saving. On the other hand, the decline in the saving ratio may reflect the languid development of property income – the portion of disposable income that is more likely to be saved than labor income.

Household Financial Investment Declines

Capital market investment remains positive in the first half of 2013

After the slight rebound in 2012, financial investment by households[5] continued to recede in the first half of 2013 and, at EUR 2.3 billion, was 12.9% lower than in the second half of 2012 – and less than one-quarter of the pre-crisis peak value recorded in 2007 (chart 10).

Bank deposits of households fall

In the first half of 2013, households pulled EUR 0.9 billion out of their bank accounts in net terms. Looking at the maturity structure, deposits with longer maturities have declined in 2013 so far, whereas large inflows into overnight deposits were recorded. This shift to shorter maturities suggests that

households have a high preference for liquid funds; it may also be connected to the moderate opportunity cost resulting from low interest rates. Broken down by types of deposit, demand and time deposits continued to grow while savings accounts decreased on balance. Deposits at building and loan associations represented the only exception: They rose by 3.8% in the third quarter of 2013 on the back of the comparatively attractive interest rates for building loan contracts.

Households' net financial investment in capital market assets remained positive in the first half of 2013, although it fell to EUR 0.6 billion (against EUR 1.0 billion in the second half of 2012). Households reduced their holdings of long-term debt securities but increased their holdings of mutual fund shares. Additionally, households slightly increased direct holdings of equities, both because the interest paid on deposits was low and because share

Chart 10

Changes in Households' Financial Assets

Determinants of Changes in Financial Assets

EUR billion

Components of Financial Investment

EUR billion

| Financial investment | Valuation changes |
| Other changes | Total change in financial assets |

| Deposits | Capital market investments |
| Life insurance and pension funds | Other | Total |

Source: OeNB.
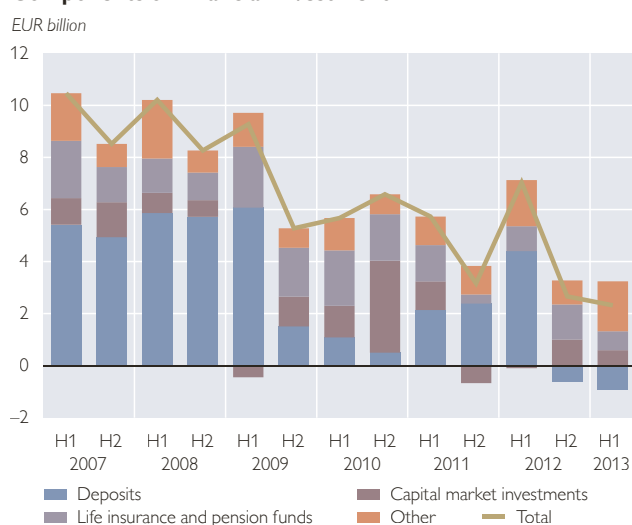
[5] *Nonprofit institutions serving households are not included here.*

prices recovered in international markets in the course of 2013.

At EUR 0.7 billion, investment in life insurance and pension funds still had a stabilizing effect on financial investment in the first half of 2013, accounting for roughly one-third of financial investment in this period. However, a large share of inflows into these instruments was not the result of current investment decisions, but – given the long maturities and commitment periods – reflected past decisions. Demand for funded pension instruments is a key factor in this context. Moreover, life insurance policies are often used as repayment vehicles for foreign currency bullet loans.

After recording (unrealized) valuation gains in their securities portfolios in 2012, Austrian households registered (equally unrealized) valuation losses in the first half of 2013. Coming to EUR 1.3 billion, these losses were equivalent to 1.3% of households' securities holdings 12 months earlier. Quoted stocks, debt securities and mutual fund shares registered (unrealized) valuation losses of roughly the same dimension. Totaling financial investment, valuation losses and other changes, households' financial assets rose by EUR 1.0 billion in the first six months of 2013.

Weak Lending Growth in 2013

Growth of bank lending to households has been subdued in 2013 so far even if annual growth rates, which had contracted continually for almost two years, recovered slightly since the middle of this year. In September 2013, bank loans to households (adjusted for reclassifications, valuation changes and exchange rate effects) increased by a mere 0.8% in nominal terms, implying a fall in real terms.

A breakdown by currencies shows that euro-denominated loans continued

to expand briskly (September 2013: 5.0%), while foreign currency loans continued to decrease by double-digit rates – in September 2013, they had fallen by 12.3% year on year. Broken down by loan purpose (chart 11), the slowdown in loan growth was driven by a decline in consumer loans as well as other loans, which both contracted by 1.1% in September 2013 year on year. Housing loans still grew by 2.1% year on year, and since April 2013, their growth rates have stabilized. The favorable financing conditions probably still supported the dynamics of housing loans, and households might have needed more funding to purchase real estate, as housing prices have been on the rise in Austria (see below). Other housing market indicators, however, pointed to a downturn in credit demand. Although no current data on newly completed housing projects are available, the considerable fall in the number of residential building permits last year (–12.6% over the previous year) suggests a reduction in construction activity, although the number of residential building permits rebounded quite strongly in the first half of 2013.

Loan conditions remained favorable. Interest rates for short-term loans (up to one year) stood at 2.84% in September 2013, 0.70 percentage points below their October 2011 level, reflecting the key interest rate cuts of November 2011, December 2011, July 2012 and May 2013 and the associated decline in money market rates. Looking at data across the entire maturity band, interest rates on new housing loans stood at 2.49% in September 2013, which was 0.55 percentage points lower than the value recorded in October 2011. In the same period, interest rates on consumer loans dropped by 0.28 percentage points to 4.85%.

Life insurance investment has a stabilizing effect

(Unrealized) valuation losses

Financing conditions remain favorable

Foreign currency loans continue to decline

Chart 11

MFI Loans to Households: Volumes and Conditions

Housing Loans: Volumes

Annual change in %[1]
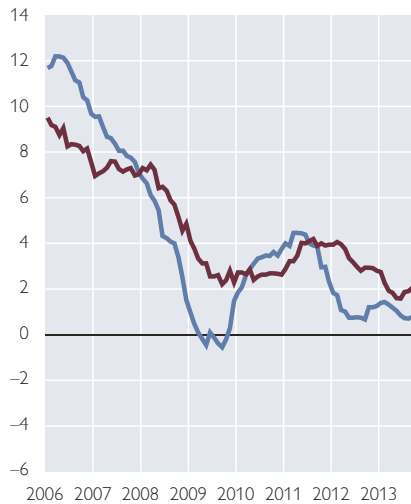
Consumer Loans: Volumes

Annual change in %[1]
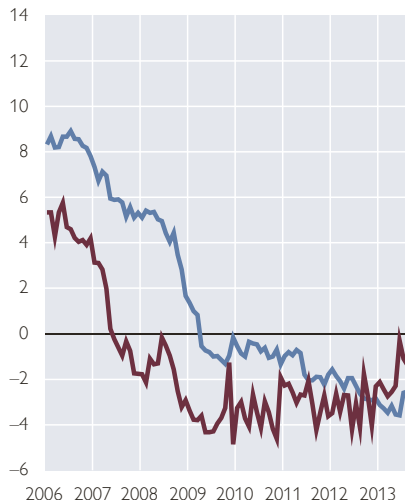
Other Loans: Volumes

Annual change in %[1]
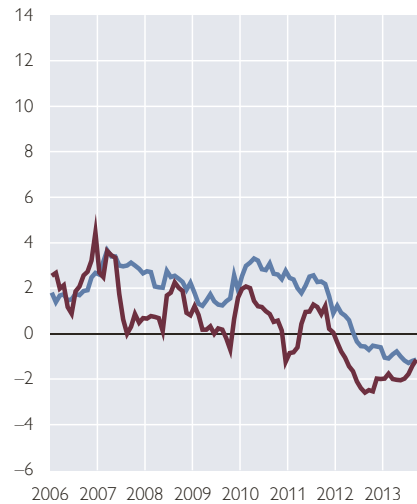
Housing Loans: Interest Rates

%
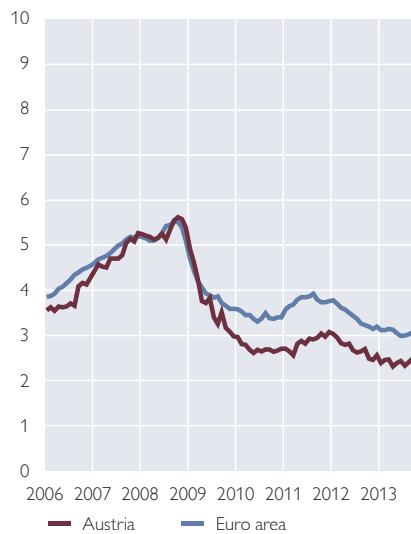
Consumer Loans: Interest Rates

%
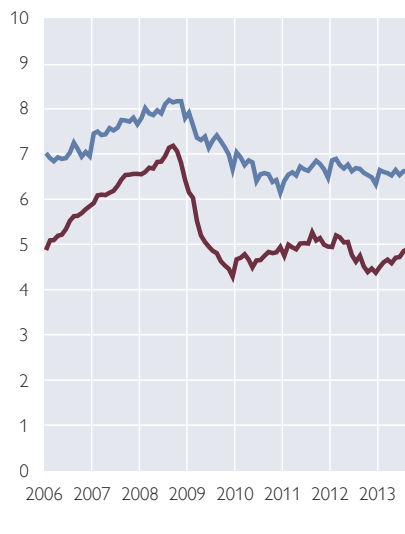
Other Loans: Interest Rates

%

Austria   Euro area
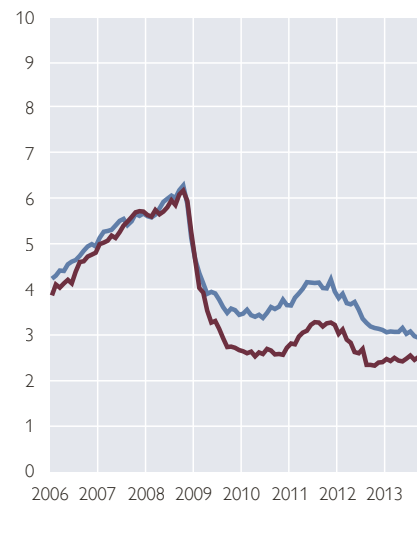
Source: OeNB, ECB.

[1] *Adjusted for reclassifications, valuation changes and exchange rate effects.*

Households' Currency and Interest Rate Risks

Household debt falls slightly

By international comparison, the indebtedness of Austrian households is rather low. At mid-2013, total household liabilities stood at EUR 166.9 billion according to financial accounts data, down by 1.0% in nominal terms from the 2012 year-end value. As a percentage of net disposable income, household debt amounted to 93.4% (+0.7 percentage points from end-2012; see chart 12). The debt ratio of households in Austria thus remained lower than in the euro area as a whole (105.5%).

Given the combination of moderate debt growth and low interest rates, household interest expenses remained subdued. They amounted to 2.0% of disposable income in the first half of 2013, about 2 percentage points less than in 2008, before interest rates began to fall. One factor that accelerated this decline was the high share of variable rate loans: In the third quarter of 2013, 89.4% of new loans were granted with an initial rate fixation period of up to one year, which is a very high share by international comparison. Therefore, when the ECB lowered its key interest rates during the crisis, lending rates in Austria were reduced at a faster rate than those in the euro area; in addition, retail rates in Austria have generally been below euro area rates in recent years. Moreover, loan quality may have also played a role, given the comparatively modest indebtedness of Austrian households.

The still high proportion of foreign currency loans in total loans remains a major risk factor for the financial position of Austrian households. Although the share of foreign currency loans in total loans has fallen by more than 9 percentage points since 2008, 21.2% of the total loan volume to Austrian households was still denominated in foreign currency in the third quarter of

Interest expenses decrease further

Share of foreign currency loans drops rapidly

Chart 12

Household Risk Indicators

Liabilities
% of disposable income
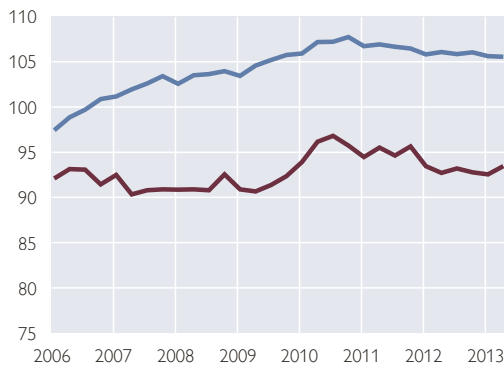
Interest Expenses
% of disposable income
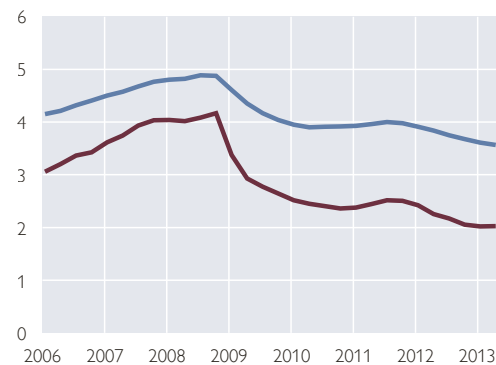
Foreign Currency Loans
% of total loans
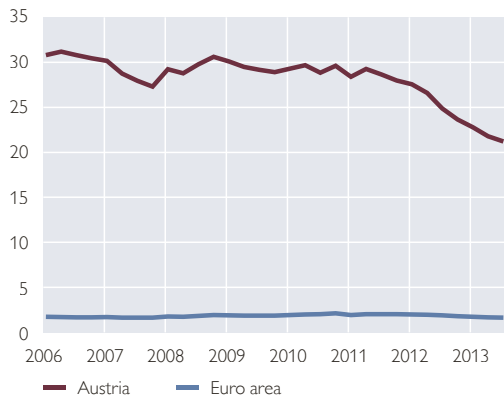
Variable Rate Loans
% of total new loans
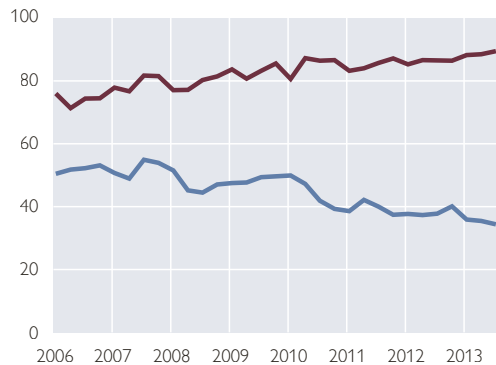
— Austria — Euro area

Source: OeNB, Statistics Austria, ECB, Eurostat.

Note: Figures for the euro area repersent only the interest rate expense on euro-denominated loans.

2013. This considerable reduction highlights the effectiveness of the Austrian Financial Market Authority's minimum standards for granting and managing foreign currency loans, which aim at substantially limiting new foreign currency lending to households.[6] Almost 95% of the foreign currency loans outstanding were denominated in Swiss francs, around 5% in Japanese yen. Since September 2011, when the Swiss National Bank set a maximum exchange rate of CHF 1.20 to the euro, the appreciation of the Swiss franc had come to a halt.

Residential Property Prices Continue to Rise

In the first half of 2013, prices in the Austrian residential property market continued to rise, albeit at a slightly slower pace than last year. In Vienna, where price hikes had been especially pronounced, prices surged 8.3% year on year, while in Austria without Vienna, the price increase was 3.4%. Since 2007, residential property prices in Austria have soared by almost 37% between 2007 and the second quarter of 2013, which contrasts with a slight reduction of residential property prices in the whole euro area (chart 13). To some degree, the price increases in Austria reflect a catching-up, as prices had been virtually flat in the years before 2007. Other factors behind these price developments were increased demand due to immigration and possibly also a flight to real assets.

Thus residential property price increases in Austria not only far surpassed the rate of general price increases by far but also the rise in net disposable income, reducing the affordability of housing notwithstanding the interest rate reductions of the past years. From an investor's perspective, the rising ratio of property prices to rents in Vienna indicates a decreasing yield on property investments, implying that factors other than pure yield considerations played a role.

While the developments of residential property prices – in Austria in general and in Vienna in particular – certainly merit closer attention from a financial stability view, a number of factors might put these developments into perspective somewhat: Growth rates of mortgage loans were moderate during the price hikes, and household debt is low in an international comparison. Moreover, the construction sector is not inflated, as the share of housing investment in GDP has risen only very moderately since the onset of the price increases.[7]

[6] *In January 2013, the Austrian Financial Market Authority (FMA) published a new version of its Minimum Standards for the Risk Management and Granting of Foreign Currency Loans and Loans with Repayment Vehicles. Prepared in cooperation with the OeNB, the new version specifies more stringent guidelines for dealing with foreign currency loans.*

[7] *For a more detailed analysis of the Austrian residential property market, see Schneider, M. 2013. Are Recent Increases of Residential Property Prices in Vienna and Austria justified by Fundamentals? In: Monetary Policy and the Economy Q4/13.*

Chart 13

Residential Property Price Indicators

Residential Property Price Index

2007=100
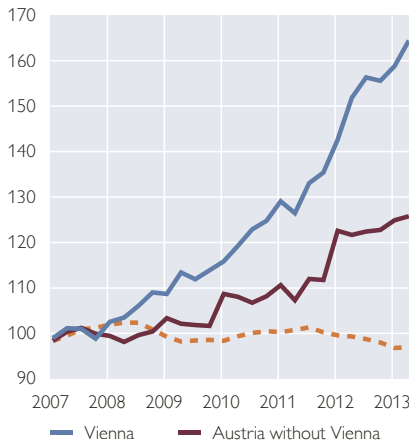
Index in Terms of Net Disposable Income¹

2007=100
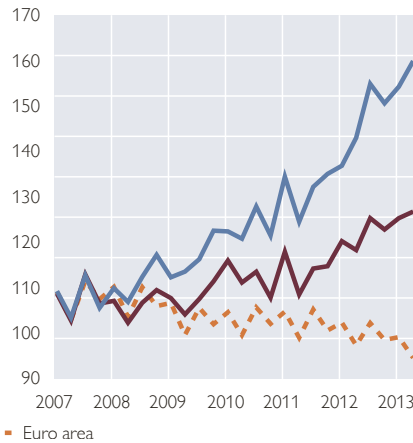
Index in Terms of Rents²

2007=100

— Vienna — Austria without Vienna ···· Euro area
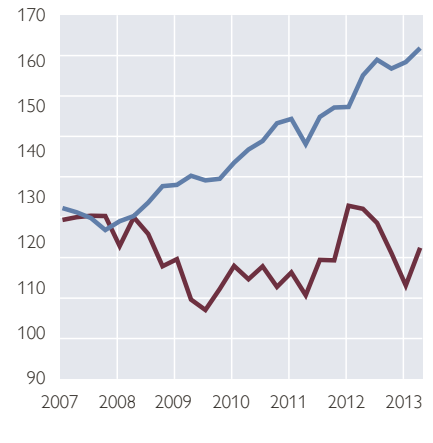
Source: OeNB, Vienna Technical University, ECB, Statistics Austria.

¹ *Residential property price index divided by index of net disposable income of households.*
² *Residential property price index divided by index of apartment rents.*

Box 1

<div style="background:#e8ecf3;padding:1em;">

Austria's Fiscal Advisory Council Will Be Part of the Newly Established Governance System in the EU

The Strengthened Fiscal Surveillance Framework of the European Union

The newly implemented fiscal framework of the EU for preventing and correcting excessive government deficits in the Member States consists of a complex system of preventive and gradual enforcement mechanisms that include multidimensional fiscal rules and surveillance procedures at the EU level as well as at the national level. According to the Treaty on Stability, Coordination and Governance in the Economic and Monetary Union as well as Directive 2011/85/EU and Regulation (EU) No 473/2013 (the "Two-Pack"), compliance with prudent fiscal policymaking is to be supported by country-specific numerical fiscal rules, transparency requirements, standards for budgetary frameworks, common timelines and independent bodies at the national level. Fiscal councils (independent bodies) at the national level "shall … provide public assessments with respect to national fiscal rules", among other things related to significant deviation from the medium-term budgetary objective or the budget adjustment path toward it, and with respect to budgetary forecasts of the government authorities, as stipulated in Article 4(4) and Article 5 of Regulation (EU) No 473/2013. According to Article 4(4) of Regulation (EU) No 473/2013, the national medium-term fiscal plans and draft budgets have to be based on independent macroeconomic forecasts, and the budgetary forecasts have to be produced or endorsed by independent fiscal councils. Austria's multidimensional numerical fiscal rules were established by the Austrian Stability Pact of 2012, with headline and structural budgetary limits, expenditure limits and public debt limits at the central and subnational levels of the state. Strong, country-specific numerical fiscal rules consistent with the budgetary objectives at the EU level and independent fiscal councils are seen as cornerstones of the strengthened EU budgetary surveillance framework.

</div>

Austria's Fiscal Advisory Council (Fiskalrat)

In Austria, the Government Debt Committee, which was established in 1970 and hosted by the OeNB from 1997, was endowed with fiscal monitoring functions in accordance with EU law. The Government Debt Committee has recently been renamed and is now the Fiscal Advisory Council ("the Council"). It was constituted in November 2013 in accordance with the Federal Law Gazette I No. 149/2013 (adopted in July 2013). Its mandate is broad and comprehensive: The Council has the formal legitimation to comment and make recommendations on all matters of fiscal policy and on other matters of the general orientation of economic policy insofar as it is related to fiscal policy.

Tasks According to the Austrian Federal Law Establishing the Fiscal Advisory Council (No. 149/2013)

The Council has to take part in governing the public debt of all levels of government (i.e. central government, provinces and municipalities) and the social security funds in Austria with the following main duties:

- *Assessing the current fiscal situation and compliance with the national fiscal rules with an outlook for the future;*
- *Analyzing the economic effects of financial operations in connection with the indebtedness;*
- *Analyzing the sustainability and the quality of budgetary policies;*
- *Providing recommendations and reports on the fiscal policies, taking economic and financial market conditions, the national fiscal rules, the EU regulations and Austria's fiscal policy objectives into consideration;*
- *Contributing to shaping public opinion in connection with its tasks.*

Institutional Setting of the Fiscal Advisory Council

The institutional design of the Council will be similar to that of the Government Debt Committee. The Council also has 15 members and 15 deputy members, three of them without voting rights. Six members are appointed by the federal government (among them the Council's president). The Austrian Federal Economic Chamber and the Austrian Federal Chamber of Labour nominate three members each. The nominees without voting rights are delegated from the Conference of Provincial Governors and from the associations of cities and municipalities. Furthermore, representatives of the OeNB and the Parliamentary Budget Office are entitled to take part in every meeting of the Council in an advisory capacity. Since 1970, the body and its predecessor have had four presidents, all of them university professors of economics. Members of the Fiscal Advisory Council must be recognized specialists in the fields of fiscal and budgetary matters. Under the new law, they are not permitted to request or take instructions from the body by which they have been appointed or from any other organization. All members of the Council will be appointed for a period of six years (four years for the predecessor body). Resolutions are passed by a simple majority. In the event of a tie, the Chairperson has the casting vote. The Council establishes its own rules of procedure; it may install subcommittees and nominate additional experts. The Council's staff is provided by the OeNB, and the Council is organized as a separate unit in the Economic Analysis Division.

Austrian Financial Intermediaries: Achieving Sustainable Profitability and Strengthening the Capital Base Remain Key Challenges

The business environment for the Austrian financial sector has remained challenging since the publication of the previous Financial Stability Report in June 2013. Under difficult macroeconomic conditions, the profitability of the Austrian banking system weakened in the first half of 2013, reflecting faltering net interest income and a further deterioration of asset quality, especially in CESEE. Nevertheless, the region remains an important contributor to profitability, although increasingly heterogeneous developments across countries entail a growing concentration of Austrian banks' CESEE activities on a handful of profitable markets.

To ensure a sustained recovery, Austrian banks have to tackle the challenges of a "new normality" in banking, which is characterized by slow growth, lower profitability and tighter regulation; they have to continue to address weaknesses such as the cost base and below-average margins in Austria.

Some success has been achieved over the previous years by increasing capitalization, but given the current fragile environment and higher capital adequacy ratios posted by banks in the peer group, the OeNB still considers a further strengthening of the capital base as crucial. With that in mind, banks should focus on core business areas and even consider selling off (non-core) assets where appropriate.

Further steps have also been taken in the implementation of financial reforms both on the national and the international levels. In July 2013, the Austrian Banking Intervention and Restructuring Act was adopted. In the same month, the Austrian Alternative Investment Fund Managers Act entered into force. On the European level, the Capital Requirements Regulation (CRR) and Capital Requirements Directive (CRD) IV were published. All those steps will increase financial stability and lay the foundation for banking union. A successful banking union needs strong institutions. The formal enactment of the single supervisory mechanism (SSM) in October was – institutionally – a large step toward a true banking union. Before the SSM becomes fully operational, the ECB –

Chart 14

Key Indicators for the Austrian Banking System

- June 2012, adjusted for one-off effects[10]
- Dec. 2012, adjusted for one-off effects[10]
- June 2013
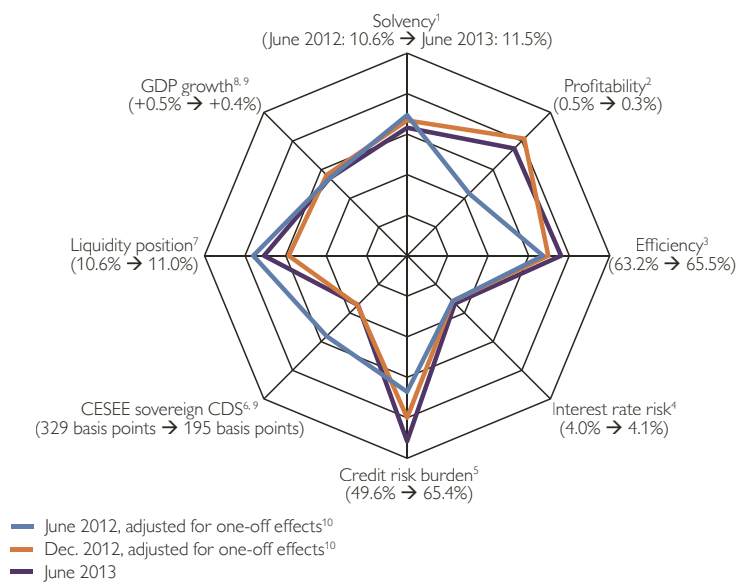
Source: OeNB.

[1] Tier 1 ratio.
[2] Return on assets after taxes.
[3] Cost-to-income ratio.
[4] 200 basis point interest rate shock (loss of eligible capital).
[5] Credit risk provisions in % of operating result.
[6] Exposure-weighted sovereign CDS spread.
[7] Cumulative counterbalancing capacity in % of total assets.
[8] Real GDP growth per annum.
[9] Most recent value available at the cutoff date.
[10] Effects related to capital measures of several banks.

Note: Consolidated figures, largely scaled on the basis of historical data. **The closer the data points fall to the center, the better the ratios and the lower the risks are.**

together with the national competent authorities – is carrying out a comprehensive assessment of the asset quality for significant banking groups, six of which are Austrian. This exercise is to increase the transparency and comparability of banks and therefore enhance confidence in financial stability in Europe. Going forward, besides a rigorous analytical and comparable design of the exercise across jurisdictions, an effective framework for dealing with insolvent institutions together with credible national backstops will be critical for the success of banking union.

A New Normality in the Banking Industry

The mispricing of risks in the run-up to the financial crisis continues to place a significant burden on the balance sheets of creditors and banks in Europe as the deleveraging cycle in the real economy and the banking sector continues. Moreover, regulatory reform requirements aimed at preventing a recurrence of past mistakes contribute to a new normality of lower growth and lower returns that banks need to adapt to.

Setback in Consolidated Profitability of Austrian Banks in 2013

In the euro area, the profitability of significant banks, i.e. banks that will be directly supervised by the ECB under the SSM, remained subdued in the first half of 2013.[1] This is especially true for banks from countries with stressed sovereign and macroeconomic conditions, which result in high credit risk costs and sluggish revenue growth.

After a rebound in 2012, the consolidated profitability of the Austrian banking system has been affected by increasing risk costs, while low interest rates and sluggish lending growth have put pressure on inter-

Chart 15

Profitability of the Austrian Banking System
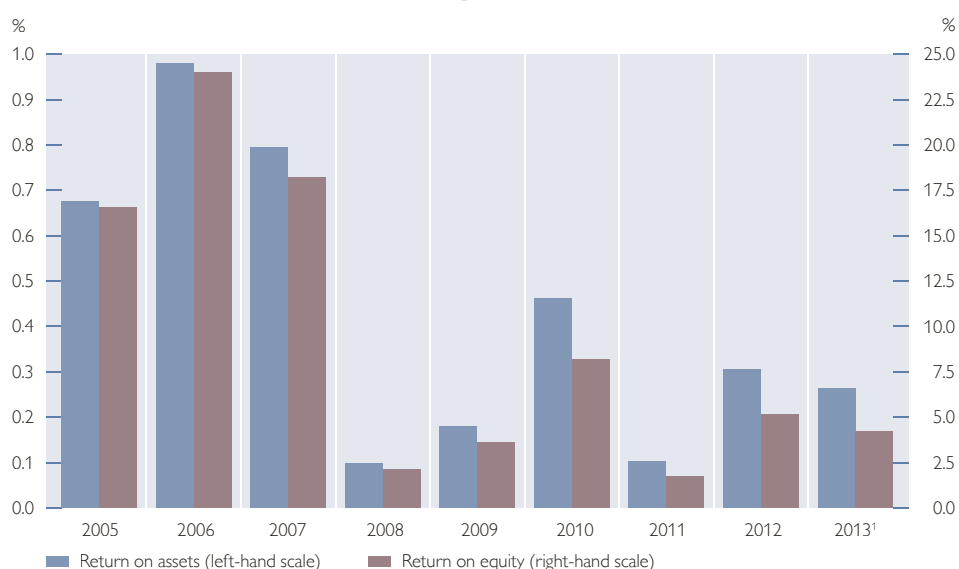
Source: OeNB.

[1] Estimate based on Q2 data.

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[1]   See also ECB (2013). Financial Stability Review. November.

est income. In the first half of 2013, Austrian banks' consolidated net profits after taxes fell by nearly 60% to EUR 1.1 billion. Even adjusted for one-off effects in 2012,[2] results declined by about one-third, keeping banks' profitability well below pre-crisis levels (see chart 15). Reflecting the continued unfavorable economic prospects in Western Europe and adverse developments in individual CESEE countries, risk costs have been rising (see further below), putting pressure on banks' profitability. Moreover, in light of low margins in the domestic business, weaker new business and the ongoing low interest rate environment, net interest income – by far the most important source of income – declined by 4.2% on a consolidated level in the first half of 2013 compared to the previous year. However, income on fees and commissions grew, primarily on the back of an improved securities business, by 3.3% year on year. Apart from that, an increasing cost-to-income ratio points to some deterioration of banks' cost base. Another factor impacting banks' profitability are bank levies in several core markets. Some of these levies are particularly burdensome in times of low income, as they are not based on current profits but on measures of size to varying degrees.

Austrian banks are still facing weak profitability in the domestic market. Operating income has declined since 2011, as new business is sluggish and margins remain low due to growing operating expenses (see chart 16)[3] and tight competition. The latter is reflected, for instance, in the average

branch density of the Austrian banking system of nearly 1.900 inhabitants per branch, which is substantially below the European average of 2.300 (see chart 17[4]). Another piece of evidence is the situation of inherently low interest margins in the domestic market. Together with the Belgian banking system, Austria registers the lowest interest margin rates within the EU. Lending rates for new consumer loans in Austria have increased steadily, however, but are also well below the European average.

In addition to improving the income-based earnings potential, further consolidation and efficiency-enhancing efforts announced by several banking groups are desirable and need to be continued. Furthermore, an effective bank recovery and resolution framework will, once in place, play an important role in this respect. It will reduce the

Chart 16

Components of Operating Profit of the Austrian Banking System

Annual change in %
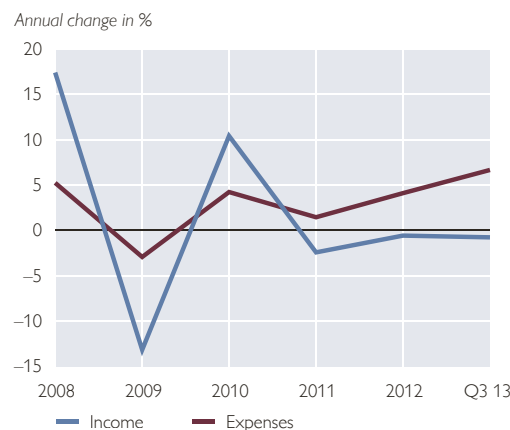
Source: OeNB.
Note: Unconsolidated data.

Operating profit in Austria remains weak as income decreases and expenses rise

[2] The rebound in 2012 was substantially driven by one-off effects, i.e. mainly repurchases of hybrid capital.

[3] Unconsolidated operating costs are somewhat overestimated as administrative expenses related to the activities of Austrian subsidiaries in CESEE are covered by headquarters in Vienna.

[4] In Austria the increase in the number of branches in 2011 (mirrored in a slump of the red line in chart 17) was driven by a one-off effect, as most of the post offices took on banking services. The dotted line therefore shows the change in branch density without this effect.

Chart 17

Bank Branch Density

Number of inhabitants per branch
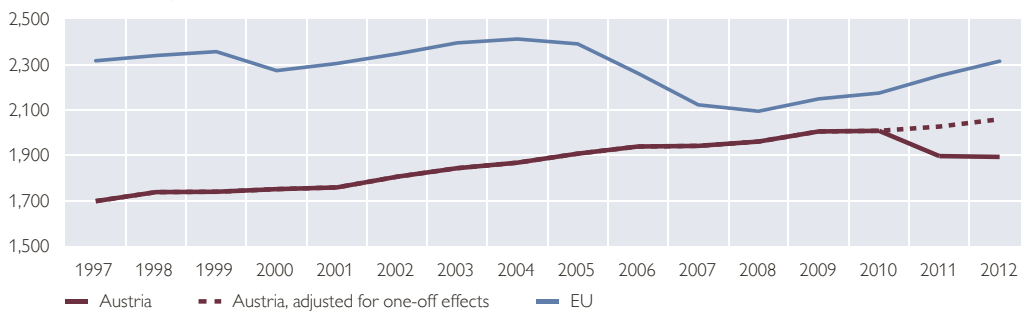
Source: OeNB, Eurostat.

value of implicit guarantees[5] and thus affect banks' profits.

The profits of Austrian subsidiaries remained substantial in the first half of 2013. Austrian subsidiaries in CESEE generated nearly EUR 1.4 billion in profits in the first six months of 2013. Operating profits weakened and risk provisioning was almost unchanged, nevertheless, profits remained flat compared to the previous year, which resulted mainly from a one off-effect in Romania. The annualized return on assets of all subsidiaries in CESEE is currently expected to come in at around 1% for 2013.

Interest rate income fell by 2.7%, driven by material declines in the Czech Republic, Croatia and Ukraine. Nevertheless, margins in CESEE are still significantly higher than in the Austrian market and to some extent compensate for banks' higher risk costs in the region. Higher interest margins in CESEE are, however, also linked to the subsidiaries' retail-oriented business model.

This notwithstanding, the profitability of Austrian banks' subsidiaries in CESEE is *getting increasingly heterogeneous.* The wide distribution of profits of Austrian subsidiaries across CESEE has diminished over the past few years; recently, profits have been up only in a handful of countries, namely the Czech Republic, Slovakia, Russia and Turkey[6] (see chart 18). With regard to the profitability of the latter two markets, however, exchange rate effects on the valuation of the equity position in the respective subsidiaries have to be taken into account. In Romania, profitability remains fragile as recent results are based on one-off effects, and Croatia is facing sustained macroeconomic difficulties that are now beginning to significantly eat into profits, implying a limited future earnings potential. Previously profitable markets like Hungary or Ukraine became loss generating — macroeconomic imbalances as well as political and/or regulatory risks are reasons behind this development and may continue to affect bank profitability in these markets. On the upside, this growing concentration reflects well on banks' strategy of broad asset

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[5] See the paragraph on banks' liquidity situation below.

[6] As a significant joint venture in Turkey is not included separately under the Austrian supervisory reporting, the results are not included in the analysis of subsidiaries. In the first half of 2013, the joint venture generated profits of EUR 320 million.

Chart 18

Distribution of Profits of Austrian Subsidiaries in CESEE

EUR billion
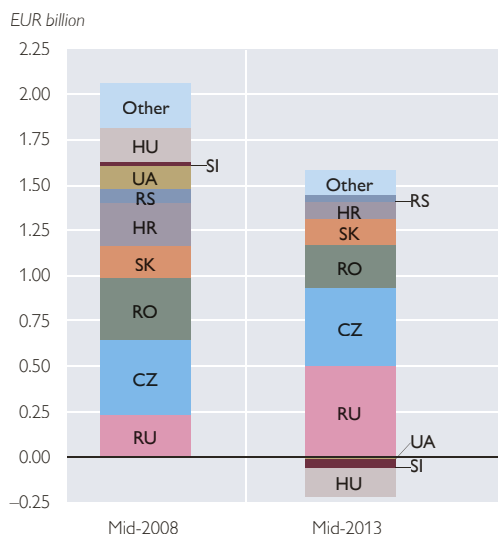
Source: OeNB.

diversification across the region. On the downside, however, the dependency on a few countries underpins the need to pursue growth in a sustainable way.

In the light of rapid credit growth in countries like Russia and Turkey, Austrian banks should heed the lessons from past boom phases and proceed with

due caution and a focus on risk management.[7] While business in these countries is particularly attractive at the moment, as it involves comparatively high margins and low risk costs on the back of high economic growth, low market penetration as well as a still modest level of private sector indebtedness, banks need to be cautious, heeding the lessons from past rapid credit expansions in CESEE, especially with respect to stepped up risk buffers and risk management practices.

Credit Risk Costs Remain Elevated

The asset quality of significant euro area banks, especially of smaller banks, continued to deteriorate in the first half of 2013.[8] Differences in nonperforming loans and provisioning trends across countries have mainly been driven by cyclical factors. Both the upcoming comprehensive assessment of banks' risk exposures under the SSM and initiatives to harmonize the definitions of nonperforming loans across jurisdictions are welcome steps toward increasing the transparency and comparability of banks' credit risk metrics.

Box 2

Harmonized Definitions of Nonperforming Exposures and Forbearance Are Key in Enhancing Transparency in Asset Valuations

Nonperforming exposures (NPEs) are exposures that are classified as either defaulted according to the regulatory framework or impaired according to the applicable accounting framework (except for exposures with incurred but not reported losses under IAS 39), and all exposures that meet the following harmonization criteria:

− (Harmonized) entry criteria: An exposure has to be considered nonperforming when it is 90 days past due and/or the debtor is unlikely to pay its credit obligations without collateral realization. This applies even if the exposure is not recognized as defaulted or impaired in accordance with the applicable accounting framework.

− Pulling effect: All exposures to a debtor have to be considered as nonperforming when its on-balance sheet exposures that are 90 days past-due reach 20% of the outstanding amount of the on-balance sheet exposures to that debtor, even if no pulling effect is used for the default or impairment classification.

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[7] Since end-2009, the loan volume of Austrian subsidiaries in Russia and Turkey has risen by roughly two-thirds. See also Barisitz, S. 2013. Credit Boom in Russia despite Global Woes − Driving Forces and Risks, in this issue.

[8] See also ECB (2013). Financial Stability Review. November.

– *Exit criterion: A nonperforming exposure is reclassified as performing when all the uncertainties about the likeliness of repayment have been lifted, meaning the exposure is not more than 90 days past due.*
– *A nonperforming exposure which is also forborne is not allowed to exit the NPE category for one year (from the point of its declaration as forborne) – in which the debtor has to prove her/his ability to meet the restructured conditions – even if forbearance has led to the exit from the default or impairment categories.*

When an exposure meets the entry criteria, it is considered as nonperforming even if it is fully collateralized. The NPE definition applies to all loans, debt securities, loan commitments and financial guarantees in the banking book.

Forborne exposures *are debt contracts in which concessions toward a debtor facing or about to face difficulties in meeting its financial commitments ("financial difficulties") have been granted. Concession refers to either of the following actions:*

– *a modification of the previous terms and conditions of a contract the debtor is considered unable to comply with due to its financial difficulties ("troubled debt") to allow for sufficient debt service ability that would not have been granted had the debtor not been in financial difficulties;*
– *total or partial refinancing of a troubled debt contract that would not have been granted had the debtor not been in financial difficulties.*

Evidence of a concession includes: a) difference in favor of the debtor between the modified and the previous terms of the contract; or b) cases where a modified contract includes more favorable terms than other debtors with a similar risk profile could have obtained from the same institution.

Both, the NPE and the forbearance definitions aim at increasing the comparability of data concerning asset quality. This will lead to greater transparency and should address concerns regarding the asset quality of the European banking sector. The implementation of both definitions will require changes in banks' IT systems. First regulatory reports on both metrics are expected to be available by end-2014.

The asset quality of Austrian banks continued to deteriorate on a consolidated basis. While it has remained fairly benign in the domestic market, the credit quality of Austrian banks' CESEE subsidiaries has again worsened. The share of nonperforming loans in the Austrian banking system increased slightly in the first half of 2013 as a result of sluggish or negative credit growth and continued inflows of net NPLs. This is especially true for banks' foreign operations, where the consolidated NPL ratio (the share of nonperforming loans in total nonbank loans) climbed to 8.8% in June 2013. In contrast to that, the unconsolidated NPL ratio (as a proxy for domestic business) remained quite close to 4.5%. The persistently high level of NPLs also led to high consolidated current credit risk costs in the first half of

2013. Net flows of loan loss provisions amounted to EUR 3.2 billion, representing an increase by about EUR 500 million compared to the first half of 2012 (see chart 19). It has to be noted, however, that this increase was driven to a significant part by developments in one state-owned bank that had to raise provisioning significantly in the course of 2013.

Despite some large corporate defaults in the domestic market, credit quality in Austria remained largely unchanged in the first three quarters of 2013. This is confirmed by the unconsolidated LLP ratio (stock of specific loan loss provisions as a share of total nonbank loans), which has remained slightly above 3% since 2009. The consolidated loan loss provision ratio – representing the stock of loan loss provisioning – has

Quality of domestic loan portfolio remains stable

Chart 19

Consolidated Credit Risk Costs and NPL Ratios of Austrian Banks

EUR billion

Consolidated credit risk costs, flows (left-hand scale)
Consolidated NPL ratio, end-of-period stocks (right-hand scale)
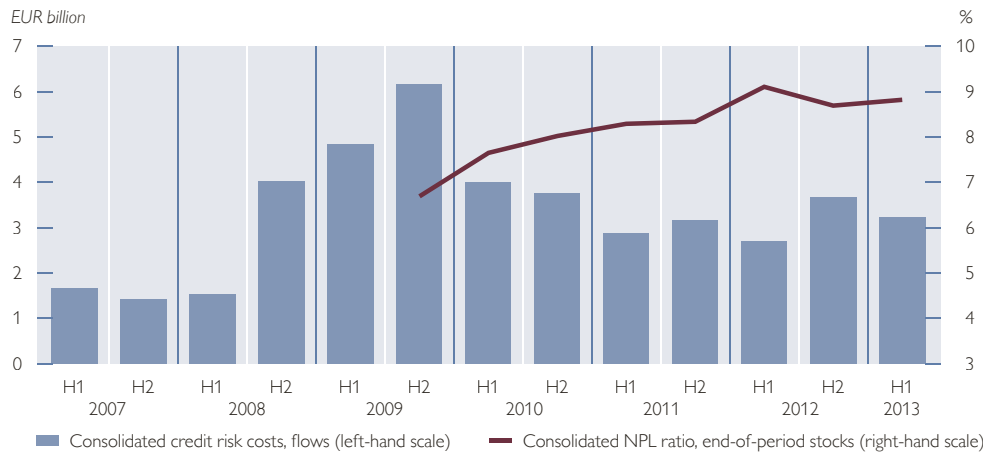
Source: OeNB.

Chart 20

Loan Loss Provisions of Austrian Banks

Unconsolidated loan loss provision ratio
Loan loss provision ratio of foreign subsidiaries of
Austrian banks
Consolidated loan loss provision ratio
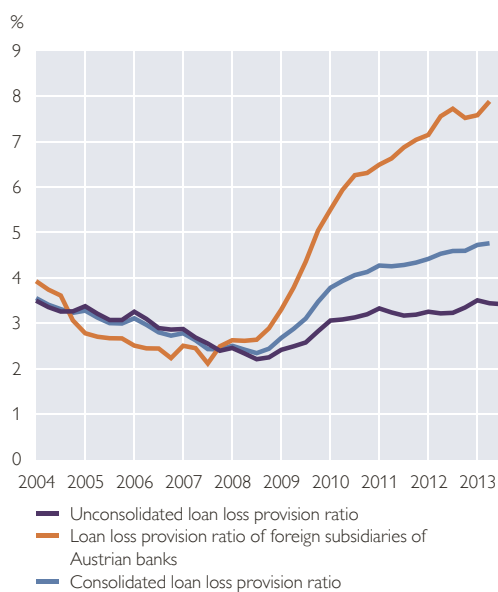
Source: OeNB.

Note: All ratios refer to nonbank loans (end-of-period stocks).

continued to grow quite steeply (see chart 20), a development that was mainly driven by Austrian banks' CESEE business.

The overall NPL ratio of the top 6 Austrian banks' CESEE subsidiaries increased further, from 14.8% in December 2012 to 15.3% in June 2013, while the NPL ratio of foreign currency loans increased from 19.4% to 20.2% over the same period, reflecting the additional risk embedded in this type of lending instruments. Overall, this increase was driven especially by developments in Croatia, Romania, Slovenia and Hungary. At the same time, country-specific differences with respect to NPL ratios remain high, reflecting heterogeneous economic developments in CESEE as well as different definitions of nonperforming loans.[9] The NPL ratio remained below 10% and even decreased in some of the most important host countries of Austrian banks (e.g. in the Czech Republic, Russia and Slovakia), while it reached levels close to or above 20% in many Southeastern European countries.

The coverage of NPLs by loan loss provisions and collateral improved in recent years, with the NPL coverage

Increase of nonperforming loans in CESEE; differences across countries remain significant

[9] See Barisitz, S. 2013. Nonperforming Loans in CESEE – An Even Deeper Definitional Comparison. In: Focus on European Economic Integration Q3/13.

ratio I (ratio of loan loss provisions for NPLs to NPLs) increasing to 49.0% in June 2013 from 47.9% in December 2012. The NPL coverage ratio I for foreign currency loans increased in the same period from 42.6% to 44.4%. Due to the high share of mortgage loans in the CESEE region, the NPL cover-age ratio II, which includes eligible collateral according to Basel II for NPLs in the numerator, is significantly higher and amounted to 68.6% in June 2013 (68.7% in December 2012). The coverage ratio II for foreign currency loans in CESEE slightly declined to 66.5% in June 2013 from 66.9% in December 2012.

Box 3

Preparations for a European Banking Union

Over the past year, good progress has been made toward the creation of banking union.[1] On October 15, 2013, the EU Council adopted a regulation establishing the single supervisory mechanism (SSM) for banks in the euro area,[2] which entered into force in November. In fall 2014, banking supervision at the European level will be fully operational.

The ECB has cooperated closely with the national supervisory authorities in preparing the implementation of the SSM. Strategic and other decisive issues are being discussed and negotiated by the High Level Group chaired by the president of the ECB.

The SSM Regulation (SSMR) sets out the tasks of banking supervisors and the effective organization of supervision. Major current challenges are the establishment of the Supervisory Board and organizational structures as well as the formation and staffing of the Joint Supervisory Teams (JSTs). The JSTs will be in charge of the supervision of a "significant entity or group" and will be composed of a team of supervisors, coordinated by an ECB staff member and one or several sub-coordinators from the national competent authorities (NCA).

Besides that, Article 6 SSMR stipulates that the ECB in consultation with the national competent authorities is to adopt a framework to organize the practical arrangement for implementation. Currently the ECB and national central banks are working on detailed operational arrangements, which are supposed to be reflected in the framework regulation and should embrace, among others, the institutional set-up of the SSM and the cooperation between the SSM and other competent authorities and institutions. This comprises:

– the functioning of the SSM, the JSTs, their role and how NCA staff members are involved in JSTs;
– the organization of on-site inspection teams, their composition and how coordination between JSTs and on-site inspection is ensured; and
– the procedures for the adoption of supervisory decisions.

Before the SSM becomes fully operational in November 2014, the ECB together with the NCAs is carrying out a comprehensive assessment of significant banking groups.[3] The scope of the exercise is unprecedented. Overall, 128 banking groups in 18 Member States are participating in the comprehensive assessment, approximately 85% of euro area bank assets are covered. In Austria, the following six banking groups are currently undergoing the comprehensive assessment: BAWAG P.S.K, Erste Group Bank AG, Raiffeisenlandesbank Oberösterreich AG, Raiffeisenlandesbank Niederösterreich-Wien AG, Raiffeisen Zentralbank Österreich AG, Österreichische Volksbanken-AG with credit institutions affiliated according to Article 10 of the CRR.

[1] *For more information on the architecture of banking union, see Huber D. und E. von Pföstl (2013). The Single Supervisory Mechanism within the Banking Union – Novel Features and Implications for Austrian Supervisors and Supervised Entities. In: Financial Stability Report 25.*

[2] *Council Regulation (EU) No 1024/2013 of 15 October 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions.*

[3] *Article 33 of the SSMR states that the ECB "shall carry out a comprehensive assessment, including a balance sheet assessment, of the credit institutions of the participating Member State. The ECB shall carry out such an assessment at least in relation to the credit institutions not covered by Article 6(4)".*

The exercise started in November 2013 and will take 12 months to complete. It is carried out in collaboration with the NCAs of the Member States that participate in the SSM and is supported by independent third parties at all levels at the ECB and at the NCAs.

The exercise has three main goals:
- *transparency – to enhance the quality of available information on the condition of banks;*
- *repair – to identify and implement necessary corrective actions, if and where needed;*
- *confidence building – to assure all stakeholders that banks are fundamentally sound and trustworthy.*

The comprehensive assessment rests on three pillars:
- *a supervisory risk assessment (RAS) addressing key risks in banks' balance sheets, including liquidity, leverage and funding;*
- *an asset quality review (AQR) to enhance the transparency of bank exposures by reviewing the quality of banks' assets, including the adequacy of asset and collateral valuation and related provisions; and*
- *a stress test providing a forward-looking view on banks' shock-absorbing capacity to be conducted by the ECB and the European Banking Authority (EBA).*

While the three elements are closely interlinked, the main component is the asset quality review. The asset quality review is risk-based and concentrates on risky or nontransparent parts of individual banks' balance sheets. The asset quality review consists of three key parts: 1) selection of portfolios considered to be risky or nontransparent 2) on-site reviews of portfolios identified in the selection phase and 3) collation and quality checks to ensure consistency and comparability of results.

The assessment is based on a capital benchmark of 8% common equity tier 1, drawing on the definition of the Capital Requirements Directive IV/Capital Requirements Regulation, including transitional arrangements, for both the AQR and the baseline stress test scenario. The details concerning the stress test will be announced at a later stage, in coordination with the EBA.

The comprehensive assessment will conclude with an aggregate disclosure of the outcomes at country and bank level together with any recommendations for supervisory measures. This comprehensive outcome will be published prior to the ECB assuming its supervisory role in November 2014 and will include the main findings of the three pillars of the comprehensive assessment.

Work is also continuing on the second building block of the institutional framework for banking union: the single resolution mechanism[4] (SRM). The SRM will be the body responsible for resolving banks and, in particular, coordinating the application of resolution tools to EU banks and ensuring that taxpayers should no longer be first in line to pay for the costs of bank failures. Any resolution costs would have to be borne mainly by shareholders, followed by creditors and by the use of resolution funds. The latter would be built up gradually through bank levies. The European Commission has already submitted two proposals to address these issues:

First, the proposed Directive on Bank Recovery and Resolution (BRRD), adopted by the European Commission in early June 2012 and agreed by the Ecofin Council on June 27, 2013, is now being discussed by the European Parliament. The directive is to provide a comprehensive and effective arrangement to deal with failing banks at the national level. The BRRD includes key elements of prevention, preparation, early intervention and credible resolution tools. It is expected to be finalized at first reading by way of "trilogue" before the end of this year and should enter into force on January 1, 2015.

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[4] *Proposal for a Regulation of the European Parliament and of the Council establishing uniform rules and a uniform procedure for the resolution of credit institutions and certain investment firms in the framework of a Single Resolution Mechanism and a Single Bank Resolution Fund amending Regulation (EU) No 1093/2010 of the European Parliament and of the Council.*

[5] *Proposal for a Directive of the European Parliament and of the Council establishing a framework for the recovery and resolution of credit institutions and investment firms.*

Second, the European Commission submitted a regulation proposal for a single resolution mechanism (SRM) providing a central decision-making body and including a Single Resolution Fund. In contrast to the BRRD, the proposal on the SRM will apply only in SSM-participating Member States. The draft proposal should be adopted by the Council at the end of 2013 and be finalized before the end of the current European parliamentary term in May 2014. The new regime is to be applied from January 1, 2015, together with the BRRD. The SRM framework still contains controversial issues regarding design, mission, the legal basis (e.g. transfer of sovereignty) and distribution of competencies, which are now being negotiated by the European Council working group. Moreover the SRM is closely aligned to other important initiatives, including the European Stability Mechanism's involvement in direct bank recapitalizations, state aid rules and the bail-in tools linked with burden-sharing arrangements.

Sluggish Credit Growth

In the euro area, bank lending has remained generally subdued but sector and country developments continued to be diverse. While in the EU peripheral countries, lending – especially to non-financial corporations – continued to decline strongly, lending volumes in other countries, especially loans to households, grew moderately.[10]

Although credit growth in Austria turned slightly negative for the first time since 2010,[11] it is still above the European average, as the decline in growth rates in other countries was even more pronounced. In CESEE, the bulk of new lending by Austrian subsidiaries was attributable to selected countries. The total volume of loans to nonbanks shrank slightly, by 2% compared to the previous year.

The decline in lending in Austria has been driven by both supply- and demand-side factors (see the section on Corporate and Household Sectors in Austria in this report). By September 2013, loans to domestic nonbanks amounted to EUR 329 billion, down 0.4% year on year. Though lending for housing and home improvement recently lost momentum (chart 21), it continued

to outpace general lending growth. In Austria the role of housing loans slightly increased over the past few years, although the share of housing loans to total loans is still below the European average. Likewise, the recent increase in residential property prices reflects also a catching-up process, as prices had been virtually flat since 2007 (for more details see the section Residential Property Prices Continue to Rise in this issue). Nevertheless, potential cyclical risks associated with a rapid price increase in the real estate sector cur-

Chart 21

Loan Growth in Austria

Q1 2007 = 100

Figures indicate moving average of annual growth rate

- ▬ Loans and advances to customers (nonbanks)
- ▬ Home and home improvement loans
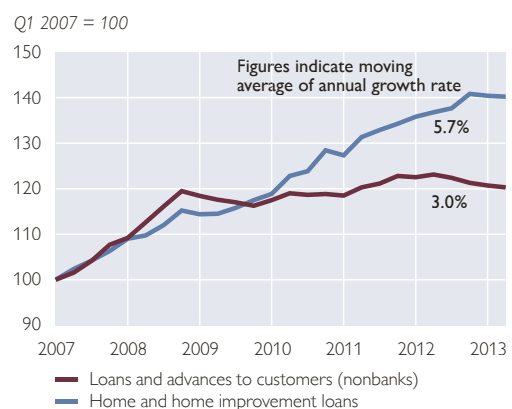
Source: OeNB.

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[10] *See also ECB (2013). Financial Stability Review. November.*

[11] *In contrast to the figures provided in the previous section on households and nonfinancial corporations, this figure also includes (negative) growth of credit to nonbank financial intermediaries and the Austrian government.*

rently warrant close monitoring by supervisory authorities.

Various supervisory measures targeting foreign currency lending in Austria have proved effective; the stock of outstanding foreign currency loans has been decreasing gradually. In foreign exchange-adjusted terms, foreign currency lending to Austrian households started to decline in October 2008, after authorities started to apply a stricter stance. As a result, until September 2013, foreign currency loans to households declined by 42% to EUR 29.5 billion. Other customers[12] owed an additional EUR 12.8 billion in foreign currency as at September 2013 (down from EUR 20.4 billion over the same time horizon).

Despite limited new foreign currency lending to Austrian borrowers, legacy assets will continue to pose a challenge to the Austrian banking system, in particular because 70% of foreign currency loans to households are bullet loans, more than 90% of which are linked to repayment vehicles. These instruments are exposed to financial market developments to a large extent, and therefore they also involve the danger of unexpected low yields, sometimes also a partial loss in principal. Strict compliance with foreign currency minimum lending standards will be an important element in containing the risk emanating from this type of lending.

The total loan volume of the CESEE subsidiaries of Austria's top 6 credit institutions decreased further (by 2.3% year on year in June 2013). At the same time loans denominated in foreign currency decreased more strongly, by 6.0% to EUR 79.1 billion (taking exchange rate effects into account). Overall, the aggregated share of foreign currency loans decreased from 46.0% to 44.3% year on year, with the euro still being the predominant foreign currency in CESEE.

The large Austrian banks reduced their leasing portfolio in CESEE by 2.1% to EUR 12.6 billion year on year in June 2013. The foreign currency-denominated leasing portfolio decreased over the same period by 3.4% to EUR 5.5 billion. The nonperforming leasing portfolio amounted to 24.8% of all leasing contracts in June 2013, down from 28.2% in June 2012. The credit quality of leasing contracts denominated in foreign currency is still lower than that of local currency leasing contracts, with an NPL ratio of 35.1% in June 2013 (44.5% in June 2012).

Austrian banks' exposure to CESEE has remained stable. Concerns about widespread deleveraging by Austrian banks in the CESEE region have not materialized, yet data indicate significant differences at the country level (chart 22). Since the height of the CESEE market turmoil in early 2009, Austrian banks' exposure to the region has increased by a cumulative 6% as reported or close to about 3% when adjusted for exchange rate effects. In countries in which banks are facing a difficult economic environment or a politically-induced tightening of bank regulation and taxation – e.g. in Ukraine, Kazakhstan and Hungary – the exposure shrank significantly.[13] This reduction was more than compensated for by an aggregate increase of almost 19% in other CESEE coun-

New lending in foreign currency in Austria is negligible…

… while foreign currency loans of Austrian banks' subsidiaries in CESEE start to decline

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[12] *Corporates, nonbank financial institutions and the public sector.*

[13] *The reduction in exposure to Kazakhstan was driven by the sale of a subsidiary at end-2012, which does not constitute deleveraging as it was a simple transfer of ownership.*

tries,[14] in particular Russia, the Czech Republic and Slovakia. The picture looks somewhat different when considering the foreign claims in the consolidated statistic of the BIS, because those figures are not adjusted for exchange rate effects. Furthermore, changes in banks' ownership can lead to shifts in volume, as recently happened in Austria, when Volksbank International sold most of its subsidiaries to Sberbank Europe.[15]

Significant Improvement in Bank Capitalization but Further Strengthening Required

In an environment of subdued profitability, euro area banks have continued

to strengthen their capitalization. These improvements have been achieved through a combination of capital increases, e.g. via rights issues and retaining earnings, and reductions in risk-weighted assets (RWA), which continued in the first half of 2013.[16]

The tier 1 ratio of the Austrian banking system continued to improve in early 2013. After its low in the second quarter of 2008, the aggregate tier 1 capital ratio (capital adequacy ratio) of all Austrian banks rose steadily and reached 11.5% (14.8%) by mid-2013. The increase of the aggregate tier 1 capital ratio can be mainly attributed to two effects:

First, the volume of eligible tier 1 capital has risen by more than EUR 22 billion[17] since 2008. Nearly EUR 9 billion of the increase in eligible tier 1 capital is currently attributable to government measures under the bank stabilization package,[18] with the rest reflecting private capital increases (private placements, capital injections from the parent group, retained earnings and other measures).

Second, in response to the financial crisis, banks reduced their RWA until the fourth quarter of 2009 (see chart 23), inter alia by streamlining their balance sheets and cutting off-balance sheet activities. While there was a slight increase in RWA in 2010, the trend of RWA reductions has continued ever since: RWA shrank by 3.2% in the first

Chart 22

Austrian Banks' Exposure to CESEE between 2009 and Q2 13[1]

Q1 2009 = 100
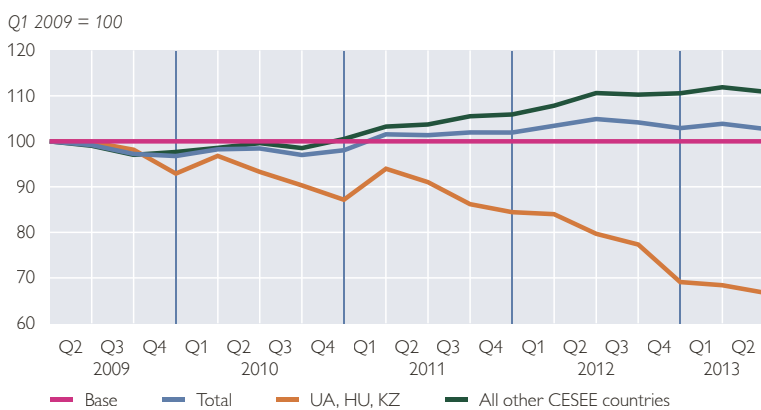
Source: OeNB.

[1] Adjusted for exchange rate effects.

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[14] *Of the countries with a substantial exposure of Austrian banks, reductions in reported (i.e. unadjusted) exposure since the first quarter of 2009 have been largest in Kazakhstan (due to the sale of operations), Ukraine (−34%) and Hungary (−13%), reflecting economic difficulties as well as elevated levels of political risk. By contrast, exposures to other countries grew substantially, with Poland (+113%), Russia (+34%), the Czech Republic (+23%), and Slovakia (+20%) featuring prominently.*

[15] *As Sberbank is Russian-owned, the exposure is not reported in the consolidated banking statistics for domestically-owned banks in Austria.*

[16] *See also ECB (2013). Financial Stability Review. November.*

[17] *This figure is based on data as at mid-2013 as more recent data were not available at the cutoff date.*

[18] *For further details on the current value of government measures see https://www.bmf.gv.at/finanzmarkt/finanzmarktstabilitaet/einzelinstitute.html (available in German only).*

Chart 23

Risk-Weighted Assets (RWA) of Austrian Banks

EUR billion · %

Legend:
- RWA (banking system)
- RWA (top 3 banks)
- Share of RWA in total assets (banking system)
- Share of RWA in total assets (top 3 banks)
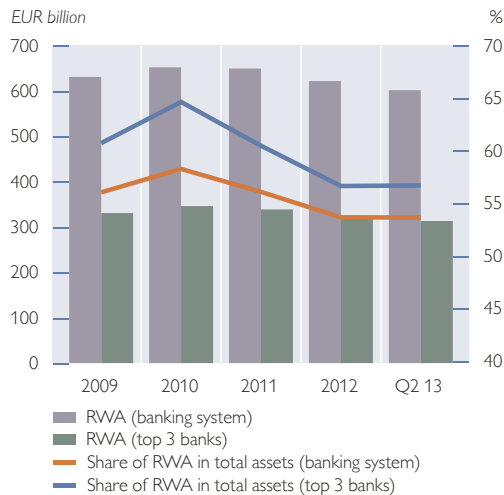
Source: OeNB.

Chart 24

Aggregate Tier 1 Ratio of Austrian Banks

%

Legend:
- 2nd quartile
- 3rd quartile
- Median
- Mean

Source: OeNB.

half of 2013, at the top 3 banks the decrease (–2.7%) was slightly lower than in the rest of the banking sector (–3.8%).[19]

The distribution of capital ratios among Austrian banks highlights the solid capitalization of small local banks compared to larger banks. At the end of the second quarter of 2013, the median tier 1 capital ratio of all Austrian banks stood at 14.8% and thus 3.2 percentage points above the aggregate mean (see chart 24). The higher median ratio essentially reflects the high number of local banks with above-average capitalization: Half of all Austrian banks (i.e. the second and third quartiles) post tier 1 capital ratios between 11.2% and 19.9%. But the chart also shows that the range is increasing over time, indicating a growing differentiation at those small banks.

Because of relatively high RWA compared to total assets, the leverage ratio of large Austrian banks is higher than that of their peer groups. For the top 3 banks the leverage ratio[20] was 6.5% in June 2013 compared to 4.1% for their European peers and 3.9% for their CESEE peers. A higher leverage ratio (reflecting lower leverage) is an important indicator of financial stability as it is (in contrast to RWA, which are calculated in different ways, as a recent analysis by the BIS shows[21]) independent of banks' internal models and/or changes in external ratings.

At the same time, despite recent improvements, Austrian banks are still facing challenges in strengthening their capital base. Even though the top 3 banks have improved their tier 1 capital ratios in recent years, the gap between them and

Gap in capitalization compared with European and CESEE peers

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[19] This RWA reduction is partly driven by the merger of a former Austrian bank with its foreign parent, which contributed approximately 50 basis points.

[20] The leverage ratio is defined as tier 1 capital over total assets.

[21] See BIS (2013). Analysis of risk-weighted assets for credit risk in the banking book. July.

Chart 25

Tier 1 Ratio of Large Austrian Banks Compared with European Peers

Source: OeNB, Bankscope.

their peers even widened.[22] In addition to the need to replace state participation capital (so far one major bank has paid back state capital, another has begun to do so), this underpins the need for further action by Austrian banks.

Analysts and rating agencies have also pointed out the below-average capitalization of internationally active Austrian banks, considering it as one of their key weaknesses, although clear improvements have been noted since 2007. The stability of the Austrian banking system is supported by a generally sound business model (retail banking) and a solid liquidity position. In addition, improvements have been acknowledged as regards the reduced volumes of foreign currency loans in Austria. For these reasons, Standard and Poor's, for example, assigns the Austrian banking system to the second best group (out of ten). However, a higher capitalization of Austrian banks

is warranted as banks' ratings currently benefit from comparatively high government support. The role of government support in banks' ratings is widely expected to diminish against the background of a European resolution regime, which provides another reason why banks should make the necessary moves toward increasing their capitalization further. This assessment by external institutions confirms the findings and recommendations of the OeNB.

Financial market conditions have remained positive, although volatility increased somewhat. Equity prices of listed Austrian financial institutions have underperformed their European peers since the beginning of 2013. While price-to-book ratios of European banks recovered further and reached a level of approximately 0.9, the related ratios of Austrian banks remained unchanged or even declined. The slower performance can also be attributed to their capital positions and concerns about potential dilutions due to capital increases as well as to continuously high NPL levels in the CESEE region.

Liquidity Situation of Austrian Banks Remains Stable but Challenging

On the European level, the liquidity and funding situation of banks has remained calm for the past six months, yet vulnerabilities persist. Debt issuances remained at a low level throughout the first three quarters of 2013 compared to 2012. Nevertheless, market conditions have improved on average for European banks, as has been reflected by reduced volatilities in funding markets, narrowing spreads and a stable three-month EONIA swap rate since the beginning of 2013. Net issu-

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[22] *The two peer groups analyzed here consist of, first, 12 European banks with relevant CESEE exposure and, second, of 31 European banks with similar business models.*

Chart 26

Liquidity of the Austrian Banking System

Cumulated Net Funding Gap

October 2012 = 100

Cumulated Counterbalancing Capacity

October 2012 = 100
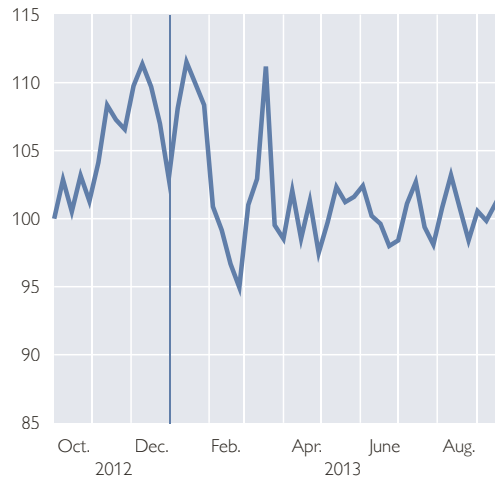
Source: OeNB.

ance of unsecured debt remained negative for European banks in 2013, which could point toward a trend of banks decreasing their liquidity buffers to increase profitability.[23]

The ongoing bail-in discussion will most likely affect the pricing and availability of bank funding in the medium term and could lead to increasing disintermediation, since larger nonfinancial corporations could become incentivized to tap debt markets themselves. While banks – mainly from euro area core countries – made use of the early repayment option of the two longer-term refinancing operations (LTRO) due to cost benefits in the money market, banks – especially those in the European periphery – still rely on central bank liquidity.

Austrian banks have reduced their participation in ECB open market operations considerably, by more than 65% since the beginning of 2013 compared to year-end. The actual total volume of the allotments to Austrian banks equals 0.7% of the ECB total, well below the proportional share of Austrian banks in the Eurosystem (3.8% measured by total assets).

The liquidity buffer of Austrian banks has remained stable for the last six months (chart 26), while the cumulated net funding gap of the 29 largest Austrian banks (maturities up to 12 months without money market operations) decreased since then from EUR 41 billion to EUR 34 billion until the end of September 2013. Due to changes in the reporting regime in February 2013, the level of the current figures is somewhat higher than a year ago. Adjusted for those changes, the most recent value is nevertheless only slightly above the long-term average. The net position of planned debt issuances to repayable debt has continued to improve moderately, while the counterbalancing capacity remained stable at EUR 99 billion.

Money markets' cost benefits foster early LTRO repayment

[23] See also ECB (2013). Financial Stability Review. November.

Turning to foreign currency funding, banks continued to narrow their liquidity gaps in U.S. dollar and Swiss franc funding. However, some banks still rely heavily on short-term foreign currency swaps to fund their foreign currency operations and also hold low levels of liquidity buffers denominated in U.S. dollars and Swiss francs, which lowers their stress resilience. Therefore, banks should continue their efforts to reduce their U.S. dollar and Swiss franc positions, diversify their funding sources and strengthen their liquidity buffers in these currencies.

The Austrian banking system has traditionally featured a very stable liquidity position, as deposits play an important role in funding. Austrian households hold roughly 50% of their financial wealth as bank deposits, much more than their peers in the U.S.A., the U.K. and the euro area, which contrib-

utes to a stable refinancing source. While the deposits of domestic customers increased by EUR 0.8 billion in Austria as at June 2013 year on year, foreign customers reduced their deposits by EUR 2.4 billion due to expectations of persistently low interest rates. As a result, customer deposits at Austrian banks totaled EUR 358 billion, down EUR 1.6 billion compared to mid-2012.

Similar to developments in Austria, deposit growth at Austrian subsidiaries in CESEE was negative over the past few quarters up to June 2013. Therefore the funding gap (as indicated in chart 27) turned positive again. The decline became especially apparent in the decrease in retail deposits in the Czech Republic, Poland and some Western Balkan countries.

The recent financial crisis has shown that banks with limited local funding sources were significantly more likely to suffer higher loan losses than others. In 2012, the OeNB and the FMA published a "sustainability package"[24] (geared in particular to subsidiaries of the top 3 Austrian banking groups) stipulating that banks with loan-to-local stable funding ratios[25] (LLSFRs) of above 110% are considered "exposed." Since then, the sustainability of banks' new business has been monitored more closely than ever. Besides, a special focus has been put on the risk-adequate pricing of intragroup liquidity transfers. The results of these processes are updated quarterly, and while the focus is clearly on year-end data, interim analyses provide insights on emerging trends. The results are regularly shared

Decline in customer deposits in Austria driven by foreign depositors

Monitoring the sustainability of (selected) foreign subsidiaries shows that …

Chart 27

Customer Funding Gaps at CESEE Subsidiaries of Austrian Banks

EUR billion   %

Total (left-hand scale)
% of customer loans (right-hand scale)
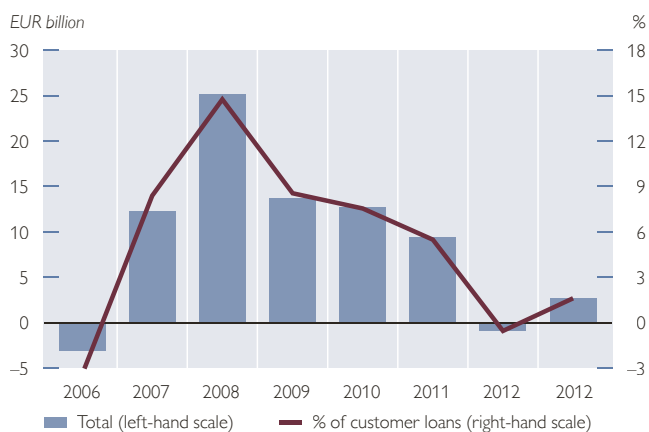
Source: OeNB.

[24] *FMA and OeNB (2012). Supervisory guidance on the strengthening of the sustainability of the business models of large internationally active Austrian banks.*

[25] *The definition of the LLSFR and its components (in the stock) is: volume of loans to nonbanks after provisioning divided by the local stable funding (i.e. deposits from nonbanks + supranational funding + capital from third parties + the total outstanding volume of debt securities with original maturities of one year or more issued by the subsidiary to investors outside their consolidated group).*

and discussed with the banks concerned and their host and home supervisors.

The latest available data are from June 2013, when three quarters of the monitored subsidiaries were considered to be not exposed, since their stock LLSFRs were below 110%; only two exposed subsidiaries were found to also exhibit an unsustainable trend in their new (year-on-year) business. Again it should be noted that the focus is on year-end data; intra-year data are being used for steering measures.

Intragroup liquidity transfers to all CESEE subsidiaries have substantially declined (from EUR 40 billion in mid-2012 to EUR 29 billion in June 2013). The average LLSFR for the sample of monitored subsidiaries remained broadly flat at around 90% in the first half of 2013.

… only two have an unsustainable business model.

Key Recommendations of the Austria Financial Sector Assessment Program (FSAP) 2013

The Austrian financial system and supervisory practices underwent a comprehensive assessment by the International Monetary Fund (IMF) during 2013 in the context of the Financial Sector Assessment Program (FSAP). The findings are summarized in the Financial Sector Stability Assessment (FSSA), which – together with the results of the 2013 Article IV Consultation – was published by the IMF in September 2013.[1] This box gives an overview of the key results and recommendations regarding the three core elements of the FSAP: (1) financial stability assessment, (2) financial sector oversight and (3) crisis prevention and management.

The IMF mission team first evaluated the source, probability and potential impact of the main risks to macrofinancial stability in Austria in the near term. The risk assessment included various stress tests for the Austrian banking system (solvency, liquidity, contagion), whose results were summarized in the Financial Stability Report 25, published in June 2013, and in the FSSA. More information on the stress testing methodology can be found in the special issues section of this issue.[2] The overall risk assessment of the IMF is broadly in line with the results the OeNB derives from its continuous monitoring and assessment of systemic risk. The key recommendation of the IMF concerns a further strengthening of banks' capital buffers, which echoes the stance of the OeNB published in its recent Financial Stability Reports.

The assessment of financial sector oversight in Austria, the second core element of the FSAP, mainly covered the areas of banking, insurance and macroprudential supervision. As in most FSAPs around the world, the regulatory framework and supervisory practices with respect to the banking sector were assessed by analyzing their compliance with the Basel Core Principles (BCP) of Effective Banking Supervision (the revised version of September 2012 was applied for Austria). The key recommendations from the BCP assessment regard further improvements in the "ladder" of supervisory responses, from corrective action to recovery and resolution planning, and in the governance of the FMA. Another area for improvement that was identified is risk management and corporate governance practices in small and medium-size banks. Overall, many of the recommendations for banking supervision require changes in legislation, i.e. action by the relevant executive and legislative bodies.

As regards macroprudential supervision, the IMF recommendation to set up a macroprudential authority with a clear legal mandate for policy formulation and rule-making is broadly but not fully met by the forthcoming establishment of the Financial Market Stability Board starting in January 2014.[3]

[1] *http://www.oenb.at/de/presse_pub/aussendungen/IMF_AIV/uebersicht_imf.jsp*
[2] *Feldkircher et al. 2013. ARNIE in Action: The 2013 FSAP Stress Tests for the Austrian Banking System.*
[3] *See also Liebeg, D. and A. Trachta. 2013. Macroprudential Policy: A Complementing Pillar in Prudential Supervision – The EU and Austrian Frameworks, in this issue.*

In addition to the assessment of financial stability risks and the adequacy of the supervisory framework, the FSAP also evaluated authorities' capacity to manage and resolve a financial crisis, should the risks materialize. This third element of the FSAP also included an evaluation of the financial safety net, in particular deposit insurance but also bank resolution and the lender of last resort function. The two key recommendations here are to establish a legal framework for orderly bank resolution and to reform the Austrian deposit guarantee system with the aim of creating a single ex-ante funded system with risk-based contributions. To operationalize the latter, the IMF recommends the creation of a high-level working group to prepare a suitable reform proposal for the Austrian deposit guarantee system together with the Ministry of Finance and other stakeholders as soon as possible. While the working group should be guided by the FSAP recommendation, it may be useful to also take into consideration forthcoming changes with respect to bank resolution and possibly also the existing Austrian bank levy.

The OeNB welcomes the comprehensive assessment of the Austrian financial system and supervisory structure. The Austrian parliament and other policymakers would be well advised to take the IMF recommendations into consideration when setting the regulatory and supervisory reform agenda in order to ensure financial stability in Austria while limiting the need to use public funds in the future.

New Payment Services Directive to enhance security and authentication

New Oversight Requirements for Payment Systems

The Eurosystem-wide harmonization of oversight activities has made further progress in financial market infrastructures (i.e. payment and securities settlement systems, central counterparties and trade repositories). After including the "CPSS-IOSCO Principles for Financial Market Infrastructures" (PFMIs) in the oversight framework of the Eurosystem, the ECB decided to implement the PFMIs by means of a regulation, which is to cover both large-value and retail payment systems of systemic importance. It will replace the "Core Principles for Systemically Important Payment Systems" introduced by the ECB in 2001.

Furthermore, the preparations for the cooperative oversight framework of TARGET2-Securities (T2S) are well underway in order to promote the safety and efficiency of payment systems. The ECB will act as lead overseer of T2S and will closely cooperate with the competent overseers and supervisors of the participating central securities depositories.

SEPA migration soon to be finalized

Turning to retail payments, in July 2013 the European Commission published a proposal for a revised Payment Services Directive ("PSD2"), which will also cover third-party service providers offering online banking-based payment initiation ("payment initiation services"). Furthermore, the PSD2 will contain enhanced security and authentication requirements for payment services providers, which rely on the "Recommendations for the security of internet payments" released by the European Forum on the Security of Retail Payments (a voluntary cooperative initiative between overseers of payment services providers and overseers from the European Economic Area) and approved by the Governing Council of the ECB in January 2013. The core objective of the recommendations is to ensure that the initiation of internet payments as well as access to sensitive payment data should be protected by strong customer authentication so that only the rightful user can initiate a payment.

The deadline for the mandatory conversion to the SEPA payment instruments is rapidly getting closer. As of February 1,

2014, the national credit transfer and direct debit schemes of the euro area countries will have to be replaced by SEPA Credit Transfer (SCT) and SEPA Direct Debit (SDD). The OeNB has cooperated closely with the relevant stakeholders in order to ensure a smooth and timely SEPA-transition in Austria.

Box 5

Crisis Planning and Early Intervention Regime for Credit Institutions in Austria

In July 2013, the Austrian Banking Intervention and Restructuring Act (BIRG), amendments to the Austrian Banking Act and the Financial Market Authority Act were adopted. As credit institutions have to prepare recovery and resolution plans, the general purpose of the new laws is to establish a regime for crisis prevention, planning and early intervention at credit institutions. Furthermore, certain early intervention tools are introduced, which the Financial Market Authority (FMA) can use if specified indicators fall below certain thresholds.

The main objective of the new framework is to prevent credit institutions from becoming distressed and, hence, to reduce the likelihood that public funds are used to bail out credit institutions. The law is based on the European Commission's proposal for a directive on the recovery and resolution of credit institutions and investment firms (the BRRD). However, the Austrian framework does not provide for resolution instruments as proposed in the BRRD. These instruments will be introduced with the transposition of the BRRD into national law.

In order to prepare for crisis scenarios, credit institutions are to establish recovery and resolution plans. Recovery plans must describe the measures a credit institution intends to take in the event of a significant deterioration in its financial situation. Resolution plans are to demonstrate how a credit institution can be wound down or reorganized. The FMA assesses both the recovery and resolution plans and may require amendments if deemed necessary. The FMA seeks the expert opinion of the OeNB as to whether the legal requirements for recovery and resolution plans as defined in the law are met.

The FMA may exempt credit institutions from certain requirements or reduce the level of detail required, if the nature of activities of the credit institution, its size and interconnectedness with other financial market participants allow such an exemption. A full exemption from preparing recovery and resolution plans may be granted if, in the event of that credit institution's insolvency, there are no concerns that this would have any material adverse impact on the financial markets, on other credit institutions or on funding conditions.

As a supplementary feature to strengthen the preventive powers of the FMA, additional tools for taking early intervention measures are introduced: If a credit institution fails to comply with capital or liquidity requirements under the Capital Requirements Regulation or is at risk of violating these requirements, the FMA will take early intervention measures as set out in the Austrian Banking Act. The FMA may order the OeNB to carry out an on-site inspection in order to determine whether the prerequisites for early intervention are met. To this end, the OeNB has to issue an expert opinion.

Insurance Companies and Pension Funds Overall Resilient but Challenged by Low Interest Rate Environment

Favorable market conditions led to a better performance of Austrian mutual funds (4.9% year on year), pension funds (6.2% year on year) and insurance companies (4.3% year on year) in the first half of 2013 compared to 2012.

However, the negative quarterly performance of mutual funds (–1.7%) and pension funds (–1.3%) in the second quarter of 2013 indicates that conditions can change quickly and that the capital gains registered with bonds during a period of falling or compressed yields can prove volatile in the current market environment.

The persistent low-yield environment poses a challenge to traditional life insurers' and pension funds' products with long-term minimum interest guarantees, as reinvestments can only be undertaken at comparatively low yields. Insurers and supervisors in Europe have already responded to the risk of a prolonged period of low interest rates. Some companies have started to shift from fixed and/or long-term guarantees to unit-linked life insurances, transferring the investment risk to the policyholder. The European Insurance and Occupational Pensions Authority (EIOPA) has published an opinion outlining a coordinated supervisory approach to this issue and the FMA continues to cooperate with firms identifying their specific vulnerabilities. The return on investments in the Austrian life insurance business was stable at around 4% (year on year) during the first half of 2013 and covers the guaranteed interest rate, which lies slightly below 3% for the stock and 1.75% for new business.

Preparations for Solvency II are underway

The life insurance business suffered from a weak macroeconomic environment, from a change in taxation and the competition from other saving products. Nevertheless, after nine consecutive quarters of decreasing premia, nominal premium growth of 1.4% in the first half of 2013 was a positive sign.

A number of natural disasters led to a decline in the underwriting results of property and casualty insurers in early 2013. Premium income increased slightly by 1.7%. The combined ratio for property and casualty insurance was 94% and thus below the critical value of 100%.[26] Health insurance premium income posted average premium growth of about 3.7% and return on investment of 3%.

Contagion risk of insurance companies is mainly driven by their exposure to banks and sovereigns. By June 2013, insurance companies had invested EUR 31.6 billion in bank securities (40% of their total securities investment) and EUR 20 billion in sovereign bonds.

EIOPA has published a guideline for an interim regime that should prepare the industry for Solvency II. The focus was put on the governance system, a forward-looking assessment of undertakings' own risk, the submission of information and the pre-application for internal models. The implementation in Austria will take place by an amendment of the Insurance Contract Act, which is expected to be enacted in mid-2014.

Pension funds in Austria continued to grow in the first half of 2013. However, the second quarter of 2013 showed a decline compared to the previous quarter, and further reductions of company pensions or supplementary payment obligations for companies with guaranteed pension plans might be possible. Pension funds invest more than 90% of their assets indirectly via mutual funds, the lion's share of which (EUR 5.6 billion) are foreign mutual funds (44% Luxembourg, 19% German, 18% Irish). EUR 4 billion are invested in sovereign debt, EUR 2.3 billion in corporate securities and EUR 1.6 billion in bank securities.[27]

Net asset value of mutual funds increased steadily, but the pre-crisis level has not been reached yet. In June 2013, the net asset value of mutual funds in Austria stood at EUR 148 billion – 5.8% higher than a year before. Nevertheless, there is still a notable gap to the all-time high of EUR 170 billion (in early 2007). The overall performance in June 2013 was 4.9% (year on year), mainly driven by

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[26] *A combined ratio of 100% indicates a balance between premium income and the sum of loss and expense ratio.*

[27] *Source: OeNB securities statistics.*

the performance of equity funds of more than 10%. However, the performance in the second quarter of 2013 was negative.

In July 2013, the Austrian Alternative Investment Fund Managers Act (AIFM Act), transposing the AIFM Directive into Austrian law, entered into force. Addressing certain shortcomings in the European regulatory framework, the AIFM Directive covers institutional funds, hedge funds, real estate funds and private equity funds. In particular leveraged alternative investment funds will be analyzed from a financial stability perspective. In this respect, the OeNB will be responsible for identifying systemic risks to financial stability. In case of financial stability concerns, the OeNB is required to inform the FMA, which may impose limits to the level of leverage or other restrictions on AIF managers. In Austria, the share of specialized funds (open to institutional investors) continued to grow over the past 12 months and accounts for about 43% of the total net asset value of EUR 148 billion.

Alternative Investment Fund Managers Directive provides for changes in the regulatory framework

Special Topics

Macroprudential Policy: A Complementing Pillar in Prudential Supervision – The EU and Austrian Frameworks

David Liebeg,
Alexander Trachta[1]

There have been remarkable developments in the field of macroprudential supervision in the European Union (EU) and Austria since the onset of the financial crisis: The European Systemic Risk Board (ESRB) has established itself as an important shaper of macroprudential policy in the EU. In response to one of the ESRB's recommendations, the vast majority of EU Member States have set up, or are about to set up, national macroprudential authorities. The newly introduced EU banking legislation explicitly provides supervisors with prudential instruments designed to address systemic risks. In Austria, as of 2014 the Financial Market Stability Board (FMSB) will be the central body for the coordination of macroprudential policy. The legal mandate of the Oesterreichische Nationalbank (OeNB) was amended to include various new macroprudential tasks for the supervision of banks, in particular, but also regarding systemic risks associated with the use of leverage by alternative investment funds. In its capacity as either competent or designated authority, the Financial Market Authority (FMA) is the prudential authority in charge of implementing macroprudential policies.
The challenges ahead – besides methodological issues not addressed in this paper – include (1) ensuring the effectiveness of the new institutional arrangements in overcoming the inaction bias inherent in macroprudential policy, (2) managing the notification and approval requirements in the area of macroprudential instruments as set out in EU banking law, and (3) coordinating cross-border effects of national macroprudential policies.

Since the more fundamental macroprudential policy issues were discussed in Financial Stability Report 21 (Liebeg and Posch, 2011), considerable progress has been made in establishing a framework for macroprudential measures in the EU and Austria alike. This paper describes this new framework as well as its key players and their mandates, and concludes with an outlook on the challenges ahead.

Macroprudential policy aims at modifying the key prudential parameters, such as capital, liquidity or concentration risk requirements, to reflect the changes in the systemic risk environment related inter alia to the macroeconomy, the financial system or individual institutions in a forward-looking manner, taking into account both the time-varying and the structural dimension of systemic risk.

1 ESRB Makes Important Contribution to the EU Supervisory Landscape

Since its establishment in 2011, the European Systemic Risk Board (ESRB) has issued six recommendations on financial stability issues, which are governed by an "act or explain" mechanism, i.e. addressees – national supervisors and EU governments as well as the European Commission and the European System of Financial Supervisors (ESFS) – are either to implement

these recommendations or offer an appropriate justification in case of inaction. In doing so, the ESRB takes a comprehensive approach with a focus that goes beyond the banking sector. Four of the six ESRB recommendations address systemic risks: the recommendations on foreign currency lending (ESRB, 2011a), U.S. dollar-denominated funding (ESRB, 2011b), money market funds (ESRB, 2012a) and the funding of credit institutions (ESRB, 2012b).

Besides addressing systemic risks, the ESRB also aimed to improve the macroprudential oversight framework in the EU by issuing a recommendation on the macroprudential mandate of national authorities in 2011 (ESRB, 2011c) and a recommendation on intermediate objectives and instruments of macroprudential policy in 2013 (ESRB, 2013). The former recommendation, which addressees had to comply with by June 2013, advised EU Member States to establish national macroprudential authorities with a specific mandate to contribute to financial stability in the respective Member State. Most EU countries have established such a body or have expressed the intention of doing so. However, the concrete institutional arrangements vary across countries. In some cases the national central banks have a leading role (as envisaged by the recommendation), whereas in other cases the ministries of finance play a more prominent part in the macroprudential body. The latter recommendation (ESRB, 2013) builds on the former and, by proposing intermediate objectives for macroprudential policy and appropriate instruments to address them, provides guidance on how to operationalize the macroprudential man-

dates. Finally, in the course of 2013, the ESRB has worked on making the macroprudential instruments proposed in its latest recommendation operable.

2 Macroprudential Tools Provided by the New EU Banking Legislation

The new European banking legislation, i.e. Directive 2013/36/EU[2] (Capital Requirements Directive IV – CRD IV) and Regulation (EU) No 575/2013[3] (Capital Requirements Regulation – CRR), acknowledges that in safeguarding financial stability, macroprudential policy is a necessary complement to traditional microprudential supervision. It also recognizes that systemic risks may differ across EU Member States, reflecting for example differences in the structure and size of the banking sector compared to the wider economy and the credit cycle, and that it is, therefore, essential for national authorities to be able to address such national specificities effectively. For this reason, the new legislation on the one hand establishes uniform microprudential rules ("a single rule book") for the institutions covered and on the other hand affords national authorities a leading role – and some degree of flexibility – in respect of their macroprudential policies. This approach correctly reflects the different sources and the complex nature of systemic risk as well as the expertise and responsibilities of prudential authorities in relation to financial stability at the national level. This is designed to foster both financial stability in the EU and the smooth functioning of the internal market.

The new EU banking legislation provides banking supervisors with a

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[2] *Official Journal (OJ) L 176, 27.6.2013, p. 338.*

[3] *OJ L 176, 27.6.2013, p. 1.*

number of legally binding instruments designed to address different dimensions of systemic risk to financial stability. Within the CRD framework, supervisory authorities will have a combined buffer requirement at hand, including a countercyclical capital buffer, a buffer for systemically important institutions and a systemic risk buffer. This macroprudential buffer regime allows for an adaptation of banks' capital base in response to developments in the financial system or the macroeconomy. It also provides for a differentiated approach to addressing the two main dimensions of systemic risk, the time dimension and the cross-sectional dimension. For instance, the countercyclical capital buffer should be built up when aggregate growth in credit and other asset classes is judged to be associated with a build-up of system-wide risk, taking into account the ratio of credit to GDP in individual Member States, and can be reduced during periods of stress. However, the buffers designed for systemically important institutions and against overall systemic risks can be used as a measure against more structural risks to financial stability. In addition, the overhaul of the pillar 2 framework and the regime of supervisory power will enable the competent authorities to take the assessment of systemic risk into account in prudential supervision.

Laying down uniform rules concerning prudential requirements for banks, the CRR also includes discretionary elements that can be used by the authorities to tackle specific systemic risks. This applies particularly to financial stability concerns regarding mortgage exposures. Supervisors can respond to risks from real estate markets by adapting risk weights and exposure-

weighted average loss-given-default values accordingly.

If none of these measures are deemed to be adequate for addressing the identified systemic risks, authorities can adopt additional macroprudential measures in the context of several harmonized prudential requirements, including the level of own funds, sectoral capital requirements, liquidity requirements and the rules concerning large exposures and public disclosure. However, this additional flexibility is available only for a limited period of time and subject to procedural controls involving European institutions and bodies, including the European Commission and the Council, in order to safeguard the internal market. The macroprudential framework of EU banking legislation includes rules on the mutual recognition of national macroprudential policies.

3 The Single Supervisory Mechanism: An Additional Institutional Layer in the Macroprudential Policy Framework

The implementation of the single supervisory mechanism (SSM), which grants the European Central Bank (ECB) supervisory powers over banks in the euro area and in opt-in Member States, adds an institutional feature to the macroprudential policy framework. While macroprudential policy remains primarily the competence of Member States – thereby honoring the fact that national financial cycles may vary between countries – the SSM Regulation[4] also provides the ECB with certain competences in the field of macroprudential supervision: If deemed necessary, the ECB may – within the scope of the SSM and instead of the national

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[4] *OJ L 287, 29.10.2013, p. 63.*

authorities – impose higher capital buffer requirements or apply other stricter measures aimed at addressing systemic risks at the level of credit institutions in the cases specifically set out in EU banking legislation. For the purposes of SSM banking supervision, the ECB is deemed to be the respective competent or designated national authority. In this way, there is an extra layer of protection against a potential "bias towards inaction" (ESRB, 2011c) in macroprudential supervision. The ECB and the national authorities are obliged to cooperate closely and to mutually notify each other at least ten days in advance of any decisions regarding the use of macroprudential policies.

4 A Macroprudential Perspective to AIFM Oversight

The European Alternative Investment Fund Managers (AIFM) Directive[5] came into force in mid-2011. The Directive was transposed into Austrian law through the Alternatives Investmentfonds Manager-Gesetz (AIFMG)[6], which entered into force on July 22, 2013. It is comprehensive in scope, covering all managers of funds that are not subject to the Units for Collective Investment in Transferable Securities (UCITS) Directive. This includes inter alia managers of hedge funds, private equity funds and closed-end funds. The AIFM Directive is designed to improve supervision of the shadow banking sector in Europe. The introduction of comprehensive reporting requirements for such fund managers made extensive supervisory data on non-UCITS funds and their managers available to supervisors for the first time. If deemed necessary from a financial stability per-

spective, supervisors may also require supplementary information. Article 25 of the AIFM Directive introduces a macroprudential perspective to securities supervision: Supervisory authorities are required to use supervisory data for assessing whether the use of leverage by AIFMs contributes to the build-up of systemic risk in the financial system, risks of disorderly markets or risks to long-term economic growth. Furthermore, the authorities have to assess whether AIFMs or their funds potentially constitute an important source of counterparty risk to a credit institution or other systemically relevant institution in another Member State. Article 23 AIFMG mandates the OeNB to conduct analyses of the respective systemic risks to financial stability. Any financial stability concerns identified by the OeNB must be reported to the FMA, which, as competent authority, may impose limits on the level of leverage allowed to AIFMs or issue other restrictions.

5 The Newly Established Austrian Financial Market Stability Board

In compliance with the ESRB recommendation on national macroprudential mandates, the Austrian legislator has established the Financial Market Stability Board (FMSB, Finanzmarktstabilitätsgremium). Article 13 of the "Finanzmarktaufsichtbehörden-Gesetz" (FMABG)[7] lays down the mandate and composition of the FMSB, which will take up operations in 2014. The FMSB's tasks will be strengthening financial stability, mitigating the risks of systemically important financial institutions and addressing the structural and cyclical aspects

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[5] *OJ L 174, 1.7.2011, p. 1.*

[6] *Federal Law Gazette I No. 135/2013.*

[7] *Federal Law Gazette I No. 184/2013, Article 7.*

of systemic risk. The FMSB consists of six members: two representatives of the Federal Ministry of Finance, which also chairs the board, two representatives of the newly established Fiscal Advisory Council and one each of the FMA and the OeNB.

Mimicking the "act or explain" framework of the ESRB, the Austrian setting provides for instruments in the form of recommendations the FMSB may address to the FMA, which will either implement them or explain non-action or any other deviation from the FMSB's recommendations. According to the revised Austrian Banking Act[8], the FMA is the designated authority for macroprudential instruments for which CRD IV or CRR require such a designation (i.e. capital conservation buffer, countercyclical capital buffer, buffers for Global Systemically Important Institutions (G-SII) and Other Systemically Important Institutions (O-SII), systemic risk buffer and the instruments of Article 458 CRR[9]). These instruments are implemented by the FMA through administrative regulations ("Verordnungen"), with the exception of the G-SII and O-SII buffers, which are implemented by individual decisions ("Bescheide"). In all cases, the FMA has to obtain the approval of the Federal Ministry of Finance as a final condition before enacting such legal acts.

Besides its representation in the FMSB, the OeNB, according to Article 44c of the amended Federal Act on the Oesterreichische Nationalbank (Nationalbank Act)[10], plays an important role in contributing to macroprudential policy in Austria. The legal mandate of the OeNB comprises identifying systemic risks, informing the FMSB of its findings, proposing recommendations and risk warnings the FMSB may then issue to the FMA, assessing the implementation of the FMSB's recommendations and preparing an annual report on the systemic risk situation in Austria for the FMSB's annual report to Parliament and the Federal Ministry of Finance. Finally, the FMSB will be administered by a secretariat established at the OeNB.

6 Conclusions

While the macroprudential policy framework in the EU and Austria now rests on a more solid footing than before, there is still the challenge of addressing specific systemic risks to financial stability using concrete macroprudential policy measures that are effective, efficient and proportional, yet timely. These challenges can (roughly) be attributed to two spheres: the methodological and the institutional sphere.

The methodological issues – which are not the main focus of this paper – center on identifying appropriate indicators that give early warning signals ahead of a looming crisis, designing appropriate tools for addressing the risks identified and getting a grip on the intended and unintended consequences of these instruments.

When it comes to the institutional aspects of macroprudential policy, there are three main types of challenges:

First, the institutional arrangements setting up the macroprudential frame-

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[8] *Federal Law Gazette I No. 184/2013, Article 2.*

[9] *The instruments of Article 458 CRR consist of amendments to the level of own funds, requirements targeting large exposures, public disclosure requirements, level of the capital conservation buffer, liquidity requirements, risk weights for targeting asset bubbles in the residential and commercial property sector or intrafinancial sector exposures as regulated in CRR.*

[10] *Federal Law Gazette I No. 135/2013.*

work in response to the ESRB recommendation will have to prove that they are effective in coordinating macroprudential policies to address systemic risks and in overcoming the potential bias toward inaction inherent in the macroprudential policy setting, which is typically accompanied by visible short-term costs but invisible longer-term benefits. Furthermore, the successful development and implementation of macroprudential policies requires intensive and transparent cooperation and interaction between the micro- and macroprudential perspectives of supervision.

Second, the measures provided by the new EU banking legislation are subject to (varying) notification and approval requirements by the EU institutions (e.g. the European Banking Authority, the ESRB, the European Commission, the EU Council and the European Parliament). Some of these coordination procedures at EU level are rather burdensome and could, thus, induce a certain level of inaction bias or result in the use of second-best solutions in macroprudential policy.

Third, cross-border considerations have to be taken into account as some measures may have spillover effects, e.g. in cases in which banking systems are dominated by foreign owners (the host country may be affected by measures taken in the home country) or in which banks have considerable foreign operations (the home country being affected by measures taken in host countries). While the EU framework provides for coordinative platforms between the different EU Member States, coordination with non-EU countries will need to rest on informal agreements. In this respect, the Vienna 2.0 Initiative could provide for an adequate platform if set up properly.

Another aspect shaping macroprudential policy in the euro area is the newly introduced SSM that establishes the ECB, together with the respective national authorities, as banking supervisor with both micro- and macroprudential competencies. Here, the overlaps and complements of the ESRB, the ECB and national authorities will yet have to be worked out.

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Quantifying Financial Stability in Austria – New Tools for Macroprudential Supervision

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This paper's objective is to contribute to the evolving field of macroprudential supervision in Austria in a twofold way: First, we construct an Austrian financial stress index (AFSI) that quantifies the level of stress in the Austrian financial market. Second, drawing on supervisory, market-based and macroeconomic data for the period from 2000 to 2012, we examine various indicators regarding their predictive power for this stress index. These indicators are categorized to cover the following six risk channels that affect financial stability: risk-bearing capacity, mispricing of risk, excessive growth, interconnectedness, concentration, and the macroeconomic environment and its outlook. In our empirical analysis we apply state-of-the-art econometrics including best subset selection, Kalman filters and model averaging. Our results indicate that, as risk channels, excessive growth, interconnectedness and mispricing of risk have the greatest influence on the AFSI. Furthermore, our findings lead to the conclusion that the complexities of risk channel interactions render univariate analysis and/or stand-alone models ineffective for financial stability-oriented policymaking. Instead, an integrated analysis of different indicators turns out to be the more promising approach when trying to identify the buildup of systemic risk.

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With the global financial crisis, macroprudential supervisors have intensified their efforts to identify systemic vulnerabilities and to predict financial instability. Detecting early warning signs in the financial system, such as price bubbles or a high degree of interdependency, is essential to avoid further crises and the resulting huge welfare losses. The excessive rise of property prices (to the extent of property price bubbles) in the United States and beyond as well as certain risks amplified by market participants' increasing interconnectedness show that early warning signals had already been present before the current crisis emerged. In the wake of the current crisis, the number of contributions to the literature on systemic risk has recently increased significantly, covering topics from predicting systemic risk events (e.g. Lo Duca and Peltonen, 2011; Arsov et al., 2013; Blancher et al., 2013) to policy instruments mitigating the buildup of financial instability (e.g. Lim et al., 2011; CGFS, 2012).

This paper contributes to the growing body of literature in an empirical manner. First, we support macroprudential supervision in Austria by constructing a composite financial stress index that quantifies the current strength of Austrian financial stability – the Austrian financial stress index (AFSI). Second, we develop a model to predict financial distress by examining several indicators with respect to their early warning capability, as measured by their power to forecast the AFSI. In this way, this paper helps identify future financial stability risks and, in doing so, contributes to fulfilling the forthcoming responsibilities of macroprudential supervision.[2]

Holló et al. (2012) and Jakubík and Slačík (2013) provide recent examples of how to construct composite financial stress indices by using various subindices. For early warning models, the empirical literature follows multiple approaches. We classify these as follows: (1) the signal extraction approach, (2) the probabilistic approach and (3) the index-based approach.

The signal extraction approach (1) was made popular by Kaminsky and Reinhart (1999), who follow this approach to analyze twin crises – the links between banking and currency crises. They define a banking crisis by the emergence of bank runs that lead to the closure, merging or takeover by the public sector of one or more financial institutions. If there are no bank runs, a banking crisis is defined by the closure, merging or takeover of, or large-scale government assistance to, important financial institutions. The authors analyze a sample of 20 countries, which includes 26 banking crises and 76 currency crises according to their definition. Their model sets threshold values for various indicators covering developments of the financial, real and public sectors as well as foreign trading. Borio and Drehmann (2009) also apply the signal extraction method when they assess the risk of banking crises. Similar to Kaminsky and Reinhart (1999), they define a crisis by government interventions (capital injections, wholesale guarantees, recapitalization program) or the failure of large banks. They test the credit-to-GDP gap, property price gap and equity price gap as early warning indicators and find the credit-to-GDP gap to be the most useful indi-

cator of systemic risk. Alessi and Detken (2009) apply the signal extraction approach to identify asset price boom-bust cycles.

The probabilistic approach (2) is based on a multivariate logit model. Demirgüç-Kunt and Detragiache (1998) estimate the probability of a banking crisis for 65 countries over the period from 1980 to 1994. Their definition of a banking crisis is in a way similar to that of Kaminsky and Reinhart (1999), as they set their crisis dummy to zero if there is no crisis and to a value of one during a crisis.[3] They conclude that a weak macroeconomic environment (particularly with low growth and high inflation) contributes significantly to producing a systemic banking crisis. Lund-Jensen (2012) developed this approach further by designing a dynamic model that monitors systemic risk on the basis of real-time data.

In contrast to the signal extraction and the probabilistic approach, the index-based approach (3) defines a crisis not by a binary variable but by using a composite index. This index is then explained by (potential) early warning indicators. Lo Duca and Peltonen (2011) evaluate the joint role of domestic and global indicators in a panel framework (28 emerging market economies and advanced economies) to predict systemic events as quantified by their financial stress index (FSI). Jakubík and Slačík (2013) choose a similar approach for nine CESEE countries.

In this paper, we follow the third approach as the former two rely on the ex-post classification of crisis periods, which limits their predictive power. Our empirical analysis is based on a

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[3] For the purpose of this study, a banking crisis is deemed to be evident when one of the following predefined conditions holds: nonperforming assets exceed 10% of total assets in the banking system; the costs of rescue operations are higher than 2% of GDP; banks are nationalized on a large scale because of banking sector problems; extensive bank runs occur or emergency measures have to be taken.

continuous composite financial stress index for Austria (AFSI, see section 2), which allows for measuring the impact of the global financial crisis on the Austrian financial system. Potential early warning indicators are assigned to one of six risk channels (see section 3.1).

For identifying early warning indicators with high predictive power, we choose a new approach that is different to those used in the papers mentioned above (see section 3.3). First, we apply a best subset selection mechanism to find the best indicators for each given model size. Second, to address the variance-versus-bias tradeoff, we run a Kalman filter-based expected maximization algorithm to find the minimum model size. Third, in order to reduce model uncertainty, we use model-averaging techniques for the selected models in the previous two steps. In addition, this last step reflects our opinion that focusing on one single best model in macroprudential policy could result in misleading risk assessment.

In section 4, we present our results including a two-year out-of-sample forecasting exercise and policy implications derived from the empirical findings. Finally, section 5 concludes.

1 The Austrian Financial Stress Index (AFSI)

Quantifying financial stability to measure financial soundness plays an increasingly important role in macroprudential supervision. Since the IMF published its first list of core indicators (IMF Financial Soundness Indicators – FSIs) in 2001, other leading supranational authorities have followed suit. Most recently, in the euro area, Holló et al. (2012) constructed the Composite Indicator of Systemic Stress (CISS), an index that focuses on specific characteristics of the euro area financial system.

1.1 AFSI Construction

In general, contemporaneous financial soundness indices allow for gauging the current strength of the financial system. In order to obtain an index that can be used for real-time monitoring, market-based indicators are required as these are published without delay on a daily basis (unlike macroeconomic or supervisory data with their lower frequency and sometimes significant time lags). Obviously, market-based indicators have their drawbacks as they not only reflect the current market situation but market sentiment as well. However, as expectations materialize, e.g. through prices, market data do indeed mirror the buildup of longer-term structural imbalances (and their quick unraveling).

The above-mentioned properties of market-based indicators can be put to good use for constructing a real-time index. Ideally, such an index should reflect the soundness of the financial system as a whole as potential imbalances in the complex structure of financial systems with interconnected subsegments and agents (e.g. banks, insurance companies, governments, etc.) may influence the real economy, causing welfare losses. Therefore, similarly to Holló et al. (2012), Lo Duca and Peltonen (2011) and Jakubík and Slačík (2013), we design the AFSI as a composite index capturing risks for the Austrian financial system in three main segments: (1) the equity market, (2) the money market, and (3) the sovereign bond market. Equal weights are assigned to all three segments. A higher AFSI signals periods of imbalances in the financial system, peaking during times of acute financial distress.

We test various indices with regard to their suitability as AFSI constituents to see whether they comply with our criteria to best reflect (past) periods of financial distress. At the same time the

AFSI should be as simple as possible, so subindices with little or no additional explanatory power to the financial distress developments were not included. Following our analysis, we divide the equity market into three subindices (ATX[4] return, ATX volatility and Datastream Austrian Financials return[5]). ATX returns are negatively related to the AFSI, i.e. higher equity returns indicate a lower level of tension in the equity market. Equity volatilities, however, tend to rise with investors' uncertainty, hence increasing ATX volatility drives up the measure of distress. All three subindices are weighted equally and jointly make up the equity market segment.

To account for money market distress (2), we include the three-month EURIBOR-EUREPO spread[6] in the ASFI. As investors demand additional compensation for risky investments, the spread between the collateralized and uncollateralized interbank interest rate tends to increase substantially during periods of stress. Hence, if the EURIBOR-EUREPO spread decreases, the AFSI decreases as well. Finally, as the sovereign bond market represents one aspect of the overall financial market, we include the spread of Austrian government bond yields over German government bond yields as a measure of market distress associated with the sovereign sector (3).[7]

To summarize (see table 1), five components are included in the AFSI: the ATX year-on-year return, the Datastream Austrian Financials year-on-year return, the realized volatility of the ATX[8], the spread of the three-month EURIBOR over the three-month EUREPO and the spread of Austrian ten-year government benchmark bond yields over German ten-year government bond yields.

Unfortunately, the literature does not agree on one single method how to aggregate the variables of a composite index. Moreover, Illing and Liu (2003) have identified various shortcomings of the different approaches currently in use.

Table 1

AFSI Components

Segments	Equity market	Money market	Sovereign bond market
Weights Components (equally weighted)	1/3	1/3	1/3
	• ATX year-on-year return • Datastream Austrian Financials year-on-year return • Realized ATX volatility	• Three-month EURIBOR-EUREPO spread	• Spread of Austrian ten-year government benchmark bond yields over German ten-year government bond yields

Source: OeNB.

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[4] The ATX is the leading Austrian equity index; it tracks the price of Austrian blue chips traded at the Vienna stock exchange.

[5] The ATX covers a large share of industrial and energy industry corporates. To allow higher weights for financial sector developments, however, we include Datastream Austrian Financials return as a third equity subindex. This time series also covers Austrian financial sector data but is available for a longer time horizon than the ATX Financials series, which has only been available since 2010.

[6] Given the correlation of 0.99 between the EURIBOR-EUREPO spread and the EURIBOR-OIS spread, including the EURIBOR-OIS spread in the ASFI would add no further information to the AFSI.

[7] The AFSI including the volatility of the EURIBOR-EUREPO spread and of the spread between Austrian and German ten-year government benchmark bond yields shows a correlation of 0.99 with the AFSI not including these two volatility measures. Therefore, we do not include these volatility subindices in the AFSI. Furthermore, developments in the Austrian foreign exchange markets are not included in the AFSI, either, because the realized foreign exchange rate volatility based on a basket of the currencies of Austria's nine most important trading partners (excluding the euro area countries) shows high fluctuations over time without clearly indicating tense periods.

[8] Together, the first three ATX-related components make up one-third of the total AFSI, with each adding one-ninth to its total score.

One frequently applied option (which is e.g. used for constructing the CISS) is the transformation – based on a cumulative distribution function (CDF) – of variables so that they can be aggregated into one index within which each variable is ranked and divided by the number of observations in the sample.[9] The transformed variables are unit-free and measured on an ordinal scale in a range between 0 and 1, which makes interpretation easier. However, this approach assumes equal distance between any two successively ranked observations. This distorts any subsequent econometric analysis as the distances of observations of the dependent variable are a major driver of estimation results.[10] For a stress index in particular, the difference between peaks and average observations signals the level of tension during a crisis. Furthermore, stress might be overestimated during prolonged periods of financial stability when subsequent low index readings appear more volatile according to the CDF transformation ranking than they actually are. Considering these disadvantages, we are in line with Islami and Kurz-Kim (2013) in choosing an alternative approach. We standardize the subindices in the AFSI by variance-equal weighting: The arithmetic mean is subtracted from each variable before it is divided by its standard deviation.[11] This maps the AFSI to an interval scale, which shows that the distance between two observations – unlike in the case of a CDF transformation – does indeed carry information.

1.2 Financial (In)Stability as Indicated by the AFSI (for Austria) and the CISS (for the Euro Area)

The AFSI and the CISS differ in their construction and scaling, which means that their comparability is limited. Nevertheless, developments of financial stress and stability – as indicated by both indices – are found to be very similar in Austria and the euro area, as chart 1 shows. The AFSI remains below zero – indicating no financial stress in Austria – between 1999 and 2007. Similarly, the CISS signals financial stability in the euro area for the same period. Both indices are at their lowest levels between 2004 and 2005. However, we can observe higher fluctuations for the CISS than for the AFSI. These appear to be a result of the equal distance rank-based CDF method used for CISS construction (see previous section). Financial stress starts to build up in 2007, with CISS readings briefly jumping ahead of the AFSI values until both indices peak in the fourth quarter of 2008. This indicates that in the initial phase of the subprime crisis, financial stability was less impacted in Austria than in the euro area. However, the international market turmoil following the bankruptcy of Lehman Brothers in September 2008 had an immediate impact on both Austria and the euro area. The increase in the stress level following a short recovery indicates the European sovereign debt crises, with both indices peaking again in the fourth quarter of 2011. Surprisingly, the CISS shows significantly less

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[9] A variation of the CDF approach is quantile transformation, where each indicator is mapped into quantiles. This approach has advantages when dealing with outliers, but is less suitable in our case for the continuous monitoring of the Austrian data set.

[10] The problem becomes less important with the length of the time series and the range of values covered. However, when dealing with relatively short time periods, this issue is serious and may yield misleading results.

[11] The trade-off of this approach is that it requires the assumption of normally distributed subindices.

Chart 1

Austrian Financial Stress Index (AFSI) and Composite Indicator of Systemic Stress (CISS)

Index .... *Index*

AFSI (left-hand-scale) ——— CISS (right-hand-scale)
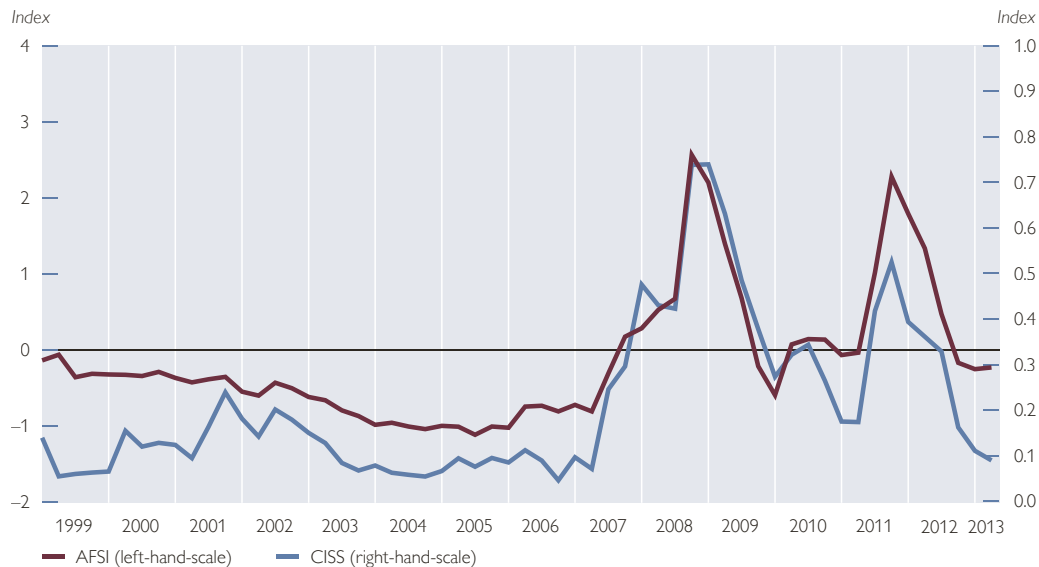
Source: OeNB, ECB.

instability during the sovereign debt crises than in late 2008 and also when compared to the AFSI. We interpret this, again, as a result of the aggregation method.

2 Early Warning Indicators

2.1 Analytical Framework

In the second part of our analysis we identify macroprudential early warning indicators to detect imbalances in financial stability as quantified by the AFSI. Pressure for the financial system can arise from various sources of systemic risk that disrupt the efficient allocation of capital and eventually impair economic growth and welfare. To begin with, we assign each potential early warning indicator to one of six risk channels, which at the same time constitute the starting point for our

quantitative analysis. These risk channels are (1) risk bearing capacity, (2) mispricing of risk, (3) excessive growth (4) concentration, (5) interconnectedness, and (6) the macroeconomic environment.[12]

If financial institutions, corporates and households are financially sound, their risk bearing capacity (1) is higher, so their individual ability to withstand stress will increase. This helps mitigate the propagation of financial instability in the financial system. Companies and households with lower indebtedness, higher earnings and/or higher disposable income are better capable to absorb financial shocks. In case of an economic downturn, borrowers' higher creditworthiness in turn tends to strengthen lenders' balance sheets, i.e. in an economy where financial intermediation

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[12] *The IMF (2011) distinguishes between the time dimension and the cross-sectional dimension of systemic risk. In our framework, the cross-sectional dimension is reflected by concentration and interconnectedness while the other channels can be attributed to the time dimension. Associated to the time dimension, the procyclicality mechanism reflects the increasing risk exposures observed during the boom phase and the risk aversion observed during the bust phase of a financial cycle.*

through banks plays such a prominent role, banks come under less pressure.

Collective mispricing of risk (2), often caused by misguided market expectations, may (slowly) lead to the buildup of significant systemic imbalances. The quick correction of the mispricing of risk through large movements in asset prices, with asset price bubbles eventually bursting, can lead to major distortions in the financial system.

Unsustainable or even excessive growth (3) may exacerbate the impact of the former two risk channels, thereby aggravating the risk to financial stability. For example, credit growth that constantly exceeds GDP growth can be classified as an indicator for unsustainable growth. It is important to note that excessive growth should not only be analyzed in standard loans but in all kinds of on- and off-balance debt.

With regard to contagion, we distinguish between two related, although distinct risk channels: concentration (4) and interconnectedness (5). The former is a measure of the uneven distribution of exposures, which is prone to amplify the impact of a single (default) event. Prominent examples include sectoral concentration in the banking system (e.g. property-related credit in Ireland or Spain during the buildup of the recent crisis) and dominant names on banks' books (e.g. Saad Groups' multi-billion dollar default in 2009). Interconnectedness captures the contagion risk based on spillovers caused by interlinkages of stakeholders in the financial system. Via these interlinkages, a (small) shock in one part of the system may be transmitted and another part of the system — with no direct exposure to the initial shock —

might come under pressure and thereby threaten wider financial stability. The most prominent example in the literature are the so-called default cascades that can be observed in banking systems as being driven by connections through interbank liabilities.

As macroprudential policy not only focuses on the financial system but also on the interaction of the financial system and the real economy, the macroeconomic environment and its outlook (6) constitute a substantial source of risk. In our case, Austria is not only affected by domestic developments, but as a small open economy it is prone to exogenous macroeconomic shocks. Domestic and foreign GDP growth, international trade dependency and the current low-interest environment are factors that may determine Austria's current and future financial stability.

2.2 Data Base Used for AFSI Estimation

Our data set of indicators considered for the AFSI, which aims to cover the six risk channels described in the previous section, consists of regulatory reporting data, market data (provided by Datastream) and macroeconomic data (retrieved from the OeNB's macroeconomic database). Given our objective of identifying indicators with an early warning capability, we use lagged variables in our estimations. We opt for a consistent four-quarter lag, as this would afford macroprudential authorities at least some time to react[13] to adverse developments in the AFSI by setting policy measures to counter detected systemic imbalances.[14]

For this paper, we base our econometric analysis on an observation hori-

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[13] For structural (macroeconomic as well as supervisory) data, moreover, a publication lag of at least one quarter must be taken into account.

[14] In addition, for market-based data we also include six- and eight-quarter lags with the aim of identifying the turning point of market sentiment.

zon that runs from the first quarter of 2000 to the third quarter of 2012, yielding *T = 51* time periods[15]. This *long sample* consists of 36 indicators. All indicators are tested for stationarity. Some appear to have a unit root although economic theory would suggests otherwise. Furthermore, for policy reasons (e.g. that allow a clear-cut interpretation of the credit-to-GDP ratio) we do not transform these variables to remove the probably spurious unit root.[16] For the purpose of robustness checks and in order to include further variables that only became available at a later point in time, we constructed an additional *short sample* of 31 additional indicators from the first quarter of 2005 to the third quarter of 2012.[17] Due to data restrictions such as changes in the regulatory reporting scheme (Basel II implementa-

tion, e.g. capital definitions and legal changes to the consolidation framework) not all predictors that might be of interest could be included in our analysis.

In table 2, we list all indicators – according to the above-mentioned risk channel framework – for the *long sample* together with their expected impact on the AFSI and the univariate regression results.[18] The latter should, however, only serve as a rough indication of variables that could be useful as early warning indicators. The dynamics of the AFSI can only be properly approximated with the help of an entire set of indicators, as the omitted-variable bias is substantial in each univariate regression unless the selected indicator is uncorrelated with all other indicators.[19]

Table 2

Indicators Used for AFSI Prediction (Long Sample)

Indicators	Description	Expected sign	Coefficient	Average value over sample period
Risk-bearing capacity				
Return on assets (average)	Ratio of return after taxes to total assets, average	+/–	0.73	0.36
Return on assets (20% percentile)	Ratio of return after taxes to total assets, 20% percentile	+/–	–2.44	0.21
Net interest margin	Ratio of net interst earnings to total assets	+/–	–3.34***	0.99
Interest rate spread	Net total of interest earnings in relation to interest bearing assets (on the one hand) and interest expenses in relation to interest bearing liabilities (on the other)	+/–	–3.46***	1.08
Loan-to-deposit (average)	Loan-to-deposit ratio, average	+	–0.14***	95.32
Loan-to-deposit ratio (80% percentile)	Loan-to-deposit ratio, 80% percentile	+	0.64***	101.45
Loan loss provisions ratio	Ratio of specific loan loss provisions to gross exposure	+	–1.38***	3.04
Bank ratings (average)	Total assets-weighted average bank rating	+	0.49***	7.24

Source: Authors' calculations.

*Note: *, ** and *** denote significance at the 1%, 5% and 10% level, respectively.*

[15] At the close of empirical data collection for this paper, not all structural data had been available for the fourth quarter of 2012 yet.

[16] It is a well known fact in time series literature on stationarity that standard unit root tests have low statistical power in that they cannot distinguish between true unit root processes and near unit root processes (e.g. slowly mean reverting processes). Some of the tested indicators show structural breaks that might induce a positive unit root test. However, as we use a linear model that is well known to exhibit a forecasting performance that is superior to that of nonlinear time series models, especially for a large data set, these breaks are not addressed directly.

[17] For an exhaustive list of all analyzed indicators and their availability, see annex.

[18] Concentration risk indicators were only included in the short sample.

[19] Lo Duca and Peltonen (2011) also find that considering indicators jointly in a multivariate framework outperforms considering stand-alone indicators.

Indicators Used for AFSI Prediction (Long Sample)

Indicators	Description	Expected sign	Coefficient	Average value over sample period
Mispricing of risk				
Spread of high-yield bonds (lag 4)	Spread between AAA bond yields on the one hand and CCC and lower bond yields on the other (lag 4)	–	0.00	694.68
Spread of high-yield bonds (lag 6)	Spread between AAA bond yields on the one hand and CCC and lower bond yields on the other (lag 6)	–	0.00	679.50
Spread of high-yield bonds (lag 8)	Spread between AAA bond yields on the one hand and CCC and lower bond yields on the other (lag 8)	–	0.00	649.01
EONIA (lag 4)	EONIA overnight interest rate	–	–0.04	2.29
EURO STOXX 50 return (lag 4)	EURO STOXX 50 year-on-year return (lag 4)	+	0.00	–4.00
EURO STOXX 50 return (lag 6)	EURO STOXX 50 year-on-year return (lag 6)	+	0.00	–3.57
EURO STOXX 50 return (lag 8)	EURO STOXX 50 year-on-year return (lag 8)	+	0.00	–2.49
EURO STOXX Banks return (lag 4)	EURO STOXX Banks year-on-year return (lag 4)	+	–0.00*	–4.96
EURO STOXX Banks return (lag 6)	EURO STOXX Banks year-on-year return (lag 6)	+	0.00	–5.44
EURO STOXX Banks return (lag 8)	EURO STOXX Banks year-on-year return (lag 8)	+	0.00	–4.72
VIX (lag 4)	Volatility of the Standard & Poor's 500 (lag 4)	–	0.00	21.94
VIX (lag 6)	Volatility of the Standard & Poor's 500 (lag 6)	–	0.00	21.81
VIX (lag 8)	Volatility of the Standard & Poor's 500 (lag 8)	–	–0.01	21.58
VSTOXX (lag 4)	Volatility of the EURO STOXX 50 (lag 4)	–	0.00	26.35
VSTOXX (lag 6)	Volatility of the EURO STOXX 50 (lag 6)	–	0.00	26.47
VSTOXX (lag 8)	Volatility of the EURO STOXX 50 (lag 8)	–	–0.02	26.19
Excessive growth				
Total credit growth	Total credit volume provided by all sectors to private sector year-on-year growth	+	0.08**	5.10
Total credit-to-GDP ratio	Ratio of total credit volume to GDP	+	0.04***	147.79
Total credit-to-GDP gap	Deviation of credit-to-GDP ratios from long-term trend	+	0.01	0.11
Customer loan growth	Private sector bank loans, year-on-year growth	+	0.01	4.38
Real estate loan growth	Real estate loans, year-on-year growth	+	0.00	1.04
Subsidized housing loan growth	Subsidized housing loans, year-on-year growth	+	–0.01	3.96
Real estate and subsidized housing loan growth	Sum of real estate loans' and subsidized housing loans' year-on-year growth	+	0.00	6.29
Total asset growth	Total assets, year-on-year growth	+	0.00	5.31
Off-balance sheet growth	Off-balance sheet positions, year-on-year growth	+	1.67	0.06
Interconnectedness				
Interbank assets, growth	Interbank assets, year-on-year growth	–	0.00	5.82
Interbank assets, share in total assets	Ratio of interbank assets to total assets	–	0.16**	29.93
Interbank liabilities, growth	Interbank liabilities, year-on-year growth	–	0.00	3.98
Interbank liabilities, share in total assets	Ratio of interbank liabilities to total assets	–	–0.13**	30.03
Macroeconomic environment				
GDP Austria	Austrian GDP, year-on-year growth	–	0.07	1.63
GDP EU-27	EU-27 GDP, year-on-year growth	–	0.00	1.33
GDP Germany	German GDP, year-on-year growth	–	0.12**	1.17
Inflation Austria	Consumer Price Index for Austria (2005=100)	+	0.36***	2.08
Banks' total assets-to-GDP ratio	Ratio of banks' total assets to GDP	+	0.86***	3.21
Current account-to-GDP ratio	Ratio of current account balance to GDP	–	0.17***	2.41
Exchange rate volatility	Exchange rate volatility based on a basket of the currencies of Austria's nine most important trading partners outside the euro area (based on import volumes)	+/–	43.40	0.00

Source: Authors' calculations.

*Note: *, ** and *** denote significance at the 1%, 5% and 10% level, respectively.*

2.3 Estimation Method

In this section we outline the economic theory and estimation procedure behind the multivariate models used to explain the AFSI. As a starting point for modeling the AFSI, we look at a linear regression model in which all explanatory variables are observable:

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

where y_i is the AFSI calculated by method i, k is the number of observable explanatory variables and $t \in \{1,2,..,T\}$ constitutes the time index; x_j is the j-th transformed macroeconomic predictor.

As noted in the introduction, the theoretical and empirical literature on how to select the most important predictors (x_j) is inconclusive. In previous work on this topic, predictors have been selected by mere qualitative reasoning. Lo Duca and Peltonen (2011) e.g. select predictors based on impact channels[20] while Jakubík and Slačík (2013) select predictors with a view to covering five risk channels.[21] To deal with the high variance-versus-low bias tradeoff in a nonheuristic way, we partly depart from these qualitative approaches and consider a data-driven subset selection mechanism.[22]

Among the different forms of subset selection, we opt for best subset selection, which for each $k \in \{0,1,2,..,p\}$ selects the subset of size k that gives the smallest residual sum of squares.[23] However, the best subset selection algorithm only chooses the n-best models for a given model size k (i.e. the number of selected predictors).[24] Therefore, we need an additional criterion to address the variance-versus-bias tradeoff. Following the procedure developed by Kerbl and Sigmund (2011), we test the influence of an unobserved component on the AFSI in a state space framework to measure the hypothetical bias of any omitted variables. We add an unobserved risk factor to the framework of equation (1) and refer to this new equation as the measurement equation (2). We explicitly model the unobserved risk factor as an autoregressive state process that evolves through time, thereby mimicking the behavior of many observable predictors, especially growth rates, and refer to this specification as the state equation (3).

$$y_{i,t} = X_{i,t}\Gamma_i + z_{i,t}\lambda_i + v_{i,t}$$
$$v_{i,t} \sim N(0, ri) \qquad (2)$$

$$z_{i,t} = \phi_i z_{i,t-1} + W_{i,t}$$
$$W_{i,t} \sim N(0, q_i) \qquad (3)$$

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 denote 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 equations between the sectors i, $Cov(w_{j,t}; w_{i,t}) = 0$ and $Cov(v_{i,t}; v_{i,t}) = 0$ for any $i \neq j$.

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[20] Lo Duca and Peltonen (2011) cover domestic and global factors as well as interactions between them.

[21] Jakubík and Slačík (2013) cover sovereign risk, the banking sector, contagion risk, the real sector and macroeconomic indicators.

[22] Although more shopisticated selection mechanisms are available, we choose subset selection for interpretation purposes.

[23] We use the leaps and bound procedure by Furnival and Wilson (1974), which is implemented in the R-package "leaps."

[24] For a given model size, we searched for the six combinations of variables with the best fit (measured by R^2) out of all possible combinations.

We estimate the equation systems (2) and (3) via an expectation maximization (EM) algorithm.[25] 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. We repeat these steps until convergence occurs.[26, 27]

To judge whether a latent factor is statistically significant within each estimated model, we follow Koopman et al. (2009) and conduct a likelihood ratio (LR) test defined by

$$2\left(l_u - l_r\right) \overset{a}{\sim} X_m^2$$

where l_u represents the likelihood of the unrestricted model with the latent factor and l_r the likelihood of the restricted models without this factor. m is the number of restrictions implemented. The only imposed restriction is $\lambda_i = 0$ (see equation 2).

If the latent factor is statistically not significant in any model with model size k^l, none of the models with $k < k^l$ is used for further analysis such as model averaging and forecasting. k^l is therefore the lower bound on model size in the variance-versus-bias tradeoff. The upper bound k^u will be determined by the mean squared error in a hypothetical out-of-sample forecasting exercise.

3 Estimation Results

In a first step we generate output for selected models based on the best subset selection mechanism. Once these models are selected, we determine the lower (k^l) and upper bound (k^u) of model size kl to identify the models which we use for model averaging. We run a Kalman filter EM algorithm estimation procedure to find the minimum model size following the methodology described in section 3. We find that with six or more predictors, the additional latent factor does not significantly contribute to the model fit. Therefore, we fix the k^l at six.

As a next step, we re-estimate the selected models for the period from the first quarter of 2000 to the third quarter of 2010 (instead of the third quarter of 2012), calculate an out-of-sample forecast and compare the mean squared forecasting error of all models. We find that the average mean squared forecasting error is the lowest for model sizes from six to ten. Therefore, $k^u = 10$. Hence, we use the best subset of models size k, where $k = 6, \dots, 10$.

Chart 2 presents the frequency with which these models contain a certain explanatory variable, i.e. an early warning indicator. The default lag for each indicator is four quarters (see section 3.2) if not explicitly indicated otherwise. Moreover, the blue bars represent the fraction in which this variable has a positive sign; the purple bars indicate a negative sign. Again, we classify the indicators with respect to our risk channel framework (see section 3.1).

Among the risk-bearing capacity indicators, average bank ratings and the loan loss provision ratio (LLPR) are selected in more than 30% of the best subsets. Bank ratings have the expected positive sign, confirming that a wors-

[25] See McLachlan and Thriyambakam (1996) for details.

[26] See Shumway and Stoffer (2006) and Holmes (2010) for details.

[27] As the state space representation of a given dynamic system might not be uniquely defined by a given parameter set without restricting some of these parameters (see Hamilton, 1994; Carro et al., 2010), we fix the metric of the unobserved variable by restricting $qi = 1$ without loss of generality.

Chart 2

Relative Frequency of Selected Indicators

Risk-Bearing Capacity
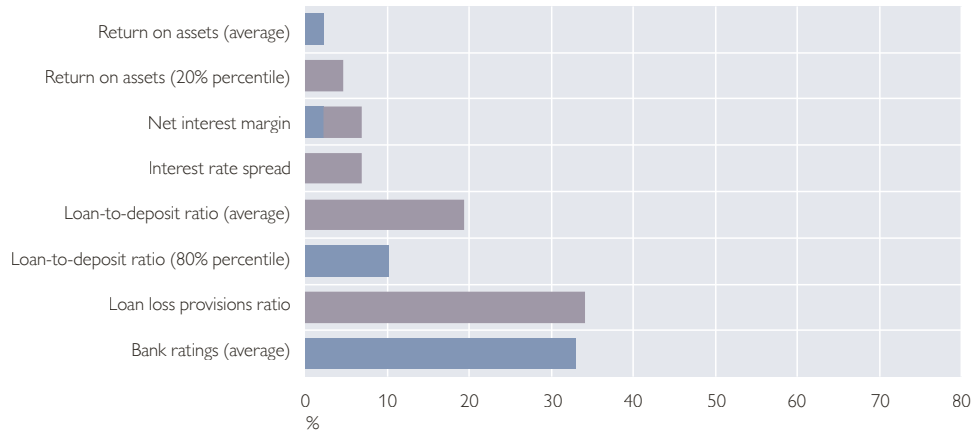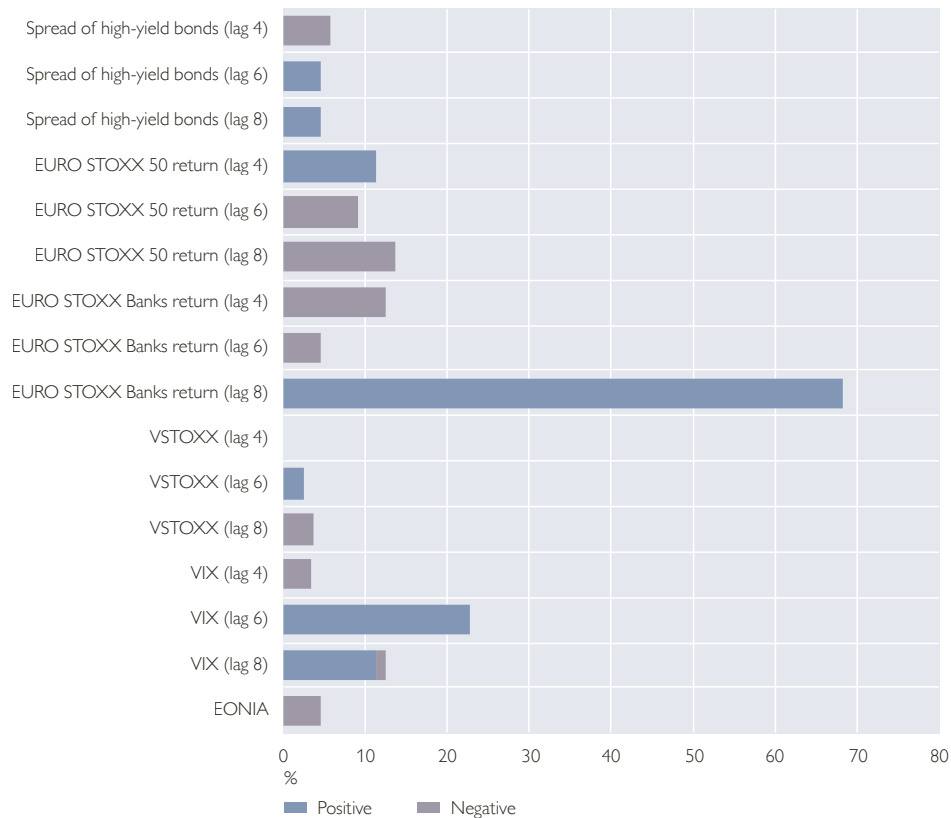
Mispricing of Risk

Source: OeNB.

Note: Blue bars show the fractions assigned to positive coefficients for the particular macroeconomic indicators. If an indicator was not selected, no bar is shown. All indicators are lagged by four quarters unless otherwise indicated.

ening of bank ratings increases the AFSI, which indicates a deterioration of financial stability in Austria. However, the LLPR consistently carries a nega-

tive sign. We interpret this in two ways: 1) the provisioning cycle lags the (market-based) AFSI; 2) a clean-up of banks' portfolios and hence a higher

Relative Frequency of Selected Indicators

Excessive Growth
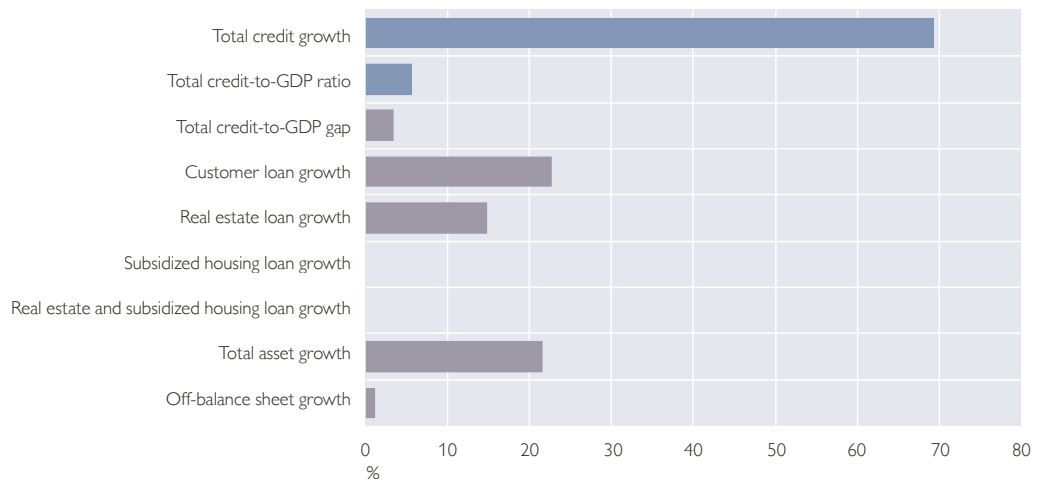
Interconnectedness
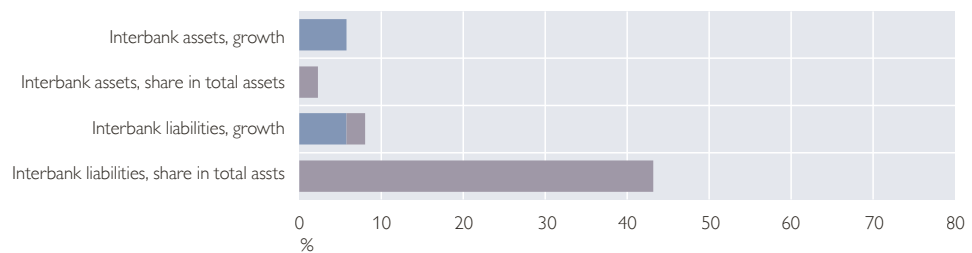
Macroeconomic Environment
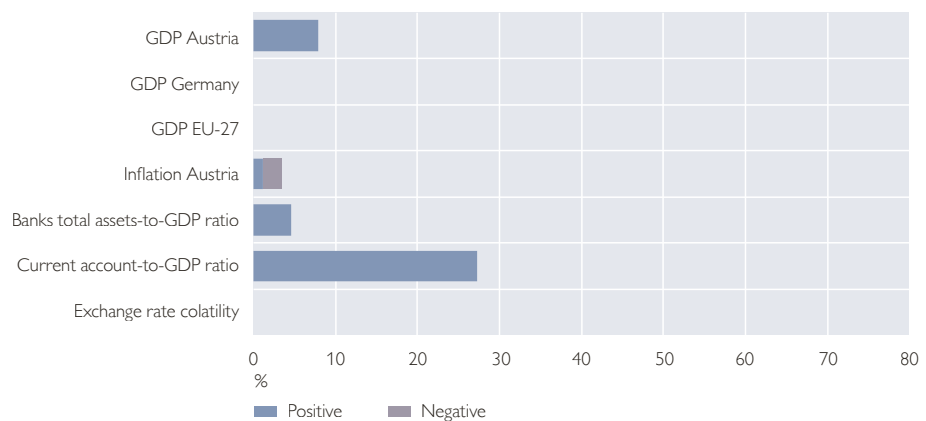
Source: OeNB.

Note: Blue bars show the fractions assigned to positive coefficients for the particular macroeconomic indicators. If an indicator was not selected, no bar is shown. All indicators are lagged by four quarters unless otherwise indicated.

LLPR might actually indicate improving financial stability. Moreover, the negative sign of the average loan-to-deposit (LTD) ratio might at first glance appear counterintuitive. However, the positive sign of the 80th-percentile LTD (meaning that 20% of the Austrian banks have a higher LTD) puts the combined result into perspective. We conclude that on average Austrian banks draw on sound,

deposit-based refinancing while a deterioration of the LTD at the less stable refinanced banks has the expected negative influence on financial stability in Austria. Furthermore, results based on the short sample seem to indicate that the total level of corporate indebtedness contributes positively to the AFSI.

Concerning indicators of mispricing of risk, the EURO STOXX Banks return index has the highest selection rate in our best subsets. The sign of the relation between the AFSI and the EURO STOXX Banks return index tends to depend on the length of the lag. The consistently negative impact on Austrian financial stability associated with high levels of EURO STOXX Banks returns with a lag of eight quarters could be associated with boom phases that have negative consequences eight quarters later. Returns based on shorter lags are less often selected in our models, but show the expected negative coefficient, which indicates that recently realized returns reduce stress levels. Together with the results on the broader EURO STOXX 50 return index, which is not as important for explaining the AFSI as the more specific EURO STOXX Banks return index, there might be evidence that the business cycle and the financial cycle are not completely synchronized. The volatility of the Standard & Poor's 500 index (VIX), which has a relatively higher selection rate compared to the volatility of the EURO STOXX 50 index (VSTOXX), seems to be a better indicator for the 2007/08 crisis, which had its origins in the U.S. subprime market.

Among the indicators of excessive growth, total credit growth[28] turns out to be an important early warning indicator. The variable with the expected positive sign is included in approximately 70% of all models. Surprisingly, customer loan growth is found to be negatively related to the AFSI. While total credit reflects all types of companies' and households' debt (including e.g. bonds, trade credits and other nonbank debt), customer loans are defined more narrowly and include only bank loans. We conclude that financing sources other than bank credit are of relevance for financial stability in Austria.

Turning now to the indicators of interconnectedness, the multivariate regressions show that the most important indicator is the share of interbank liabilities. It carries the expected negative sign in explaining the AFSI. We see this as a confirmation of the – at least historically valid – thesis that a high share of interbank liabilities indicates positive market sentiment, i.e. a well-functioning (short-term) interbank market. However, strong interlinkages obviously posed a challenge to financial stability-oriented policymakers, as the high degree of interconnectedness in the banking system reinforced the financial shock waves following the bankruptcy of Lehman Brothers.[29] Finally, and also somewhat surprisingly, the variables covering macroeconomic environment appear to be less important as early warning indicators for Austrian financial stability than the variables assigned to the other risk channels. These results are, however, in line with our findings on the mis-

[28] As Drehman (2013) argues, including all types of credit to the nonfinancial sector when quantifying indebtedness has an additional explanatory value for crisis prediction.

[29] This corroborates the rationale for liquidity regulation (see Schmitz and Ittner, 2007); if market failure can indeed cause such significant externalities, regulation policy needs to change the mode of financial intermediaries' refinancing even if such a change incurs additional costs in benign times. In our models, this circumstance might impact estimation results, as the role of the short-term interbank market as a source of refinancing might change.

pricing of risk, namely that the business and financial cycles appear not to be synchronized, with the former lagging behind the latter.

In addition to the early warning indicators depicted in chart 2, we applied the same econometric analysis on an extended data set for a *short sample* (first quarter of 2005 to third quarter of 2012). Overall, the estimation output yields similar results for the overlapping indicators, which in turn serve as a valuable robustness check for our main results. The large exposure ratio[30] has the expected positive sign, indicating that higher concentration risk drives up the stress level as measured by a rise in the AFSI. Another indicator that is selected in a quarter of all models for the *short sample* is the impact of banks' liquidity position on credit standards. It is defined in the interval [−1,1] and measures to what degree banks' lending policy is affected by liquidity shortage. A negative value of

this variable means that banks' lending is highly restricted. We find a negative coefficient, which means that liquidity constraints induce stress in the Austrian financial system.

Returning to our two-year out-of-sample forecast for the period from the fourth quarter of 2010 to the third quarter of 2012 (see chart 3), we use a model-averaging procedure for assessing the six predefined systemic risk channels in order to limit model uncertainty. The results indicate that excessive growth, interconnectedness and mispricing of risk are the most important channels through which risks to financial stability are transmitted in Austria. Our paper shows that, due to the complex nature of the interaction between the individual risk factors, it is necessary to look at a set of indicators simultaneously to account for the various risk drivers behind financial instability. Despite an impressive out-of-sample forecasting performance, we

Chart 3

Predicted (In- and Out-of-Sample) AFSI versus Realized AFSI
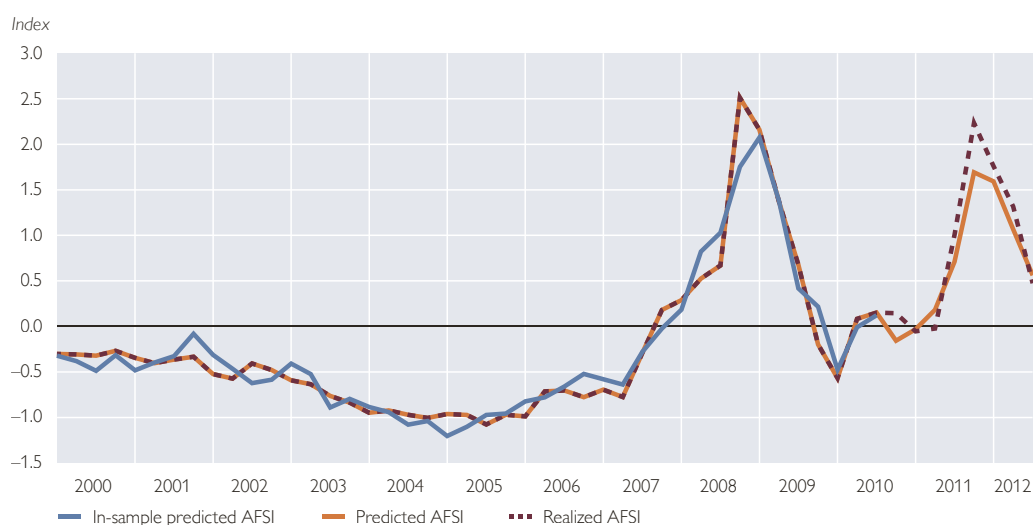
Source: OeNB.

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[30] *The large exposure ratio is defined as the share of large exposure (i.e. an exposure exceeding EUR 500,000 and/or of more than 10% of the eligible capital) to total assets.*

are acutely aware that some indicators that performed well during stressful periods for the Austrian financial system in 2008 and 2011 might not necessarily be equally important in predicting a future increase in the stress level. More broadly speaking, we have to understand that even the best models cannot exonerate us from subjective judgment in the interpretation of results and, consequently, in the formulation of macroprudential policy. For instance, the indicators covering property-related credit growth in Austria did not contribute to significant forecasting results of changes in stress levels as measured by the AFSI. However, due to the recent sharp rise of real estate prices after a decade of mere stagnation, it can be argued that monitoring real estate market developments will likely gain importance in the future, although the related indicators are currently not selected in our models.

Similarly, the relative importance of international market variables reflects the status of Austria as a small open economy, which adds an additional layer of complexity to macroprudential analysis in Austria. As domestic exposure represents the largest part of Austrian banking assets, this paper's focus on domestic financial stability is well justified. Nevertheless, the Austrian financial system is significantly influenced by external sources. Global and European market developments, the economic situation of Austria's main trading partners and the high degree of Austrian financial intermediaries' exposure to the CESEE region affect financial stability in Austria. Local developments in other countries that could have a major impact on Austrian financial stability are beyond the scope of our current framework. As a consequence, macroprudential supervision should ensure that nondomestic indica-

tors are monitored constantly in order to capture relevant external developments at an early stage.

4 Conclusion

This paper has two objectives: First, we develop the Austrian Financial Stress Index (AFSI) as a continuous measure of the current financial stability situation in Austria. We believe the AFSI will add significant value to monitoring and benchmarking during day-to-day macroprudential supervision. Second, we identify early warning indicators and risk drivers that have sufficient predictive power to identify developments in the Austrian financial system as measured by the AFSI. Assigning each early warning indicator to one of six predefined risk channels has produced plausible results. These results also imply that these indicators should not be analyzed on a stand-alone basis, but based on an integrated analytical framework. Our proposal serves as a quantitative starting point for constant monitoring during macroprudential supervision as envisaged in the upcoming implementation of macroprudential tools via Basel III (Capital Requirements Directive IV (CRD IV) and Capital Requirements Regulation (CRR)). We believe that this empirical approach will contribute positively to macroprudential policy-making and thereby strengthen the resilience of the financial system.

However, our early warning framework would benefit from additional input. Several indicators (e.g. capitalization of financial intermediaries or network contagion indicators) are not available in longer time series. Our analysis focuses predominately on banks, since they play a crucial role as financial intermediaries in the Austrian economy because they often act as the single providers of credit to the corporate sector. Nevertheless, we should not underesti-

mate the importance other financial intermediaries have for financial stability in Austria. Moreover, as Austria is a small open economy with a large banking system that has significant cross-border assets, its financial stability is obviously also influenced by external sources. In a further step, our analyses would benefit from further external indicators and possibly the creation of a cross-country panel. But no matter how sophisticated our models become, it is most unlikely that financial stability and systemic risk can ever be irrevocably quantified.

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Annex

Comprehensive List of Variables Used for ASFI Prediction (Including Data Availability Periods)

Indicators	Data availability periods		Sample
	From	To	
Risk-bearing capacity			
Bank ratings (average)	Q3 95	Q4 12	L
Return on assets (20% percentile)	Q1 99	Q4 12	L
Return on assets (average)	Q1 99	Q4 12	L
Return on assets (80% percentile)	Q1 99	Q4 12	L
Loan-to-deposit ratio (average)	Q1 99	Q4 12	L
Loan-to-deposit ratio (20% percentile)	Q1 99	Q4 12	L
Loan-to-deposit ratio (80% percentile)	Q1 99	Q4 12	L
Interest rate spread	Q1 95	Q4 12	L
Net interest margin	Q1 95	Q4 12	L
Loan loss provisions ratio	Q4 95	Q4 12	L
Ratio of corporate debt to profit	Q1 03	Q4 12	S
Ratio of household debt to disposable income	Q1 03	Q4 12	S
Interest margin for corporate loans	Q1 03	Q4 12	S
Interest margin for loans to households	Q1 03	Q4 12	S
Interest margin (average)	Q1 03	Q4 12	S
Core tier 1 ratio, credit risk, consolidated	Q4 04	Q4 12	
Tier 1 ratio, credit risk, consolidated	Q4 04	Q4 12	
Tier 1 ratio, consolidated	Q4 04	Q4 12	
Core tier 1 ratio, consolidated	Q1 08	Q4 12	
Tier 1 ratio, consolidated (20% percentile)	Q4 04	Q4 12	
Tier 1 ratio, consolidated (average)	Q4 04	Q4 12	
Leverage ratio, consolidated (20% percentile)	Q4 04	Q4 12	
Leverage ratio, consolidated (average)	Q4 04	Q4 12	
Leverage, consolidated (80% percentile)	Q4 04	Q4 12	
Ratio of risk-weighted assets to total assets, consolidated (20% percentile)	Q4 04	Q4 12	
Ratio of risk-weighted assets to total assets, consolidated (average)	Q4 04	Q4 12	
Return on assets, consolidated (20% percentile)	Q1 05	Q4 12	
Return on assets, consolidated (average)	Q1 05	Q4 12	
Return on assets, consolidated (80% percentile)	Q1 05	Q4 12	
Return on equity, consolidated (20% percentile)	Q1 05	Q4 12	
Return on equity, consolidated (average)	Q1 05	Q4 12	
Return on equity, consolidated (80% percentile)	Q1 05	Q4 12	
Loan-to-deposit ratio, consolidated (20% percentile)	Q1 05	Q4 12	
Loan-to-deposit ratio, consolidated (average)	Q1 05	Q4 12	
Loan-to-deposit ratio, consolidated (80% percentile)	Q1 05	Q4 12	
Nonperforming loans	Q1 08	Q1 12	
Mispricing of risk			
Spread of high-yield bonds	Q1 98	Q4 12	L
EONIA	Q1 99	Q4 12	L
VSTOXX (volatility of the EURO STOXX 50)	Q1 99	Q4 12	L
VIX (volatility of the Standard & Poor's 500)	Q1 95	Q4 12	L
EURO STOXX 50 return	Q1 95	Q4 12	L
EURO STOXX Banks return	Q1 95	Q4 12	L
Residential property prices, growth rate	Q1 01	Q4 12	S
Ratio of residential property prices to disposable income	Q1 00	Q4 12	S
Gap between house price growth and disposable income growth	Q1 01	Q4 12	S
EURO STOXX 50, price book ratio	Q2 01	Q4 12	
EURO STOXX Banks, price book ratio	Q2 99	Q4 12	

Source: OeNB.

Note: L = long sample, S = short sample; if no sample is indicated, the respective data series were not included in the model selection for reasons of data availability or owing to economic insignificance.

Comprehensive List of Variables Used for ASFI Prediction (Including Data Availability Periods)

Indicators	Data availability periods		Sample
	From	To	
Excessive growth			
Total asset growth	Q1 96	Q4 12	L
Real estate loan growth	Q4 96	Q3 12	L
Subsidized housing loan growth	Q4 96	Q3 12	L
Real estate and subsidized housing loan growth	Q4 96	Q3 12	L
Total credit growth	Q1 95	Q3 12	L
Total credit-to-GDP ratio	Q1 95	Q3 12	L
Total credit-to-GDP gap	Q1 99	Q3 12	L
Customer loan growth	Q4 96	Q4 12	L
Off-balance sheet growth	Q1 96	Q4 12	L
Private sector loan growth	Q3 00	Q4 12	S
Total assets growth, top 6 banks	Q1 05	Q4 12	
Share of other financial intermediaries in financial assets of MFIs	Q1 06	Q4 12	
Interconnectedness			
Interbank assets, growth	Q4 96	Q4 12	L
Interbank assets, share in total assets	Q4 95	Q4 12	L
Interbank liabilities, growth	Q4 96	Q4 12	L
Interbank liabilities, share in total assets	Q4 95	Q4 12	L
Concentration risk			
Ratio of large exposures to total assets	Q2 01	Q4 12	S
Macroeconomic environment			
Exchange rate volatility	Q1 99	Q4 12	L
Inflation Austria	Q1 95	Q4 12	L
GDP EU-27	Q1 95	Q4 12	L
GDP Germany	Q1 95	Q4 12	L
GDP Austria	Q1 95	Q4 12	L
Banks' total assets-to-GDP ratio	Q1 95	Q4 12	L
Current account-to-GDP ratio	Q1 95	Q4 12	L
Historical quarterly GDP forecasts (OeNB)	Q2 99	Q4 12	S
Sentiment indicator (Federation of Austrian Industries)	Q1 00	Q4 12	S
Sentiment indicator (Austrian Economic Chambers)	Q4 02	Q4 12	S
Average of sentiment indicators (Federation of Austrian Industries and Austrian Economic Chambers)	Q3 02	Q4 12	S
Ratio of household debt to GDP	Q1 03	Q4 12	S
Ratio of corporate debt to GDP	Q1 03	Q4 12	S
Ratio of public debt to GDP, EU-27	Q4 00	Q3 12	S
Ratio of public debt to GDP, Austria	Q1 00	Q4 12	S
Credit standards for loans to enterprises	Q4 02	Q4 12	S
Credit standards for long-term loans to enterprises	Q4 02	Q4 12	S
Impact of equity costs on credit standards	Q4 02	Q4 12	S
Impact of money market on credit standards	Q4 02	Q4 12	S
Impact of liquidity position on credit standards	Q4 02	Q4 12	S
Impact of refinancing costs on credit standards	Q4 02	Q4 12	S
Development of loan volume	Q4 02	Q4 12	S
Development of collateral requirements	Q4 02	Q4 12	S
Development of covenants	Q4 02	Q4 12	S
Development of maturities	Q4 02	Q4 12	S
Expected development of credit standards	Q4 02	Q4 12	S
Expected development of credit standards for long-term loans	Q4 02	Q4 12	S
Insolvencies, production sector	Q1 95	Q4 12	
Insolvencies, services	Q1 95	Q4 12	
Insolvencies, construction	Q1 95	Q4 12	
Insolvencies, trade	Q1 95	Q4 12	
Insolvencies, transportation	Q1 95	Q4 12	
Insolvencies, tourism	Q1 95	Q4 12	
Insolvencies, total	Q1 95	Q4 12	

Source: OeNB.

Note: L = long sample, S = short sample; if no sample is indicated, the respective data series were not included in the model selection for reasons of
data availability or owing to economic insignificance.

Credit Boom in Russia despite Global Woes – Driving Forces and Risks

Stephan Barisitz[1]

After the crisis slump of 2008–2009, real year-on-year credit growth in Russia turned into a boom in 2011, with double-digit growth climaxing at +24% in mid-2012, before slowing down again. The ratio of domestic credit to GDP is, however, not high compared to peer countries. Retail lending, while still modest, developed most dynamically. Yet domestic deposits rose even more swiftly than domestic loans, and the loan-to-deposit ratio slightly declined. The driving forces of the Russian credit boom are (a) on the demand side: the oil price recovery (from early 2009 to early 2012) and relatively brisk domestic demand growth, partly driven by generous public salary and pension adjustments, and financial deepening in the highly profitable retail sector; (b) on the supply side: the "deposit boom," increasing profits of resource enterprises, and official liquidity assistance. Risks related to the credit boom include surging unsecured consumer loans (+44% in real terms in 2012, thus accounting for 60% of household credit), widespread connected lending, elevated levels of nonperforming loans (NPLs), and modest provisioning. The Central Bank of the Russian Federation (CBR) reacted to the (consumer) credit boom by moral suasion and some prudential measures. The deceleration of lending growth since mid-2012 was probably largely due to the general economic slowdown. Shock-absorbing factors are considerable, including growing deposits as well as satisfactory profitability and the banking sector's net external creditor position, but some factors, such as capital adequacy and loan loss provisions, have been eroding recently. In the current economic situation, the most probable outlook for the Russian lending boom is a soft landing.

This study examines the driving forces and risks of the current swift lending growth in Russia. In an environment of global uncertainties and economic stagnation or feeble growth in Europe, only few Central, Eastern and Southeastern European (CESEE) economies — for various reasons — witness strong credit expansion, e.g. Turkey, Moldova, Armenia, Azerbaijan, Mongolia and Russia. This study links up with an article by Barisitz and Lahnsteiner (2010) on the Russian banking sector. Following the introduction, section 1 provides a succinct overview of salient features of the Russian banking sector's development since 2010 (the previous period is covered by the publication just mentioned). Based on a review of topical literature and up-to-date information and statistics, section 2 presents probable driving forces of the credit boom. These driving forces may be structured in demand-side and supply-side factors. Section 3 identifies risks generated by or accompanying the credit boom. The policy reactions of the Central Bank of the Russian Federation (CBR, Bank of Russia) as well as reasons for the most recent slowdown of lending growth are dealt with in section 4. Section 5 assesses other shock-absorbing factors. Finally, an outlook sketches likely near-term developments and scenarios.

Refereed by:
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1 Outline of the Banking Sector's Development and Credit Growth since Late 2010

After the crisis slump of 2008–2009, real credit[2] growth in Russia turned positive (year on year) in the fall of 2010, producing a modest expansion of 3.5% at end-2010. Crisis-related state support to banks was successively withdrawn: Improved liquidity enabled banks to repay uncollateralized CBR refinancing ahead of schedule (in 2009 and early 2010), relaxed loan classification rules were discontinued for new loans in mid-2010, and CBR guarantees on interbank lending were unwound by the end of that year (IMF, 2011, p. 8). As chart 1 illustrates, in 2011, lending growth accelerated substantially (+21.0% at end-2011) and thus fueled economic growth. Credit growth reached its climax in mid-2012 (+24.0%), before receding to a still brisk 11.3% rate of increase at end-September 2013. The ratio of credit to GDP rose from about 40% in mid-2010 to 46% in mid-2013 (table 1).[3]

While in this study we do not define a "credit boom" in statistical terms, the strong credit growth Russia has witnessed in recent years can be regarded as unusual or extraordinary in a post-global financial crisis framework and therefore appears worth investigating in more detail.[4]

Loans to households, including mortgage loans, surged. At its apex in

Chart 1

Russia: Real Credit Growth from the Pre-Crisis to the Post-Crisis Boom

%, year on year, CPI deflated

Total loans (excl. interbank loans) — Loans to enterprises and nonfinancial organizations — Loans to households
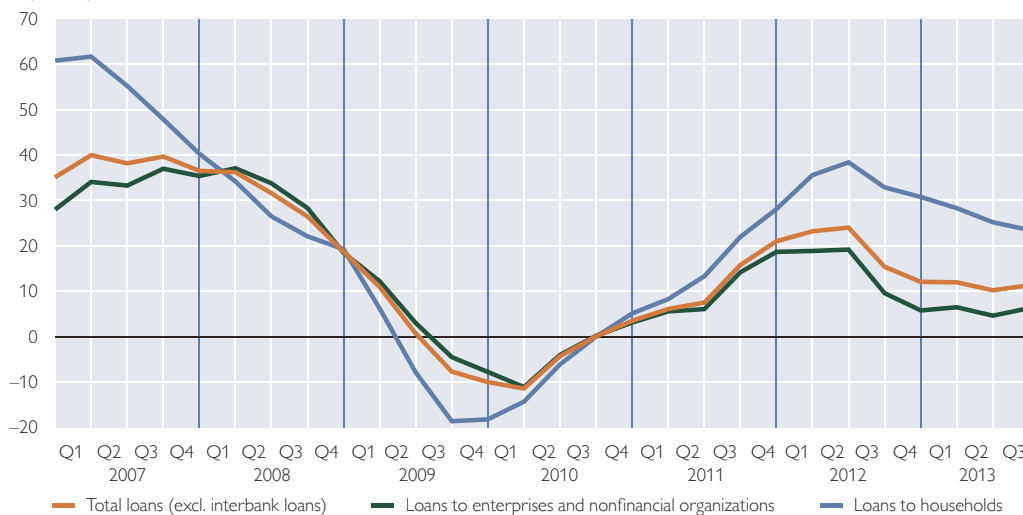
Source: Bank of Russia.

[2] *In the following, credit is understood to comprise commercial bank loans including loans to government agencies and nonresidents, but excluding loans to other credit institutions. Credit growth is measured in real terms (deflated by the year-on-year CPI) because Russian inflation is relatively high and variable (between 4% and 10% in the observation period).*

[3] *This level remains relatively low in an international comparison, though.*

[4] *In contrast, if we look at longer-term developments in the Russian banking sector, namely as from the 1990s, very high growth rates (e.g. above 20% in real terms year on year) are by no means extraordinary (see also pre-2008 years in chart 1). Thus, as pointed out by Jafarov (2013, p. 28), between 2001 and 2008, average annual credit growth amounted to 28% in real terms in Russia.*

mid-2012, retail credit expansion exceeded 38% (in real terms, year on year).[5] At end-September 2013, loans to households were still over 23% larger than they had been a year ago. Within retail loans, uncollateralized consumer credits[6] rose most dynamically (+54% in mid-2012, +38% at end-March 2013). Loans to enterprises also boomed, but less spectacularly (mid-2012: +19%), and they decelerated much more swiftly (end-June 2013: +4.6%), before slightly regaining momentum (end-September: +6.3%). Therefore, while the credit boom to households is far from over, real loan growth to enterprises currently does not much exceed overall economic growth. In absolute terms, though, enterprise loans contributed about 60% more than household loans to Russian credit expansion from 2010 to 2013. The share of retail loans in total loans in the last three years rose several percentage points to 29%; mortgage loans continue to make up about a quarter of household loans. Neither of the last two ratios is elevated in comparison to peer countries.[7] The share of foreign currency loans in total loans decreased from 23% in mid-2010 to 17% at end-September 2013. Foreign currency loans still make up over one-fifth of enterprise loans, but play an insignificant role in retail lending (about 3%).

From mid-2010 to end-September 2013, total deposits rose even a bit more swiftly than total loans, although the expansion was somewhat smoother, with growth rates fluctuating a bit less. Deposit expansion peaked in 2011 (+20.3%), while household deposits had grown most in 2010 (+20.6%). The ratio of deposits to GDP increased from 33% to 40% (mid-2013). There is no doubt that credits as *well as deposits* have boomed in Russia in recent years. The deposit boom has been driven primarily by households, but also by enterprises, with both largely maintaining their shares in total deposits (about 60% versus 35%). Accordingly, the loan-to-deposit ratio somewhat *declined* from 122% in mid-2010 to 119% three years and three months later. Foreign currency-denominated deposits decreased from slightly below 30% of total deposits in early 2010 to around a quarter in 2011, then stayed at about this level. Margins between average retail deposit rates and enterprise lending rates slightly narrowed to about 4% over the observation period.

Nonperforming loans (NPLs) in their narrow as well as broad definition[8] gradually declined from 9.5% and 20.0% of total loans in mid-2010 to 6.6% and 15.1% at end-September 2013 (see also chart 3, which, however, identifies the NPL threshold only as the broad definition, which is explained further below). Despite this decline, loan loss provisions have not quite covered NPLs in their narrow definition in recent months. Banks' liabilities to the CBR substantially increased from about

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[5] Thus the retail credit growth rate almost equaled pre-crisis highs (2007: +41.0%).

[6] For a more detailed description and discussion of uncollateralized or unsecured consumer credits, see subsection 3.1.

[7] See also the comparison of ratios of retail and mortgage loans to GDP for Russia and peer countries under subsection 2.1.3.

[8] The narrow definition of NPLs chosen here corresponds to the share of problem loans (quality category IV) and bad loans (category V) in total loans (in this case including interbank loans), while the broad definition of NPLs reflects the share of doubtful (category III), problem (category IV) and bad loans (category V) in total loans (including interbank loans), as stipulated in CBR regulation no. 254 (Central Bank of the Russian Federation, 2004).

1% of their total liabilities in late 2010 to around 4%–6% from mid-2012. This probably reflected stepped-up liquidity assistance to the sector in a situation when lending had started to boom and some liquidity bottlenecks had made themselves felt. At the same time, banks apparently drew down their claims on the CBR from about 5% to 3% of total assets. As can be expected during a credit boom, capital adequacy gradually declined from a relatively high level (18.9% in mid-2010) to 13.4% at end-September 2013 (table 1).[9] The substantial decline pushed this indicator to a level somewhat lower than that reached during the boom period preceding the crisis of 2008–2009. Profitability slowly recovered from the crisis, may have reached a climax in the second half of 2012 (end-September 2012: ROE: 18.3%), and has since then slightly declined (end-September 2013: ROE: 16.1%). Russian banks' profitability is distinctly lower than what had been attained before the crisis, but higher than in most other CESEE countries.

2 Driving Forces of the Russian Credit Boom

The forces that triggered the strong credit expansion in Russia may be broken down into several demand-side and supply-side factors.

2.1 Demand-Side Factors
2.1.1 Oil Price Recovery and Relatively Brisk Economic Growth (until Recently)

Prices of oil and gas as well as of metals and other raw materials, which are Russia's main export goods, augmented (again) in recent years (see chart 2), which in turn caused resource enterprise profits and profit expectations to rise and allowed for sustained increases in household incomes as well as for expectations of rising household incomes. In an environment of low unemployment,[10] these economic trickle-down effects contributed to relatively brisk consumption and an investment-fueled economic recovery, which helped reignite and stimulate credit growth in Russia.

Chart 2

World Market Prices for Oil, Metals and Other Raw Materials

HWWI "Euroland" index, 2010=100, euro based
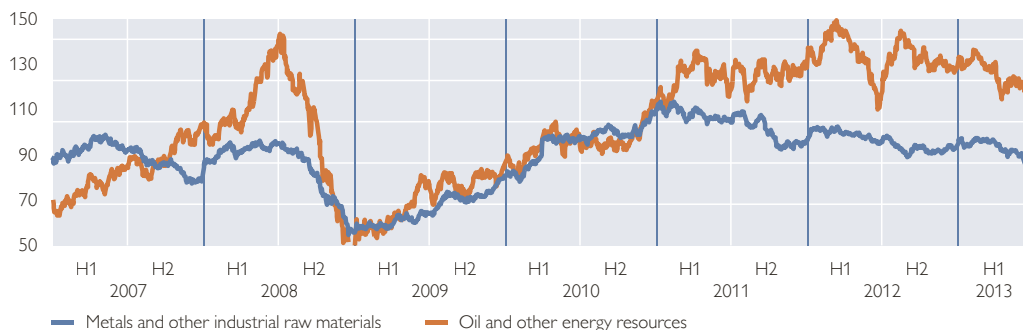
Source: HWWI.

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[9] The CBR's mandatory capital adequacy minimum is 10%.

[10] In September 2013, the Russian jobless rate (ILO definition) was 5.3%.

2.1.2 Generous Public Sector Salary and Pension Adjustments

The authorities seem to have played a major role in driving income increases in recent years. Benefiting from the tide of rising energy prices, the government repeatedly raised public sector salaries as well as public pensions: Cases in point are strong pension increases in the last quarter of 2009, smaller public sector salary raises in the last quarter of 2010 followed by heftier ratcheting-up in the second half of 2011, and smaller upward adjustments of both public salaries and pensions in the first half of 2012 (Korhonen, forthcoming: table on wages (statistically recorded), pensions, prices). When taking into account the timing of the most recent elections (parliamentary: December 2011, presidential: March 2012), the political cycle could possibly be of explanatory relevance for the lending boom.

2.1.3 Financial Deepening, Structural Catching-Up and Attractiveness of Highly Profitable Retail Lending

Financial deepening also plays a role: Supported by a wave of Russian consumer purchases of durable goods, retail lending appears to be on a structural catching-up path vis-à-vis peer countries (with approximately the same level of per capita GDP). Whereas total loans to households in 2012 corresponded to 12.4% of GDP in Russia, in Romania, for instance, a comparable level of this ratio had already been reached in 2006, and in Bulgaria a year earlier. Mortgage loans expanded in Russia from almost zero a couple of years ago, and, in 2012, made up slightly more than 3% of GDP, compared with no less than 20% that same year in Hungary, and 19% in Croatia. As retail lending has so far been very lucrative,[11] many credit institutions redirected resources to this activity to raise their profitability. But lending to enterprises has also continued to benefit from potential for expansion. Accordingly, low levels of personal and corporate indebtedness have created room for credit demand in Russia.[12]

2.1.4 Partial Funding Switch of Corporate Sector

As to corporate lending, whose contribution to the credit boom in absolute terms clearly exceeded that of retail lending, the heightened risk aversion in international capital markets following the 2008–2009 downturn prompted the corporate sector to partially, and temporarily, switch from external to domestic bank funding (IMF, 2012, p. 6; Oura, 2012, p. 37).

2.2 Supply-Side Factors
2.2.1 "Deposit Boom," Increasing Profits and Generous Official Liquidity Assistance

Russian banks' balance sheets benefited from strong deposit growth due to repeated sizeable income hikes and, at least in the second half of 2011 and the first half of 2012, increases in nominal and/or real deposit rates. The four quarters reflecting the strongest lending growth (from mid-2011 to mid-2012) also account for the most dynamic deposit growth, which under-

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[11] *According to the CBR, banks above a minimum size and specializing in retail lending (credit volume > RUB 5 billion, credit to households/assets > 40%, interest income from consumer loans/interest income > 50%) feature a much higher return on assets (end-March 2013: 5.7%) than the sector on average (2.1%) (CBR, 2013b, p. 37).*

[12] *Due to the predominant focus on credit and lending, financial deepening is here understood primarily as a demand-side factor; however, financial deepening is obviously also related to the rising number of bank accounts and thus can equally be perceived as a supply-side factor (see also "deposit boom" below).*

Russia: Selected Banking Sector Stability Indicators (2009–13)

	End-2009	End-2010	End-2011	End-2012	September 30, 2013
Credit risk	%				
Total loans (excl. interbank loans, ratio to GDP)[1]	42.1	39.7	42.4	45.1	46.1 (end-June)
Annual real growth	–10.0	+3.5	+21.0	+12.1	+11.3
Loans to households (share in total loans)	21.9	22.1	23.5	27.4	29.5
Annual real growth	–18.2	+5.1	+28.1	+30.8	+23.5
Mortgage loans (share in loans to households)	28.3	27.6	26.6	25.8	25.8 (end-May)
Nonperforming loans (share in total loans incl. interbank loans, narrow definition)[2]	9.7	8.3	6.8	6.3	6.6
Nonperforming loans (share in total loans, incl. interbank loans, broader definition)[3]	19.5	19.7	17.2	15.4	15.1
Ratio of large credit risks to total banking sector assets[4]	23.1	25.8	28.8	25.8	25.2 (end-May)
Market and exchange rate risk					
Foreign currency loans (share in total loans)	23.4	21.8	20.2	16.3	16.5
Foreign currency loans to households (share in loans to households)	11.3	8.8	5.8	3.2	2.7
Foreign currency deposits (share in total deposits)	32.8	27.7	24.9	25.2	26.3
Deposit rate, households[5]	8.6	6.0	4.4	5.5	6.0 (end-May)
Deposit rate, enterprises[5]	..	..	3.6	5.3	5.6 (end-May)
Lending rate, households[6]	..	..	23.8	24.5	24.6 (end-May)
Lending rate, enterprises[6]	15.3	10.8	8.5	9.1	9.7 (end-May)
Liquidity risk					
Total deposits (excl. interbank deposits, ratio to GDP)[7]	33.4	34.2	36.3	38.1	39.7 (end-June)
Annual real growth	+9.7	+12.5	+20.3	+10.6	+15.2
Loan-to-deposit ratio	126.2	116.1	116.8	118.3	118.8
Ratio of highly liquid assets to total assets	13.3	13.5	11.8	11.1	11.7 (end-June)
Banks' external assets (share in total assets)[8]	14.2	13.4	14.3	13.0	13.7
Banks' external liabilities (share in total liabilities)[9]	11.9	11.7	11.1	10.8	10.5
Liabilities to the CBR (share in banks' total liabilities)[10]	4.8	1.0	2.9	5.4	5.8
Profitability					
Return on assets	0.7	1.9	2.4	2.3	2.0
Return on equity	4.9	12.5	17.6	18.2	16.1
Shock-absorbing factors					
Capital adequacy ratio (capital to risk-weighted assets)	20.9	18.1	14.7	13.7	13.4
Loan loss provisions (ratio to total loans)	9.1	8.5	6.9	6.1	6.1
Claims on the CBR (share in banks' total assets)[11]	6.0	5.4	4.2	4.4	3.5
Memorandum items					
Total banking sector assets (ratio to GDP)	75.8	73.0	74.6	79.1	80.2 (end-June)
Share of majority state-owned banks in banks' total assets	43.9	45.9	50.2	50.4	..
Share of majority foreign-owned banks in banks' total assets	18.3	18.0	16.9	17.8	14.7
EBRD index of banking sector reform	3–	3–	3–	3–	..
International reserves of the CBR (incl. gold, ratio to GDP)	34.2	31.5	28.8	26.1	25.6 (end-June)

Source: Bank of Russia, author's calculations.

[1] *Loans and other placements with nonfinancial organizations, government agencies and individuals.*
[2] *Share of problem loans (category IV) and bad loans (category V) according to CBR regulation no. 254 (2004).*
[3] *Share of doubtful (category III), problem (category IV) and bad loans (category V) according to CBR regulation no. 254 (2004).*
[4] *Large credit risks refer to borrowers holding loans in excess of 5% of regulatory capital.*
[5] *Weighted average rate on ruble deposits with credit institutions for a term of up to one year.*
[6] *Weighted average rate on ruble loans with a maturity of up to one year.*
[7] *Deposits and other funds of nonfinancial organizations, government agencies and individuals.*
[8] *Funds placed with nonresidents, incl. loans and deposits, correspondent accounts with banks, securities acquired.*
[9] *Funds raised from nonresidents, incl. loans from foreign banks, deposits of legal entities and individuals.*
[10] *Loans, deposits and other funds received by credit institutions from the CBR.*
[11] *Accounts with the CBR and authorized agencies of other countries.*

lines the pivotal importance of increased deposit funds for financing the credit boom. Furthermore, banks' net liabilities to the monetary authority and to government agencies rose during this period (from below zero to 2%–3% of GDP), pointing to the additional factor of CBR and government liquidity assistance that supported the lending boom in its most dynamic phase (from the second half of 2011).

2.2.2 Large State-Owned Banks in the Forefront of Lending Expansion

Large majority state-owned banks' (SOBs') lending activity has been in the forefront of the credit boom. In light of their generally big size[13] and extensive networks, their strengthened post-crisis market positions (after they had taken over failed private banks in 2008–2009), their favorable access to funding and the possibility of being price setters on the domestic deposit and loan markets, SOBs have had the means to be particularly assertive in lending expansion. Overall, SOBs increased their market share in sector assets from 44% at end-2009 to 50% at end-2012 (see table 1). Sberbank, Russia's state-owned market leader, has been one of the "locomotives" of the consumer credit boom and expanded its retail lending by 34% (in real terms) in 2012 (Neue Zürcher Zeitung, 2013b).

Foreign Banks' Modest Withdrawal from Russia Has Not Thwarted the Credit Boom

A factor that has not been driving the credit boom, yet removed a possible impediment to it, was the rather small market shares of euro area banks compared with their presence in other CESEE countries. This smaller presence reduced Russian exposure to possible deleveraging actions. Also, as a net external creditor for some years now, the Russian banking sector has become more resistant to deleveraging. Majority foreign-owned banks' (FOBs') share in total loans (excluding interbank loans) slightly declined from 2010 to 2013 (from 17.1% at end-2009 to 16.6% at end-May 2013). The contraction of FOBs' share in retail loans was slightly more pronounced (from 25.1% to 22.4%) than that in loans to enterprises (from 14.8% to 14.2%). Thus, FOBs on average participated in the (retail) credit boom, but on a disproportionately smaller scale.

Still, a number of foreign banks withdrew from the Russian market, which was only partly motivated by problems they experienced in home markets or by regulatory tightening at home. Also, some of the foreign banks with the greatest experience and the strongest presence in Russia did not curtail their activities.

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[13] *The four biggest Russian banks, measured by assets, are majority state owned and account for slightly less than half of total sector assets: Sberbank (over one quarter of sector assets at end-2012), Vneshtorgbank (VTB, including the Bank of Moscow acquired in 2011), Gazprombank, and Rosselkhozbank (Russian Agricultural Bank).*

Table 1

Recent Withdrawals of Foreign-Owned Banks from the Russian Retail Banking Market, 2010–13

Foreign-owned bank (parent bank)	Country of origin	When established in Russia	When left Russia/ discontinued retail operations or announced intention to do so	Reason for leaving/ winding down retail operations	Acquiring or negotiating investor
Santander Consumer Bank (Banco Santander)	Spain	2006	Dec. 2010 (carried out)	Cost cutting; stiffer competition from large Russian SOBs	Orient Express Bank (private Russian bank)
Swedbank	Sweden	2005	July 2010 (announced)	Refocusing on core markets; stiffer competition in Russia; cost cutting	Raiffeisen Bank International (RBI)
Rabo Invest (Rabobank)	Netherlands	1997 (representative office)	Feb. 2011 (carried out)	Refocusing on core investments	No investor; cancelation of Rabo Invest's banking license by CBR
BNP Paribas	France	2006	Sep. 2012 (carried out)	Efficiency adjustments	Sberbank (establishment of consumer finance joint venture "Cetelem"; ownership: 70% Sberbank, 30% BNP Paribas)
HSBC Russia	United Kingdom	2009	Late 2011 (carried out)	Stiffer competition from large Russian SOBs (notably Sberbank, VTB) and more established FOBs; cost cutting; problems in parent bank's home market	Citigroup Russia
Barclays Russia	United Kingdom	2008	Oct. 2011 (carried out)	Impact of Great Recession on Barclays' business in Russia; stiffer competition from large Russian SOBs; cost cutting	Group of investors incl. Igor Kim (Russian banker)
Handels-banken	Sweden	2005	June 2012 (announced)	Stiffer competition from large Russian SOBs	No investor; request to CBR to cancel Handelsbanken banking license
Promsviaz-bank (Commerz-bank: minority shareholder)	Germany	2006	June 2012 (carried out)	Parent bank's sell-off of nonstrategic assets to cover capital needs	Promsviaz Capital B.V. (majority owners of Promsviazbank: Alexey and Dimitry Ananiev/Russian businessmen)
Absolut Bank (KBC)	Belgium	2007	Aug. 2012 (announced)	Parent bank's realization of restructuring/ deleveraging plans and requirements; refocusing on core markets	Blagosostoyanie (pension fund of Russian Railroads)

Source: Author's compilation.

As the above table shows, banks that left Russia recently (as from 2010) had arrived relatively late. Well-established banks like Société Générale (Rosbank), Raiffeisen, UniCredit, Citigroup or OTP stayed on.[1] The most important reasons for leaving cited in the press were: increased competition,[2] notably from Russian SOBs, cost cutting and efficiency-enhancing measures, and a refocusing on core markets and investments (i.e. in the home country). The most important investors taking over leaving banks' Russian operations have been Russian private or state-owned banks (like Orient Express Bank in the case of Santander Consumer Bank or Sberbank in the case of the majority takeover of BNP Paribas Russia) and well-established FOBs (like Raiffeisen Bank International, which acquired Swedbank Russia). The fact that some of the largest and most dedicated FOBs in the country participated in the takeover of less fortunate foreign-owned competitors underlines the assessment that overall FOB divestment is but modest in Russia. In a credit boom environment, this is not surprising.

[1] *The "troika" of big foreign-owned lenders in Russia (Société Générale, UniCredit and Raiffeisen) has remained among the top ten credit institutions (in terms of assets) of the country, although the combined market share of the "troika" has shrunk somewhat from about 5.7% at end-2009 to 4.6% at end-2012 (Raiffeisen Research, 2013, p. 55).*

[2] *This corresponds to findings that higher competition can lead to higher failure of banks, as shown in Fungáčová and Weill (2013).*

3 Risks Related to the Credit Boom

The main risks associated with the credit boom are partly long standing and partly newly emerging. Surging unsecured retail lending is a relatively new phenomenon, while widespread connected lending in the corporate sector is a familiar problem in Russia. The same goes for elevated levels of NPLs, which may, however, swiftly rise if the consumer credit boom derails.

3.1 Surging Unsecured Consumer Lending

Although the share of retail credit is still relatively modest in Russia compared with peers, not only does the consumer credit boom remain strong, but it has also been substantially driven by unsecured products such as direct cash loans, credit card loans, and point of sales loans (loans granted for the acquisition of durable goods directly at the store where the purchase occurs). As a result of aggressive expansion, uncollateralized consumer loans increased by about 44% in real terms in 2012 and accounted for no less than 60% of total household loans at the end of that year (CBR, 2013c, p. 34; BOFIT Weekly, 2013a).[14] At end-September 2013, the growth rate (real, year on year) of uncollateralized retail loans had substantially declined, but stood at a still perky 27%. This lifted the share of these loans in total household loans to 62.5% (Sosyurko, 2013). Given such rapid expansion, one may doubt the capacity of banks to reliably verify the quality of the numerous incoming credit applications.[15] Meanwhile, mortgage lending only comprises about a quarter of total retail credit, which also distinguishes Russia from a number of other coun-

[14] *Direct cash loans reportedly grew by 31% and credit card loans by 50% (in real terms) in the twelve months to end-June 2013 (Serafimovich, 2013).*

[15] *In order to boost efficiency, cut costs, and raise market shares, some Russian banks have automated loan decisions, e.g. for car purchases (using, inter alia, social media-supported data-driven models) (Alexander, 2013, pp. 70–71). Proof of such strategies' efficiency is certainly not attainable over a couple of boom years and will probably have to await the passing of the business cycle.*

tries.[16] Mortgage loans have since mid-2010 expanded at around the same pace as total consumer credit and as yet do not constitute a sizeable risk factor.

While Russian households' overall liabilities do not give rise to concern and fewer than one in five Russians owns a credit card, there is certainly a group of households particularly vulnerable to overindebtedness, namely younger people and families with high material needs and yet little financial experience (O'Neill, 2013, p. 80; Ekonomika i Zhizn, 2013). In the first half of 2013, Russian households that had taken out credits spent on average over one-fifth of their income on servicing debt, which is a higher share than that paid by Turkish or some European consumer-borrowers (Aris, 2013; Sosyurko, 2013). Moreover, Russian households' income is not growing as fast as their debt. A large amount of retail credit is short term with rather high interest rates; in 2012, the average annual rate for short-term retail loans equaled 25%.

This very high interest rate level goes a long way in explaining why Russian households' interest burden in relation to GDP slightly exceeds the comparable euro area indicator despite the fact that the euro area households' debt-to-GDP ratio dwarfs Russia's (Ponomarenko, 2013). On top of this, no less than 30% of Russian household borrowers have reportedly taken out three or more loans (Noskova, 2013; Vasileva, 2013). As at end-March 2013, the NPL ratio (narrow definition) for

household loans (6.9%) was even somewhat higher than the respective ratio for total loans (6.5%) (CBR, 2013c, p. 36). This was the case despite the more recent and very fast buildup of the household loan portfolio, which would have suggested a lower retail NPL ratio. This, in turn, may give rise to concern.[17] With the ongoing slowdown of retail lending growth, a further, possibly substantial increase of the household NPL ratio may be expected.

Some of the most dynamic participants of the retail credit and unsecured lending boom are Sberbank, Vneshtorgbank (VTB, which opened a mass-market bank called Leto[18] Bank) and several other large banks, including Russia's biggest privately owned credit institution, Alfabank, as well as a number of specialized small to medium-sized private banks (e.g. the Home Credit Group, majority controlled by a Czech businessman; Tinkoff Credit Systems, a credit card specialist partly owned by Goldman Sachs; and Renaissance Credit, recently bought by the Russian businessman Prokhorov).

3.2 Widespread Connected Lending in the Corporate Sector

While the surge of consumer lending and related risks have most recently become the focus of attention, connected lending remains a long-standing and costly problem in Russia (as well as in some other countries). Connected or related-party lending refers to loans extended to banks' owners or managers and/or to their related businesses

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[16] For instance, mortgage lending makes up an average of 2/3 to 3/4 of total EU household credit. The difference can be attributed, inter alia, to two causes: First, real estate is much more expensive in Russia (in relation to per capita GDP) than on average in the EU; and, second, about 80% of Russians – as opposed to a much smaller average share of Europeans – tend to own their dwellings (since the post-Soviet privatization of apartments in the 1990s) (Orlova, 2012, p. 77).

[17] Overdue consumer loans have surged from 2012, and the volume of new retail credit used to repay previous debt has equally been on the rise (Fedotkin, 2013; Yalovskaya et al., 2013, p. 7).

[18] Meaning "summer."

(OECD Proceedings, 1998, p. 256). According to expert estimates, about 10%, in some cases up to between 25% and 30% of Russian banks' loan portfolios are made up of loans to related parties, which may be concealed through specific schemes like holding companies (Orlova, 2012, p. 76).[19] High single-party concentrations are another indicator of possible related-party lending: As shown in table 1, in recent years the ratio of large credit risks (i.e. borrowers whose loans exceed 5% of regulatory capital) to total banking sector assets has exceeded one quarter.[20] Connected lending is facilitated if the credit institution in question actually operates like a "pocket bank," i.e. an extended financial department or treasury of one or a small number of owner firms (OECD Proceedings, 1998, p. 255).

It was not repercussions of the Great Recession or of the business cycle, but excessive connected lending, entrenched pocket banking and weak corporate governance that seem to have been largely responsible for the insolvencies of Mezhprombank (International Industrial Bank, a mid-sized private credit institution) in 2010 and of the Bank of Moscow (Bank Moskvy, majority owned by the Moscow municipality and, at end-2010, the fifth-largest credit institution of the country) in 2011 (Hosp, 2011). After former Russian president Medvedev had dismissed the Moscow mayor Luzhkov in 2010, the majority government-owned

VTB launched a hostile bid and took over about half of the Bank of Moscow, fired its management and eventually detected that about EUR 7 billion or around 30% of the institution's credit volume was "bad." The Bank of Moscow had reportedly been able to disguise the true quality of these delinquent assets by using special purpose vehicles (SPVs) often located in offshore jurisdictions, many of which were affiliated with previous managers. According to its own account, the bank's former management had extended loans of EUR 5.4 billion to "entities linked to the bank"; management had, inter alia, carried out real estate projects which gave rise to allegations of fraudulent lending at below market rates without sufficient collateral (Mauldin, 2011).

In order to bail out the Bank of Moscow, the largest bank rescue package of Russian and CESEE history was assembled, providing for an injection of funds of EUR 9.8 billion: About two-thirds of the bailout sum were financed by a low-interest CBR loan (disbursed via payments through the Deposit Insurance Agency); VTB contributed about a quarter of the amount by raising its share in the Bank of Moscow's capital to 75%.[21] The dimension of the distress that had suddenly erupted around the Bank of Moscow raised questions about CBR oversight of the sector. While the central bank still seems to lack sufficient authority to effectively address connected lending,

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[19] *In 2012, a high-ranking CBR official visiting the OeNB in Vienna put it this way: There are still many Russian banks whose principal beneficial owner is also their principal borrower, and this remains a serious supervisory problem.*

[20] *However, related-party lending is not the only likely explanatory factor for high single-borrower ratios. The latter also reflect the concentrated structure of the Russian economy, which is dominated by certain industries with rather few large companies holding sway over the respective markets (Yalovskaya et al., 2012, p. 12).*

[21] *While raising VTB's market shares with respect to loans and deposits, the takeover of the Bank of Moscow increased the acquiring credit institution's capital needs. In May 2013, VTB issued shares on the Moscow Exchange. The majority owner, the state, did not participate in the share issue, which reduced the state's interest from 76% to 61% and increased the bank's capital by about EUR 2.5 billion. Among the largest investors were the sovereign funds of Qatar, Norway and Azerbaijan.*

some progress has been made recently in upgrading the supervisory framework in this direction: Legislative amendments have enhanced the CBR's authority over bank holding companies and related parties. Professional judgment can now be used (to a greater degree than before) in applying laws and regulations to individual banks (IMF, 2012, p. 28; IMF, 2013, p. 3). Nevertheless, one cannot exclude the possibility that connected lending-triggered banking turmoil reappears sooner or later.

3.3 Still Elevated Levels of Nonperforming Loans, Modest Provisioning

Although they have been declining during the credit boom of recent years, NPL ratios (nonperforming loans to total loans including interbank loans) remain at relatively high levels (narrow definition: 7%, broader definition: 15%) in Russia. From mid-2010 to end-September 2013, NPLs in real terms increased by about 5% (narrow definition) or around 15% (broad definition). Therefore, one can conclude that banks in fact did not use the boom years to reduce bad loans, but that NPL ratios only declined due to swiftly growing credit volumes. In this situation a later increase of NPL ratios is not precluded and is even probable once portfolios season and repayment obligations mount. Also, the current slowdown of the economy as well as of lending may entail an eventual increase of NPLs. At least for purposes of international comparison, the broader definition of NPLs (comprising the shares of doubtful, problem and bad loans, see footnote 8 above and chart 3 below) is more adequate, as explained in Barisitz (2011, pp. 52–53) and Barisitz (2013, p. 70). If one chooses the broader definition, only less than half of impaired loans are covered by loan loss provisions, i.e. Russian banks' provisioning is insufficient by a considerable margin.

Moreover, NPLs are potentially underreported. For instance, restructured loans, which account for around one-third of all large loans, are often of doubtful quality (Jafarov, 2013, p. 32). "Evergreening" (the repeated restructuring or rolling-over of loans of delinquent or troubled borrowers) seems to be widespread (Bugie et al., 2012).[22] The same goes for the practice of transferring distressed assets to affiliated off-balance sheet entities not subject to consolidated supervision. Furthermore, the indicated level of provisions may actually be misleading due to a wide variation of collateral quality (Oura, 2012, pp. 38–40). As can be easily inferred from the above subsection, connected lending can raise the risk of loans turning nonperforming because related parties tend to be less strictly vetted when applying for a loan and their offered collateral tends to be weaker (Hosp, 2011).[23] Like in a number of other CESEE countries, incentives may not be sufficient for in-depth NPL resolution/workouts, more specifically legal/judicial obstacles to the enforcement of collateral are likely to persist.

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[22] *Evergreening may be a strategy by banks to circumvent the inefficiently functioning judicial system to seek repayment. In this sense, credit institutions may be betting on better times and trying to "grow" their way out of trouble (O'Neill, 2012, p. 103).*

[23] *On the other hand, group-internal social pressure for respecting one's obligations may be higher (as long as the group of related parties remains intact).*

Chart 3

Russia: Credit Quality

*Outstanding credit volume incl. interbank loans
in % of GDP (structured in credit quality categories)*

NPL ratio in % (NPLs to total loans)

Bad · Problem · Doubtful · Substandard
Standard · NPL ratio (right-hand scale) · Defined here as NPL threshold
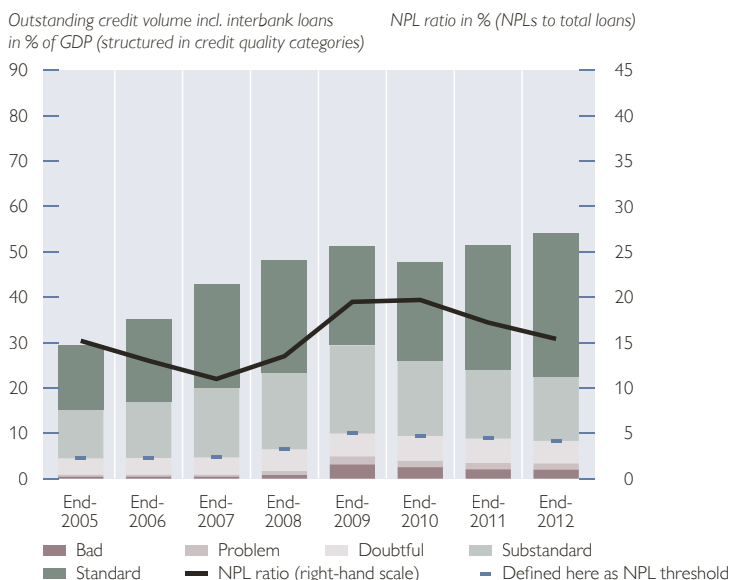
Source: Bank of Russia, Rosstat.

4 The CBR's Policy Reaction to the Credit Boom and Reasons for the Most Recent Slowdown of Lending Growth

The monetary authority reacted, from 2012 onward, to the lending boom and resorted to some credit growth containment measures (following the CBR's and the government's probable contribution to swift loan growth through above-mentioned liquidity-enhancing measures). After the monetary authority had – from the spring of 2012 – repeatedly expressed its concern about the rapid expansion of retail lending, CBR officials in late 2012 met the heads of some of the biggest retail lenders and requested that consumer credit growth not exceed 30% (in nominal terms) in 2013.

– This moral suasion initiative was followed in early 2013 by some prudential measures:
– The doubling of minimal loan loss provisioning requirements for unsecured consumer loans, without overdue payments or with payments overdue less than 30 days, extended after January 1, 2013;
– the establishment of a new minimal amount of 100% reserves for unsecured retail loans whose repayment is more than 360 days overdue; the requirements entered into force on March 1, 2013;
– the increase of coefficients for the calculation of capital adequacy for unsecured consumer loans extended after July 1, 2013 (CBR, 2013a, p. 103; CBR, 2013d, p. 65).

The CBR also warned that banks that expand lending too aggressively may face sanctions. In response, some of the country's biggest retail-focused lenders declared their intention to comply with the regulator's demand and to rein in lending growth for 2013 (Weaver, 2013a; Triebe, 2013a)[24]. If necessary, as pointed out by officials, the CBR might set a maximum interest rate level for retail loans or limit the maximum share of income that a borrower is required to pay on debt (Russia & CIS Banking and Finance Weekly, 2013, p. 24; Weaver, 2013b).

While influenced by the CBR's policy reaction and credit containment measures, which probably started to have an impact in early 2013, lending growth was already slowing down from mid-2012.[25] This deceleration was likely to have been triggered by the general economic slowdown that had set in in the second quarter of 2012. In recent months,

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[24] *At end-July 2013, nominal retail lending growth (year on year) still came to 34%.*

[25] *Declining fixed investment, large-scale destocking, a disappointing external economic outlook, and stagnating and lately even declining oil, gas and metals prices (see chart 2) contributed to the general slowdown.*

the onerous terms of many consumer loans (including short repayment periods and steep interest rate changes) probably contributed to rising loan losses and thus dissuaded some potential borrowers from taking out loans.[26]

Macroeconomic model-based stress tests of the banking sector conducted by the CBR and published in July 2013 provide for two scenarios, dependent on the degree of potential deterioration of the global economy and the oil price: a pessimistic and an extreme scenario. The first scenario, inter alia, provides for a drop of the oil price of 25%–30%, triggering a decline of Russian GDP growth to 1.2%.[27] The second scenario depicts a severe recession (GDP: −5.0%). In the pessimistic case, the banking sector's losses could amount to 25% of total sector capital; in the extreme case, this ratio could reach 42%. Operating profits of the sector (after deduction of above losses) would come to RUB 600 billion to RUB 700 billion and RUB 100 billion to RUB 150 billion, respectively. Capital adequacy in the pessimistic scenario would decline to 11.1%, in the extreme scenario to 10.6%. This, the CBR points out, implies that the Russian banking sector is able to withstand a serious shock in the case of a crisis (CBR, 2013c, pp. 38–39).

Box 2

Like the Russian Banking Sector in General, Austrian Banks in Russia Have Recently Recorded High Consumer Loan Growth Rates and Declining Capitalization Levels

David Liebeg[1]

Austrian banks were among the first banks to enter the Russian banking market. For Raiffeisen Bank International and UniCredit Bank Austria, their operations in Russia constitute a major share of their overall business, while their market share in Russia is relatively small (about 3% in mid-2013). DenizBank in Austria, whose parent bank was bought by Sberbank in 2012, also operates a small subsidiary in Russia.

In the first quarter of 2013, Austrian banks' (including foreign-owned banks') exposure in Russia made up 11% (EUR 39 billion in terms of ultimate risk exposure) of their total exposure in the CESEE and CIS region but accounted for more than one-third of the profits generated in the region. As a case in point, their combined RoA in Russia ran to no less than 3.1% in the first quarter of 2013.

In comparison to the overall region, Austrian banks' subsidiaries in Russia also exhibit a high degree of operational efficiency (reflected by a cost-income ratio of 36% in the first quarter of 2013), a relatively low relevance of foreign currency lending (with a share of 9% for household loans and of 55% for corporate loans, where the latter has to be seen from the perspective of a generally highly dollarized corporate sector in Russia), and low nonperforming loan (NPL) and loan loss provisioning (LLP) ratios (4.9% and 3.8%, respectively, as at end-2012), which have been continuously declining since mid-2010.

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[26] *The above-mentioned substantial slowdown in lending to enterprises may not reflect a supply problem, as one might infer. According to a poll by the Gaidar Institute for Economic Policy in late January 2013, 56% of the firms questioned (which is more than at any time in the past 18 years) responded that their investments were sufficient. Only 11% indicated difficulties with accessing credit, and 13% pointed to overcapacities giving rise to concern (Neue Zürcher Zeitung, 2013a; see also the assessment in IMF, 2013, p. 4).*

[27] *As of October 2013, this scenario does not appear very far fetched, at least with respect to weakening economic activity.*

Declining NPL and LLP ratios are, however, a natural consequence of the high growth rates of loans to nonbank borrowers, which peaked at +19% year on year in real terms (+23% nominal) in the first quarter of 2012, but fell to +5% in real terms (+12% nominal) in the first quarter of 2013. Growth rates of consumer loans (+32% year on year in real, +41% in nominal terms as at end-2012) exceeded these figures and exhibited dynamics similar to those of the aggregate Russian banking sector. Still, Austrian banks' assets continue to be dominated by corporate loans (EUR 16.5 billion vs. EUR 6.0 billion in household loans as at end-2012). Nonbank deposits grew at a similar pace as loans, leading to a general decline of the combined loan-to-deposit ratio from more than 140% at the end of 2008 to less than 100% at end-2011. However, by March 31, 2013, it had increased again to 109%.

Another similarity to the aggregate Russian banking sector is the decline (albeit at a slower pace) in capital levels recorded by Austrian banks. While the combined capital adequacy ratio of Austrian subsidiaries stood at 16.8% at the end of 2010, it dropped by 3 percentage points in the course of two years (to 13.8% at the end of 2012).

Peer-country comparisons of levels in indebtedness and private sector loans as a percentage of GDP still signal further room for financial deepening. However, the high growth rates in the consumer lending sector in combination with a deteriorating capital base also warrant caution for future growth in Russia. Moreover, these developments reveal the need to shore up risk-bearing capacities as well as to make sure adequate risk management systems are in place to cope with such a high rate of expansion.

5 Other Substantial, if Partly Eroding Shock-Absorbing Factors, Including Capital, Profits, Provisions, Deposits and External Claims

Shock-absorbing factors are important, but some have been weakening over the last couple of years: As mentioned above, capital adequacy, while still at a fair level, declined from mid-2010 to end-September 2013 by more than five percentage points. Profits recovered, but are substantially lower than before 2008. Depending on the NPL definition, loan loss provisions are hardly sufficient or plainly insufficient. Credit institutions' net claims on the CBR spiked at end-2010 at 3.2% of GDP, in 2012 turned negative and, at end-June 2013, came to –1.1% of GDP. The liquidity ratio (ratio of highly liquid assets to total assets) also gradually receded, before slightly rising again, as table 1 shows.

Still, as mentioned above, the deposit boom was even somewhat stronger overall than the credit boom and the loan-to-deposit ratio is now (119%)

much lower than in the years preceding the crisis of 2008–2009 (e.g. 2007: 143%). Depositor confidence continues to be high. At about one-quarter, the share of foreign currency-denominated deposits in total deposits is smaller than it is in many peers. The share of foreign currency loans in total loans has declined to about one-sixth, and to a negligible level in the case of household loans – largely freeing Russian retail borrowers from foreign exchange risks, which are quite present in a number of other countries. Credit institutions' external assets, which were built up in the post-crisis years, are almost one-third higher than their external liabilities.

The CBR as well as the government maintain considerable room for maneuver. The enhanced flexibility of the monetary authority's exchange rate policy reduces potential policy conflicts with ensuring financial stability. While the government has lately rebalanced its budget, the Russian state's debt remains very low at about 10.5% of GDP (end-2012). And gross international reserves (including gold) remain

ample (EUR 388 billion at end-October 2013), if steadily declining as a ratio to GDP (mid-2010: 34.1%, end-June 2013: 25.6%). An institution that should add to the availability of information and transparency for lenders and in this way indirectly act as a shock-preventing factor is the National Bureau of Credit Histories (Natsion-alny biuro kreditnykh istorii or NBKI), which is owned by a number of Russian banks and is the biggest of a couple of dozen credit reporting agencies active in the country.[28] Finally, one could refer to the overall relatively low point of departure of the Russian credit boom and to the still modest size of consumer lending as a cushioning factor. In other words, the country remains structurally "underbanked" in this respect.

6 Outlook

Apart from the considerable but latent risk of another large bank unexpectedly succumbing to problems with related-party lending, most interest is currently focused on risks linked to the Russian credit boom. As mentioned above, since the second half of 2012 loan growth has been decelerating and the credit boom has been "landing." So far, it has been a "soft landing," which has already progressed relatively far with respect to enterprise loans and the total credit volume (the latter: +11.3% at end-September 2013 in real terms), but not yet that far in the field of retail lending, notably unsecured loans (the latter: still +30% at end-June 2013).

Given the current domestic modest growth and weak but not dramatic global economic situation and given the CBR's intervention via moral suasion and prudential measures, the most probable outlook is a continuation of the soft landing, flanked by the still sizeable shock-absorbing instruments available to the authorities. Russia's introduction of Basel III in 2013 and 2014, respectively,[29] may accentuate the soft landing. Basel III is expected to provide for a tightening of risk weights and for a stricter definition of capital, which should entail a reduction of the sector's measured capital adequacy (possibly by 1%). This in turn may make it necessary for a number of banks to raise additional funds and withdraw potential resources from lending expansion (Wirtschaftsblatt, 2013; Triebe, 2013b). Alternatively, any reacceleration of consumer credit growth in the near term would have to be monitored very carefully and might give rise to concern with respect to eroding capital buffers and weakening financial stability.

Summing up: Swift Russian credit expansion has benefited from the strong recovery of the oil price and a robust upswing of domestic demand. Credit risks of connected lending in the corporate sector and in particular of surging unsecured consumer lending are most prominent. The recent economic slowdown as well as the CBR's prudential measures have contributed to an ongoing soft landing of the credit boom. While further improvement of risk management systems appear important, shock-absorbing factors remain sizeable.

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[28] As at April 1, 2013, the NBKI had gathered data on 115 million loans extended by more than 1,500 creditors (Sergeev, 2013, p. 3).

[29] The new requirements have formally come into force on April 1, 2013. Initially, capital and capital adequacy calculations in compliance with Basel III are made only for analytical purposes, while these indicators are to be used for regulatory purposes (including bank reports) as from January 1, 2014 (CBR, 2012, p. 26; BOFIT Weekly, 2013b).

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ARNIE in Action: The 2013 FSAP Stress Tests for the Austrian Banking System

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In this paper we present the main concepts and methods of the stress tests that the Oester-reichische Nationalbank conducted in 2013 in close cooperation with the IMF under the latter's Financial Sector Assessment Program (FSAP). We cover solvency and liquidity stress tests as well as, as part of our contagion analysis, the interaction of solvency with liquidity. The paper's objective is to contribute to the growing literature on applied stress testing by (i) sharing our methodological approaches, in particular innovations to cash flow-based liquidity stress testing, and by (ii) discussing the calibrations employed in what were the most extensive stress tests conducted for Austria in the past five years. Moreover we (iii) provide results at an aggregated level. The 2013 FSAP stress tests for Austria also mark the first public appearance of the OeNB's new systemic risk assessment tool, ARNIE ("Applied Risk, Network and Impact assessment Engine"). By covering recent methodological as well as operational progress, we also shed light on practical challenges. Finally, we identify the need for further work, in particular with regard to the interaction of solvency and liquidity stress testing, and contagion analysis more generally.

National financial sectors are periodically subjected to comprehensive and in-depth analyses under the IMF's Financial Sector Assessment Program. For Austria, the IMF conducted an initial FSAP in 2003 and FSAP updates in 2007 and 2013. In line with past usage[2] we herewith publish the main concepts and methods of the 2013 FSAP stress tests, which we carried out in collaboration with the IMF in spring 2013.[3] The stress tests are based on common macroeconomic scenarios (see section 1) and consist of three key building blocks: a solvency stress test (described in section 2), a liquidity stress test (section 3) and an analysis of contagion effects (section 4) resulting from the interaction of solvency with liquidity and from interbank exposures. Section 5 concludes. Note that the 2013 FSAP stress-testing exercise marks the first public appearance of ARNIE (Applied Risk, Network and Impact assessment Engine), the OeNB's new computational framework for systemic risk analysis (see box 1).

1 Macroeconomic Scenarios

The OeNB's 2013 FSAP solvency stress test was conducted on the basis of three macroeconomic scenarios: (i) a baseline scenario, (ii) an adverse scenario and (iii) an adverse scenario with add-ons for a number of countries, referred to as add-on scenario in the following.

1.1 Baseline Scenario

In line with recent OeNB stress-testing exercises, our baseline scenario reflects a combination of internal forecasts for Austria and selected Central, Eastern

Chart 1

**Annual GDP Growth 2013–2015
(Baseline and Add-on Scenario)**

%
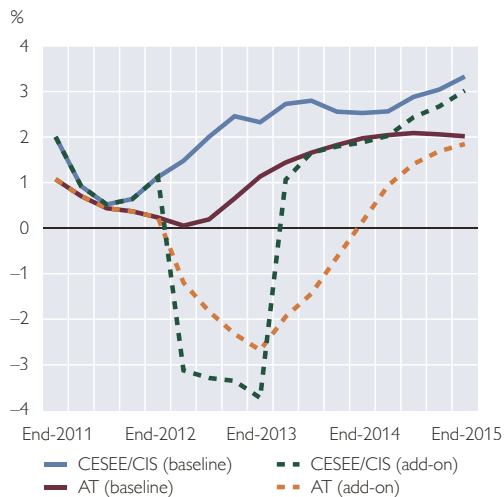
Source: IMF, OeNB.

Chart 2

**Cumulated GDP Growth 2013–2015
(Baseline and Add-on Scenario)**

%

Size of shocks in percentage points
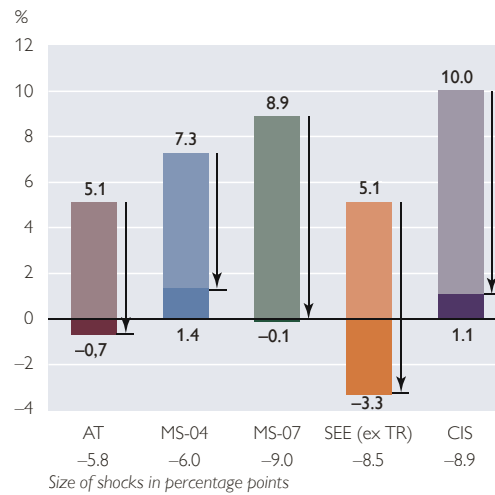
Source: IMF, OeNB.

and Southeastern European (CESEE) countries, as well as the IMF's World Economic Outlook (October 2012). Specifically, we use GDP rates forecast for Austria at the time of the FSAP and exposure-weighted[4] average growth rates for CESEE and CIS countries (chart 1). Over the three-year time horizon, we thus expect GDP to grow by slightly more than 5% in Austria, between 5% and 9% in the different CESEE subregions, and by as much as 10% in the CIS countries (chart 2).

1.2 Adverse Scenario

Despite substantial progress in solving the European sovereign debt crisis, the main downside risk in the short to medium run stems from major debt crisis-related downturns. Therefore the

adverse scenario is based on the assumption that the most distressed countries will not remain committed to continued fiscal and structural adjustment. A sudden drop in confidence is assumed to drive up interest rates and risk premia sharply. As government bond yields increase, European sovereigns run into refinancing problems, whereas banks see their core capital diminished on account of large write-downs of government bonds in their balance sheets. The fear of a collapse of large European financial institutions stresses sovereign bond markets further, creating a negative feedback loop between sovereign debt markets and financial institutions.

Consequently, rolling over old debt and obtaining new financing becomes increasingly difficult for all entities

[4] We agreed with the IMF to weight GDP aggregates by the exposure of Austrian banks, for instance to define scenario severity. Specifically, we used the following country aggregates: The eight EU Member States that joined the European Union in 2004 (MS-04): Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Poland (PL), Slovakia (SK) and Slovenia (SI); the two EU Member States that joined in 2007 (MS-07): Bulgaria (BG) and Romania (RO); the following countries in Southeastern Europe (SEE): Albania (AL), Bosnia and Herzegovina (BA), Croatia (HR), Kosovo (RK), the former Yugoslav Republic of Macedonia (MK), Montenegro (ME), Serbia (RS), Turkey (TR); and the Commonwealth of Independent States (CIS): Armenia (AM), Azerbaijan (AZ), Belarus (BY), Georgia (GE), Kazakhstan (KZ), Kyrgyzstan (KG), Moldova (MD), Russia (RU), Tajikistan (TJ), Turkmenistan (TM), Ukraine (UA), Uzbekistan (UZ).

with large funding requirements. Banks tighten their credit standards further and implement other supply-side restrictions to credit growth. The new European standards for capital ratios become even more binding. Depressed market sentiment leads to a further decline of valuations across asset classes. Lower equity prices trigger wealth effects in consumption and investment. European governments face an additional need for fiscal consolidation to regain the confidence of financial market participants. The shock leads to serious repercussions within the European economies, and the downturn is aggravated by feedback loops between the financial sector and the real economy and by feedback loops between financial market segments. All European countries are affected, albeit to varying degrees: The downturn is especially strong in many Southern and Southeastern European economies which are already characterized by high public debt levels, low competitiveness and weak growth prospects.

Moreover, the adverse scenario is based on the assumption that the protracted fiscal problems of the U.S.A. come to a head and lead to a sudden drop in confidence, hurting both domestic consumption and investment demand, on top of contracting foreign demand from Europe. The renewed confidence crises in Europe and the U.S.A. and the resulting demand shock cause euro area GDP and U.S. GDP to fall sharply and the 3-month EURIBOR-OIS spread to rise strongly in the first quarter of 2013. Our calibrations are driven by the standard deviations of historical quarterly year-on-year growth rates, which is broadly consistent with recent European FSAP stress-testing exercises.

This renewed stress in Europe and in the U.S.A. has global implications. In the OeNB's model for the Austrian economy, these shocks are transmitted through various channels, in particular confidence, fiscal, bank lending, interest rate, wealth and trade channels. For Austria, the adverse scenario thus results in a two-standard deviation shock to historical quarterly year-on-year growth rates at the end of the stress test horizon in Q4 2015.[5] At the same time, these shocks feed into the OeNB's GVAR (global vector autoregressive) model for emerging Europe (thoroughly documented in Feldkircher (2013)). For the CESEE/CIS subregions as weighted by the country-specific exposures of Austrian banks, the adverse scenario thus implies a deviation from baseline growth forecasts of roughly 1.5 standard deviations.

1.3 Add-on Scenario

In the add-on scenario, the overall shock to GDP growth is aggravated by additional country-specific shocks as a result of which the deviations from baseline growth forecasts are assumed to reach at least 1.5 standard deviations – i.e. the CESEE average of the adverse scenario – even in the major less-affected countries, namely Slovakia, the Czech Republic and Poland. Moreover, we assume that the downside risks are relatively more broad-based in several of those CESEE and CIS countries where Austrian banks hold significant exposures. Hence the add-on scenario is based on the assumption that the country-specific shocks for Hungary, Romania, Croatia and Ukraine are equivalent to at least 2.0 standard deviations.[6]

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[5] Based on observed historical data a shock of two standard deviations corresponds to a probability of approximately 2% to 3%.

[6] We treat all country-specific add-ons as idiosyncratic, without exerting contagion effects on other countries.

2 Solvency Stress Test

The macroeconomic solvency stress test we conducted under the Austrian FSAP 2013 to assess the resilience of single banks and the banking system as a whole to shocks to capital positions broadly follows international best practices (Schmieder et al., 2011; EBA, 2011). Our solvency stress test is mainly a top-down exercise based on supervisory data for all Austrian banks on a consolidated level, including foreign subsidiaries and their CESEE and CIS exposures. In addition, the top-down results are complemented by bottom-up tests for market risk carried out by the top-5 Austrian banks,[7] which represent about 60% of total bank assets.

For the purpose of the solvency stress test, we translated the three scenarios, as described in detail in section 1, into stressed risk parameters which we apply to individual banks' exposures in specific portfolios, countries and sectors, thus establishing losses under stressed conditions that would put pressure on the banks' capital positions. The following sections delve deeper into the methodology applied: we describe how we project profits, losses and risk-weighted assets. While the scenario-driven cyclical risks are the mainstay of each macro stress test, we also provide the background of how we account for other risk factors, which we capture by including multiple sensitivity analyses.

2.1 Scope of the Solvency Stress Test

The OeNB's solvency stress test is a top-down exercise with a three-year horizon covering the entire Austrian banking system on a consolidated level,

with supervisory as well as market and macroeconomic data for end-2012 serving as the starting point. We operate under a static-balance-sheet assumption where the total exposure remains constant over the stress horizon, i.e. we consider neither credit growth nor mitigating management actions.

To start with, we estimate cyclical credit risk by assessing additional losses and the reduced income-generating capacity of banks under duress in the individual scenarios. We conduct sensitivity analyses to establish the amount of additional losses that may result from (i) foreign currency lending (i.e. indirect credit risk following an appreciation of the foreign currency, in our case the Swiss franc), (ii) securitization positions, (iii) valuation losses on sovereign bond portfolios and (iv) market risk losses on trading book positions. For market risk losses, the aforementioned bottom-up approach enriches our assessment. Combining the traditional scenario-based losses with sensitivity analyses allows us to assess vulnerabilities from different angles.

2.2 Profit and Loss Projections over the Stress Horizon

To measure the resilience of the participating banks we project and analyze the evolution of several capital ratios[8] under the respective scenarios. For this purpose we need to model the evolution of the capital ratio components, namely the capital positions (the numerator) as well as risk-weighted assets (the denominator). While the calculation of risk-weighted assets follows the regulatory framework, calculating the capital positions requires assumptions about

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[7] BAWAG PSK, Erste Group Bank (EGB), Hypo Alpe Adria (HAA), Raiffeisen Zentralbank (RZB) and UniCredit Bank Austria (UCBA).

[8] Until the introduction of Basel III via the CRR/CRD IV, EBA's core tier 1 ratio (CT1R, see EBA (2011)), which was also used in the EU-wide stress test, remains the risk-bearing capacity measure of choice. Moreover, we calculate results for the tier 1 ratio (T1R) and the capital adequacy ratio (CAR).

future profits and losses, the net impact of which either improves or reduces the capital positions.[9]

Operating Result before Credit Risk

Operating profit is the first buffer with which banks may absorb potential losses and should therefore reflect the (relatively) stable income from banks' core business and exclude any extraordinary income or other one-off or valuation effects. In the solvency stress test we model two main components, (i) the initial profit base[10] and (ii) the profit path,[11] i.e. the relative decline of operating profit given a certain macroeconomic scenario.

Credit Risk Losses

To project credit risk losses, we follow an expected-loss approach that is common amongst supervisors. This approach involves estimating scenario-dependent stressed risk parameters (default probabilities and loss-given defaults – PDs and LGDs) which we apply to banks' exposures[12] in order to calculate a stressed expected-loss amount, which we assume to equal credit risk impair-

ments under stress. While the methodology for calculating stressed PDs is broadly unchanged and has been widely published,[13] we have recently refined the methodology to estimate stressed LGDs.[14]

Our stress tests are focused in particular on credit risk in CESEE and CIS. Not unlike the EU-wide stress-testing exercise, the Austrian models are estimated on a multi-country basis: Each CESEE or CIS country is modeled separately to assess the impact of national macroeconomic developments in the stress scenarios on the probabilities of default. See the following two charts for a comparison of the starting PD levels at end-2012 (chart 3) and PD peaks during the 2013–2015 stress horizon under the add-on scenario (chart 4).

Credit Risk-Weighted Assets

Apart from capital, which is influenced by the net result after tax and dividends, risk-weighted assets are the other main driver of the capital ratio. We account for the evolution of credit risk-weighted assets of IRB portfolios[15] using historical (realized) risk-weighted

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[9] We take account of tax effects as well as dividends in all three scenarios.

[10] For IFRS/FINREP reporters, we define operating profit as follows: Net interest income (including dividend income) + fee and commission income (net) + trading result + investments in associates + other operating result – administration costs – depreciations. For other banks, we use a similar definition based on the local GAAP accounting scheme. As operating profit usually exhibits some volatility, we use an exponential smoothing procedure based on quarterly data over the last five years to establish the stable income from banks' core business.

[11] The profit path models the reduced income generation capacity of banks under stress along two dimensions: On the one hand the operating result is reduced by defaulting exposures which no longer earn interest. On the other hand foreign income is reduced by foregone income due to unfavorable exchange rate movements for cross-border operations.

[12] We exclude (typically) nongranular portfolios from the calculation: sovereign exposures are accounted for in a separate sensitivity analysis and interbank exposures drive the contagion analysis results.

[13] See Kerbl and Sigmund (2011) for the current model.

[14] We estimate LGD using two inputs: (i) collateral information and (ii) an estimate of the LGD for the uncollateralized part of the exposure. We stress the two separately before computing the effective LGD. Real estate collateral is subjected to country-specific haircuts which we estimate for CESEE and CIS countries based on the historic GDP sensitivity of house prices. The LGD for the uncollateralized part is also country-specific and based on the 2012 edition of the World Bank's Doing Business statistics.

[15] Currently only credit risk-weighted assets for internal ratings-based portfolios are modeled endogenously. Portfolios in the standardized approach and other risk-weighted asset risk categories (e.g. market and operational risk) are kept constant. Risk-weighted assets for securitization exposures are considered separately in a sensitivity analysis.

Chart 3	Chart 4
Aggregate Probabilities of Default, End-2012	**Maximum Aggregate Probabilities of Default under the Add-on Scenario**
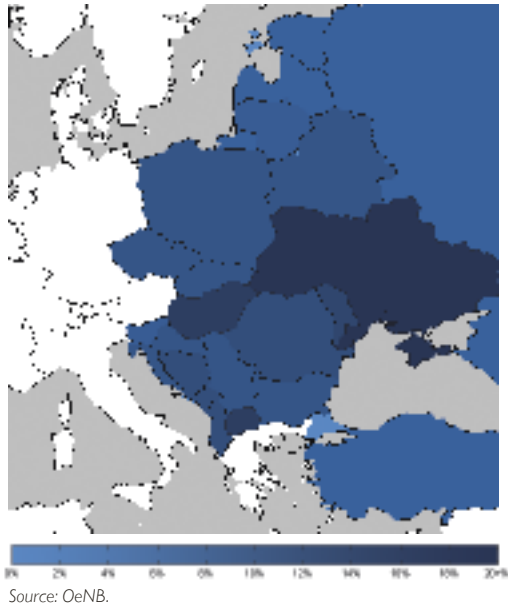
Source: OeNB.

Source: OeNB.

assets at the starting point and apply relative changes as reflected by stressed risk parameters according to the Basel II formula.[16] In order to match the respective regulatory approach of each individual bank/portfolio, we treat Foundation IRB and Advanced IRB portfolios separately. Furthermore, risk parameter shifts are smoothed over time to mimic the through-the-cycle nature of regulatory parameters as opposed to the point-in-time approach used for projecting credit risk losses.

2.3 Results of the Solvency Stress Test

Chart 5 shows that the aggregate Austrian banking system entered the latest OeNB stress test with a core tier 1 ratio of 10.6% at the end of 2012. In the baseline scenario, the banking system managed to improve this ratio to 11.7% by the end of 2015. In the adverse scenario, the core tier 1 ratio went

down to 9.8% by end-2015 and dropped to 8.9% under the add-on scenario. The result of the baseline scenario is mainly driven by (i) the profitability of the system – operating profit before risk exceeds credit risk provisions throughout the horizon of the baseline scenario. Moreover, (ii) the static-balance-sheet assumption leads to a reduction in risk-weighted assets (driven by IRB banks) of 9%.

The result under the assumptions of the adverse scenario is mainly driven by (i) a decline in operating profit before risk and (ii) an increase in credit risk provisions that peak at the end of 2013 (+57% from end-2012, substantially above historic highs even at the height of the financial crisis). The Austrian banking system rises from its trough in mid-2014 as measured by the core tier 1 ratio but without returning to the starting level by end-2015. The result of the add-on scenario is mainly driven

[16] See BCBS (2004, 2005).

Chart 5

EBA Core Tier 1 Ratio of the Austrian Banking System 2013–2015 (All Three Scenarios)
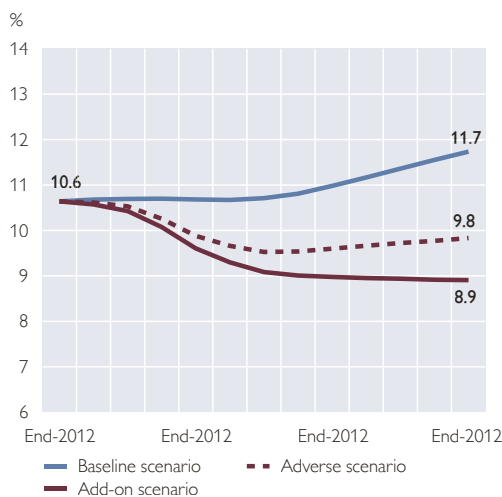
Source: OeNB.

by (i) a further decline in operating profit before risk and (ii) an increase in credit risk provisions that also peak at the end of 2013, albeit at significantly higher levels. Moreover, credit-risk weighted assets (of IRB banks) peak in mid-2014 with an increase of almost 10% from the initial end-2012 value. The impact at year-end 2015, however, is still negligible with +3%, not least due to the fact that IRB banks' performing portfolios decrease due to the

constant-balance-sheet assumption. Still, the additional blow to vulnerable CESEE and CIS economies takes its toll in particular on the largest Austrian banks. Nevertheless, the three internationally active banks remain comfortably above the thresholds agreed with the IMF.

At the same time, this rather benign aggregate outcome masks the significant dispersion of results we observe among the almost 600 consolidated Austrian banks included in the exercise. Besides the known problem banks, banks with low initial capitalization ratios and low historical profitability perform poorly. The latter are, however, mostly smaller banks, as chart 6 shows. While even under the most severe stress test scenario almost half of the consolidated Austrian banks remain in the group with a capitalization ratio above 14%, these banks constitute less than 10% of the Austrian banking system in terms of assets. At the other end of the distribution, a nonnegligible number of banks fail the stress test under the add-on scenario. Yet the assets of these banks – which are mostly the known problem banks – make up less than 7% of the entire banking system.

Overall, the solvency stress test results indicate an improvement of head-

Chart 6

EBA Core Tier 1 Ratio Pattern of the Austrian Banking System End-2015 (Add-on scenario)
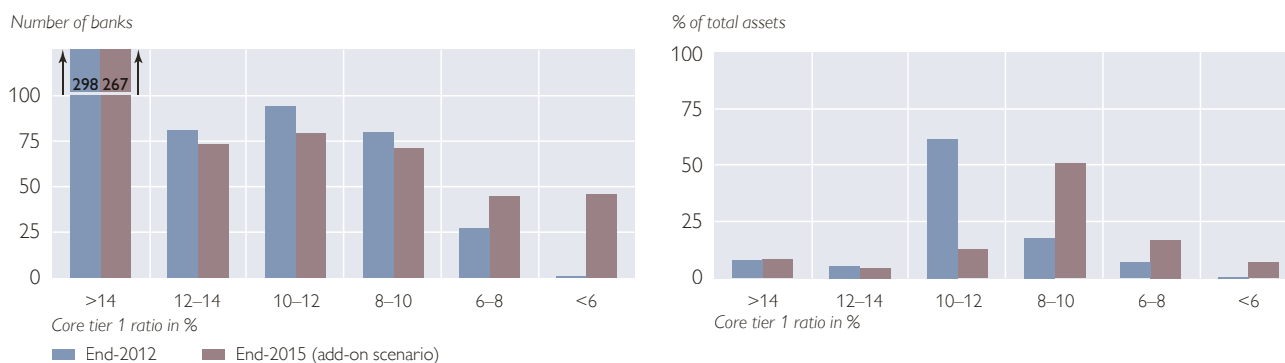
Source: OeNB.

line figures in line with international trends, but also the persistence of pockets of vulnerability in individual institutions as well as significant downside risks for the aggregate system. Amid the challenging European economic environment and the associated risks, Austrian banks should respond to the outside pressure emanating from regulators, supervisors, investors and rating agencies alike by strengthening their capital positions to improve their risk-bearing capacity.

Box 1

ARNIE, the OeNB's New Computational Framework for Systemic Risk Assessment[1]

The OeNB started to perform stress tests about a decade ago. Our first integrated tool – the Matlab-based Systemic Risk Monitor (SRM) – was put into operation in 2006. The SRM was a one-period model which accounted for market risk, credit risk and interbank contagion within a consistent framework. In order to address the longer time horizons required for solvency stress testing, we soon developed a second tool, which shared some components with the SRM but also used other data sources. However, it remained without a multi-period contagion mechanism. Over time, we implemented additional models in Matlab or added other Excel-based tools to generate exogenous input to the OeNB tools.

As the integration of various models became overly complex and burdensome the need to develop a new, integrated yet flexible tool arose. The result of this endeavor is ARNIE, the "Applied Risk, Network and Impact assessment Engine," which incorporates the OeNB's earlier developments and our experience with them but is based on a completely new code. While ARNIE can be used for stress testing it was conceived as a broader, bank-centric financial stability and impact assessment toolkit. This broader focus was driven – amongst others – by the recent rise to prominence of macroprudential regulation, as well as the abundance of policy-related questions with a view to the aggregate impact of the microprudential reregulation of banks. Hence, ARNIE does not only integrate and replace the existing tools to allow for traditional stress tests and network/contagion analysis, but in fact significantly broadens the horizon. It is based on the design principles of modularity, data abstraction, data aggregation and scalability.

Modularity: The modular design of ARNIE allows us to switch individual functionalities/modules on or off as needed and even to replace individual modules with others, depending on the current objective.

Data abstraction: Instead of directly importing data from the Austrian supervisory databases, ARNIE draws on a generic data pool which is populated from various data sources through separate data extraction functions. ARNIE itself uses only data from the data pool and is therefore completely shielded from reporting systems or other information infrastructures.

Data aggregation: ARNIE addresses an important tradeoff between data granularity and performance. Aggregation takes place at two points: Before calculations, ARNIE aggregates data from the data pool into customizable cubes. For example, credit risk data (exposure, collateral information and the risk parameters PD and LGD) are stored along six dimensions, which allows us to model shocks to specific countries and sectors and will, when implemented, allow us to model credit growth and rating migrations. When it comes to reporting, the data can be aggregated again for presentation purposes.

Scalability: ARNIE can handle very large amounts of data, from a single-digit number of banks to large banking populations such as the entire Austrian banking industry (about 600 consolidated banks) or even larger populations, without excessive burdens on resources. The tool (in fact, each module) can run in a consolidated or an unconsolidated mode, which allows us to produce a consolidated view of banking groups and assess the impact on specific subsidiaries.

[1] *Extensive ARNIE documentation is forthcoming in early to mid-2014 and is available on request.*

With regard to stress testing, ARNIE was designed to run traditional point forecast-type calculations as well as Monte Carlo simulations. For macroeconomic stress tests, we typically design two to three scenarios, which are then translated into risk parameter shifts. For Monte Carlo simulations, we process a multitude of automatically generated scenarios to arrive at a distribution of results which will include more extreme realizations and provide the impact of tail events. To generate such scenarios, we have recently implemented a forecast error model which estimates a variance/covariance matrix for IMF WEO forecasts using Bayesian inference. Draws are then sampled from the posterior predictive distribution and applied to the current baseline forecast.

The second step after scenario generation – the translation into risk parameters – currently still relies on a separate infrastructure for model estimation and selection, from which estimated models are imported into ARNIE via the data pool. Moreover, ARNIE also contains a module for analyzing interbank exposure contagion. We have switched from the more common Eisenberg/Noe algorithm to a Furfine-type default cascade model (see section 4.2), and further methodological work on the contagion model is planned.

All in all, ARNIE passed its first litmus test, the stress-testing exercise of the 2013 Austrian FSAP, quite well. We were able to react quickly to new requirements by the IMF and our management alike. Further work will focus on both refining existing models to widen the scope of existing analyses and developing new models to provide analytical capabilities for assessing relevant macroprudential policy.

2.4 Sensitivity Analyses

Beyond the risk emanating from cyclical credit risk, the solvency position of banks may come under stress from various other risks. To account for those risks we conduct a number of additional sensitivity analyses which are independent from the macroeconomic scenarios.

Foreign Currency Lending Sensitivity

One of the main risks facing the Austrian banking system is the significant stock of foreign currency loans. As we cover cyclical credit risk under the main scenarios we model the indirect credit risk stemming from an appreciation of the foreign currencies and its impact on borrowers' ability to service their debt. We calculate two separate sensitivity analyses, covering (i) foreign currency loans taken out by CESEE or CIS borrowers and (ii) the foreign currency loan portfolios of Austrian banks, as

the two differ substantially with regard to their loan characteristics. Moreover, we focus on loans denominated in Swiss francs in particular, as the overwhelming majority of foreign currency loans taken out in Austria are denominated in this currency. For CESEE we also focus on the Swiss franc, mainly because our econometric models do not produce reliable results for other foreign currencies.

Foreign currency loans taken out by CESEE or CIS borrowers are mostly installment loans, i.e. we can directly observe the additional impact of exchange rate fluctuations on the impairments for foreign currency loans in comparison to local currency loans. As we observe that the relationship between foreign currency appreciation and the credit risk underlying foreign currency loans is not linear[17] we use nonlinear (exponential and quadratic)[18] functional forms to fit the data and account for

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[17] *For small appreciations the credit risk only increases slightly whereas large appreciations have a disproportionate impact.*

[18] *In addition, we used different estimation criteria for fitting the curves: quadratic errors, absolute errors and robust (Huber-type) estimation. Altogether, we end up with 15 different models. For the final calculation we used an average over these models.*

the losses as CESEE/CIS foreign currency sensitivity.

For the foreign currency loans of domestic borrowers, we need to apply an indirect method as most Austrian foreign currency loans are bullet loans. We model debtors' disposable income after debt servicing as a function of exchange rate changes. As debt servicing exceeds disposable income we introduce hypothetical provisioning requirements which we then distribute equally over the loan's remaining maturity, thus accounting for the share of additional impairments allotted to the scenario horizon as domestic foreign currency sensitivity.

Market Risk Sensitivity for the Trading Book

To analyze market risk sensitivity, we ask the top-5 banks to provide results based on a given set of stressed market risk parameters. With regard to the methodology we follow the approach in EBA's 2011 EU-wide stress test,[19] while the risk parameters are recalibrated in cooperation with the IMF.

Securitization Exposures Sensitivity

For the credit risk sensitivity of securitization positions, we follow the methodology of EBA's EU-wide stress test 2011 as well. The approach excludes securitization positions from the traditional, expected loss-based calculation of credit risk losses. Instead, stress is applied through an increase in risk-weighted assets.[20]

Sovereign Exposures Sensitivity

For sensitivity analyses covering the risk emanating from banks' holding of sovereign bonds, we calculate the impact of valuation losses based on historically observed yield changes provided by the IMF. We apply these haircuts to market values of banks' entire sovereign bond portfolios independent of their accounting treatment.[21]

2.5 Results of the Sensitivity Analyses

Despite the fact that sensitivity analyses cover risks that we do not cover in the "core run" of our solvency stress tests we compute their impact based on assumptions loosely based on or inspired by the main macroeconomic scenarios. Losses and increases in risk-weighted assets (with respect to securitization exposure) are then evenly spread across the three-year stress test horizon, fully

Chart 7

Maximum Impact of the Sensitivity Analyses on the EBA Core Tier 1 Ratio of the Austrian Banking System
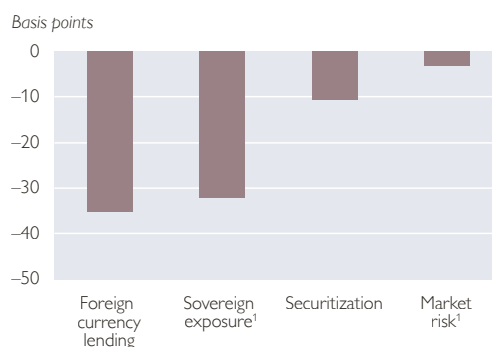
Source: IMF, OeNB.

[1] Due to the granularity of the available data, the results for the sensitivity of the Austrian banking system to sovereign exposure and market risk reflect only the impact of the top 5 banks.

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[19] See EBA (2011).

[20] Due to criticism regarding the disproportionate impact of the rating migrations under the adverse scenario, we base the sensitivity analysis on the baseline calibration. See EBA (2011).

[21] Gains/losses for bonds not valued at fair value are marked to market as well, and gains and losses are allowed to offset each other.

accounting for tax effects. We investigate the impact of each sensitivity analysis in terms of (i) absolute impact and (ii) the change in the core tier 1 ratio at the end of the observation period end-2015.

Chart 7 shows the maximum impact of each of the four sensitivity analyses we observe. The impact is never that high that the overall assessment of the solvency stress test would need to be revised. However, it becomes evident that foreign currency lending denominated in Swiss francs – with losses arising almost evenly domestically and at cross-border subsidiaries – and severe stress in the market of sovereign debt pose substantially more risk than banks' securitization exposures or their market risk in the trading book.

3 Liquidity Stress Test

While the objective of a solvency stress test is to assess the resilience of banks to shocks to their capital position, the objective of a liquidity stress test is to assess the ability of banks to meet their payment obligations on time at reasonable costs.[22] A liquidity stress test therefore considers the timing of cash inflows and outflows and the evolution of unencumbered liquid assets (the counterbalancing capacity) which can be used to generate cash to cover unexpected net outflows. A bank fails the solvency stress test if its capital ratio falls below a certain threshold, while

it fails the liquidity stress test if the cumulated counterbalancing capacity is not sufficient to cover its cumulated net funding gap. The following sections delve deeper into those assumptions and the methodology applied.

3.1 Liquidity Stress Test Framework

The OeNB's liquidity stress test covers the largest 29 domestic banks on a consolidated/subconsolidated level[23] over three different time horizons: 30, 90 and 360 days. Specifically, we analyze cash-flow data including securities flows (i.e. changes in banks' counterbalancing capacity)[24] that banks report on a weekly basis as a combination of contractual and behavioral cash flows, together with their counterbalancing capacity across six currencies and five maturity buckets. For each of those dimensions, banks report figures for roughly 15 line items,[25] or up to around 1 200 data points per bank each week, which add up to a detailed picture of their liquidity positions and their reliance on behavioral components, e.g. expected funding on the unsecured money market.

3.2 Liquidity Risk Scenarios

Similarly to a solvency stress test, a liquidity stress test uses risk parameters which convey the impact of the (macro-economic) scenarios. Here, the scenarios have to be translated into stressed risk parameters: stressed run-off and roll-

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[22] *Again, we broadly follow best practices; see the cash-flow-based approach in Schmieder et al. (2012) and BCBS (2013a, b).*

[23] *Our sample covers about 80% of the Austria banking system.*

[24] *A cash-flow template contains data on banks' contractual and behavioral cash-flows in various maturity buckets and currencies; ideally, it also captures contractual and behavioral securities flows. In contrast, implied cash-flow approaches generate cash-flows from stock data. The former contains more information on banks' liquidity risk exposure and liquidity risk-bearing capacity.*

[25] *Inflows encompass, for example, receivables from unsecured money market lending, reverse repos, maturing foreign currency swaps, expected new issuance; similarly outflows contain the mirror flows; the counterbalancing capacity contains various asset categories as well as expected inflows due to parent bank support. Inflows, outflows and securities flows are interlinked via repos, reverse repos, paper in own portfolio maturing and expected financial re-investment. The structure of the template ensures that all material cash and securities flows are captured.*

over rates for the cash-flows and stressed haircuts for the counterbalancing capacity. Contrary to the econometric approach in solvency stress tests that links the scenarios to risk factors, the lack of time series forces us to perform this translation based on expert judgment. We address model uncertainty by covering a matrix of liquidity risk scenarios which is anchored in the macroeconomic scenarios and informed by a detailed analysis of past evidence, including experience from the recent crisis.[26] To address scenario uncertainty, we construct 15 embedded scenarios for each of the three time horizons. The results can be summarized in matrices (see chart 8) across two dimensions with increasing severity: Horizontally scenario severity increases, vertically the usability of the counterbalancing capacity is gradually reduced to reflect decreasing reliance on central bank bail-outs.

Those scenarios are then tested for each currency.

Stressing Inflows and Outflows

In addition to the baseline scenario (i.e. business-as-usual liquidity positions as reported) we construct a mild, a medium and a severe market scenario. This is complemented by a combined scenario which adds an idiosyncratic (bank-specific) shock to the severe market scenario.

The scenarios for the 30-day stress test horizon

For the mild market scenario, we assume that unsecured interbank markets close for all banks, and that all foreign currency swap markets close as well. Given the exposure of some Austrian banks to funding liquidity risk in U.S. dollars and Swiss francs, the scenario is not really mild, but in our hierarchy of

Chart 8

Overview of the Liquidity Stress Test Scenarios
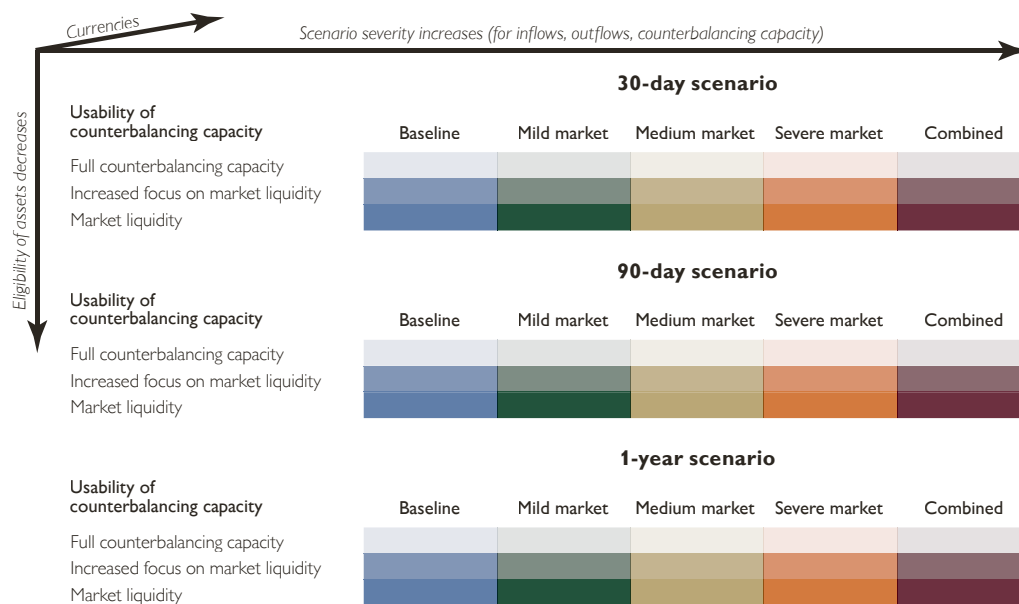
Source: OeNB.

[26] See BCBS (2013a, b), Schmieder et al. (2012) and the data and literature cited therein.

embedded scenarios it is the mildest. In addition, the medium market scenario assumes that the expected issuance of short-term and long-term secured and unsecured debt is reduced by 50%. In addition, we stress liquidity commitments to banks (increase of 50%) and nonbanks (increase of 50%). In the severe market scenario, issuance markets dry up completely and draw-downs of committed lines to banks and nonbanks double. The combined scenario, finally, adds an idiosyncratic shock to the severe market scenario. It consists of a reduction of expected rollover rates of wholesale deposits to 90% and of retail deposits to 95% over the 30-day period.[27]

The scenarios for the 90-day stress test horizon

The mild, medium and severe market scenarios for the 90-day stress test horizon are equivalent to those in the 30-day horizon, except that strained market conditions persist three times as long. Thus, the degree of severity is higher over the longer scenarios. However, in the severe market scenario banks are allowed to react to the liquidity shock. Re-investment of maturing paper in own portfolios is reduced to 50% and banks utilize their liquidity buffer to cover stressed net outflows.[28] The combined scenario adds an idiosyncratic shock to the severe market scenario. It consists of a reduction of expected rollover rates of wholesale deposits to 80% and of retail deposits to 90% over the 90-day period. Re-investment of maturing paper in own portfolios is reduced by 100%.

The scenarios for the 12-month stress test horizon

The baseline, mild and medium market scenarios over 12 months are similar to their 30-day and 90-day equivalents, except that the scenario horizon is longer and that banks are allowed to scale back re-investments of maturing paper in own portfolios by 50% due to the length of the stress. The severe market scenario and the combined scenario assume a broad deposit outflow calibrated to the experience of periphery countries during the sovereign debt crisis.[29] The severe market scenario also incorporates an additional solvency/liquidity link (the interaction between a bank's expected future solvency and its access to funding markets, see section 3.4).

Stressing the Counterbalancing Capacity
Modeling banks' central bank dependency

The operational frameworks that the Eurosystem and other central banks (i.e. Bank of England, U.S. Federal Reserve Bank, Swiss National Bank) use to implement monetary policy ensure generous access to central bank liquidity for banks through combinations of full allotment and/or asset purchasing programs, broadened eligibility criteria, and long-term funding programs. However, the liquidity stress test aims at ensuring that banks internalize the negative externality associated with individual banks' liquidity problems and at avoiding the moral hazard problem

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[27] See Schmieder et al. (2012), table 3.

[28] Under a 90-day combined stress, the relaxation of this objective is reasonable; the counterbalancing capacity is maintained to absorb liquidity shocks and should thus be allowed to decrease if liquidity stress prevails for more than a very short period.

[29] This translates into a reduction of rollover rates by 4% for retail deposits and 6% for nonbank wholesale deposits for the severe scenario, and by 5% and 10% for the combined scenario.

associated with implicit liquidity guarantees provided by central banks.[30] Thus, we foresee three distinct, but embedded approaches to testing the usability of the counterbalancing capacity:

For the "full counterbalancing capacity" approach, we assume that all liquid assets, even less liquid assets,[31] can be used to generate cash. However, committed liquidity lines and liquidity injections from parent banks are excluded. For the "increasing focus on market liquidity" approach, we exclude the less liquid assets, and for the "market liquidity" approach we shut out all non-standard central bank operations.[32]

Taking into account market risk and market liquidity risk

We use haircuts to proxy the impact of both price effects and market liquidity effects on the counterbalancing capacity. The baseline and the mild market scenario utilize the haircuts that banks report in the weekly liquidity template (apart from the adjustment necessary to reflect the different approaches to banks' central bank dependency). The 30-day medium market scenario assumes a 5% haircut (on top of the reported haircuts) for unencumbered collateral deposited at central banks. This haircut doubles under the 90-day medium market scenario. For the severe market scenario and the combined scenario, we distinguish between collateral deposited with

the OeNB and with other central banks. The former is stressed on the components of the tradable portfolio[33] ranging from 1% (asset class 1/credit quality step 1)[34] to 100% (asset class 5/credit quality step 5). Nontradable assets are subject to credit migration across credit quality steps according to the output of the macro-to-PD shifts of the solvency stress test. Haircuts increase accordingly. Collateral deposited at non-Eurosystem central banks receive a haircut of 10%. For other components of the counterbalancing capacity (not deposited at central banks) the additional haircuts range from 1% (AAA-rated bonds) to 10% (A-rated bonds). Other components receive haircuts between 15% and 100% (committed lines, liquidity support from the parent banks). The calibration is based on the empirical studies of the behavior of various funding markets.[35] The 90-day severe market scenario and the 90-day combined scenario apply a factor of 1.5 to all haircuts in the respective 30-day scenarios. The haircuts for nontradable assets deposited at the OeNB are based on a 90-day rather than the 30-day PD shift.

3.3 Results of the Liquidity Stress Test

Looking at the aggregate across all currencies, the funding structure of Austrian banks appears resilient. For instance, under the medium scenario across all currencies – according to the

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[30] BCBS (2013a).

[31] Less liquid assets include assets such as BBB corporate bonds, credit claims or other pledgeable assets.

[32] To assess the impact of the scenario under the assumption of a discontinuation of nonstandard central bank measures we increase the haircuts on unencumbered eligible assets deposited with the Eurosystem to 100% for the following types of assets: nonmarketable assets, securities with ratings below A-, unsecured issuances by banks and financial corporates, as well as asset-backed securities.

[33] According to the Eurosystem eligibility criteria for marketable assets (www.ecb.europa.eu/paym/coll/standards/marketable/html/index.en.html)

[34] According to the Eurosystem haircut schedule (ECAF) (www.ecb.europa.eu/press/pr/date/2013/html/pr130718_annex.pdf)

[35] See Schmieder et al. (2012) and BCBS (2013a, b) and the data and literature cited therein.

IMF comparable with other recent European FSAPs – assuming total closure of the unsecured interbank and foreign currency swap markets, and with substantial haircuts in the counterbalancing capacity,[36] the total liquidity shortfall based on the cumulated counterbalancing capacity amounts to only 0.1% (30-day horizon), 0.3% (90-day horizon) and 0.2% (1-year scenario) of total liabilities of the 29 banks in the sample.[37]

While the liquidity situation of the system has improved substantially since 2008, some banks are lagging behind in their adjustment process in particular with regard to foreign currency funding. While the situation across banks has continuously improved for U.S. dollar liquidity, the picture is less reassuring for the Swiss franc. Only about half of the banks in the sample show a high resilience to Swiss franc liquidity shocks. Given the fact that there are maturity structure limits to reducing the asset portfolios denominated in Swiss francs, it is important that these banks lengthen their average Swiss franc funding tenors to a period of up to two years, diversify into repo markets, and increase their Swiss franc liquidity buffers.

3.4 Linking Solvency to Liquidity

Up to the recent FSAP stress tests, we ran solvency and liquidity stress tests as two entirely separate exercises without any mutual impact. In reality there are important interactions between banks' solvency and liquidity positions. In the 2013 round of stress tests we therefore implemented links to capture some of

these effects. As the calibration of such interactions is not straightforward this area merits further work, at both national and international levels.[38]

In principle, solvency and liquidity can interact in two directions: The solvency position can influence the liquidity position (e.g. defaulting assets reduce inflows), and the liquidity position can influence solvency (e.g. via funding costs). In the liquidity stress test only the former was implemented (see below). The latter is investigated in the contagion analysis (see chapter 5).

We modeled the impact of solvency stress results on the liquidity stress test via multiple channels: (i) the rating migrations in the solvency stress test are mapped on credit claims deposited by banks as collateral at the central bank, which reduce their counterbalancing capacity; (ii) assets which default in the solvency stress test reduce cash inflows; (iii) the solvency position of a bank impacts its access to funding markets.

First, the migration of credit claims pledged to the central bank across credit quality steps (and, thus, haircut categories) has to be derived from detailed bank-level collateral data. We assume that loan volumes are identically distributed across the respective PDs in each credit quality step. An increase in PDs shifts the PD range for each credit quality step upward. The weighted sum across each bank's credit claim migration across credit quality steps is again weighted by the bank's share of non-marketable assets in its entire volume of collateral deposited with the central bank. We apply the composite haircut

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[36] See IMF (2013).

[37] Despite the longer horizon the liquidity gap in the 1-year scenario is marginally lower than in the 90-day scenario due to the ability to access funding markets by the better capitalized banks and the embedded banks' behavioral reactions.

[38] See Puhr and Schmitz (2013).

to the respective lines in the liquidity stress test to derive the decreased liquidity generation capacity.

Second, the calibration of reduced cash inflows due to defaulting assets' impact is a direct output of the solvency stress test (for loans and advances) rescaled to the appropriate liquidity stress-test time horizon. The calibration for nonfinancial bonds is more demanding, as banks do not report the composition of their own-portfolio assets. We approximate it by the share of banks' reported holdings of nonfinancial bonds in their stock of highly liquid assets and the migration of loans to nonfinancials across PD buckets.

Third, modeling the interaction between a bank's expected future solvency and its access to funding markets is inspired by the dynamics observed in the asset-backed commercial paper market during the post-Lehman financial market turmoil. We assume that, initially, issuance markets (secured/unsecured as well as short-term and long-term) are closed for all banks. After the first quarter, uncertainty is reduced and investors are able to distinguish between stable and less stable banks. The calibration is based on the results of the solvency stress test at $t+1$ year, i.e. implicitly investors are forward-looking and use similar models to assess expected future solvency as the solvency stress test and arrive at similar conclusions. An empirical basis for the calibration is, however, work in progress.[39]

4 Contagion Analysis

In addition to the solvency and the liquidity stress tests, we perform a contagion analysis to deepen the link between solvency and liquidity while at the same time accounting for losses from interbank exposures. Due to reporting data limits for cash-flow data, the contagion analysis horizon is constrained to one year. With regard to severity, the liquidity stress scenario in the contagion analysis is similar to the 12-month medium market scenario, including the interaction between a bank's expected future solvency and its access to funding markets (see 3.4 above).

4.1 Linking Liquidity to Solvency

For the link between liquidity and solvency, we focus on two channels: (i) a cost-of-funding shock and (ii) asset fire-sale losses. Both influence solvency via profit or loss effects. We model the cost-of-funding shock as a market shock that affects both retail and wholesale deposits as well as new issuances[40] and apply the aggregate impact to the stressed cash flows. In addition, some pass-through to new loans is possible. As such, the impact of the cost-of-funding shock is driven by the maturity mismatch and the spread shock on existing assets rather than by pass-through constraints. Even if banks were able to pass through most of the funding shock, the volume of loans where banks can adjust the pricing is much lower than that of liabilities due to banks' maturity transformation.

With the asset fire-sale losses we capture contagion through common exposures via price and market liquidity impacts on banks' counterbalancing capacity and their profit or loss. Fire-

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[39] An important channel from solvency to liquidity which the approach disregards is the impact of a bank's solvency position and its access to unsecured interbank markets. Already the standard market liquidity stress scenario assumes a complete dry-up of the unsecured interbank market and, thus, preempts the potential impact of this channel.

[40] New issuances, however, play a minor role, as most banks are assumed to be shut out of issuance markets anyhow.

sale shocks are calibrated based on the haircuts in the stress test plus the solvency shock that feeds into haircuts via the migration matrix of credit claims deposited as collateral with the central bank. Unlike the cost-of-funding shock, which is a market shock, the losses due to asset fire sales are bank-specific. If a bank does not have a cumulated net funding gap over the stress horizon, it does not have to sell liquid assets and, hence, does not face any losses from asset fire sales. This is also true if there are enough cash reserves to cover the gap.

However, depending on the accounting framework under which the respective assets are treated, fair value accounting can lead to solvency effects even if the bank does not have to sell the respective asset. To account – at least partially – for these effects, the model assumes a theoretical loss due to asset fire sales under the assumption that all assets are subject to fair value accounting and that banks sell their counterbalancing capacity assets (except cash) proportionally to their cumulated net funding gap. As such, banks with less liquid assets face higher fire sale losses.[41]

4.2 Modeling Contagion

Contagion is modeled using a Furfine rather than the Eisenberg/Noe model,[42] which we used to apply at the OeNB. We chose to switch to the former due to methodological concerns about the implicit LGD of the latter, which might yield inadequate (i.e. very low) values and therefore low contagion losses. The Furfine contagion model works as follows: any bank that falls below a given threshold is assumed to default on all its interbank obligations with the

same exogenous LGD for all borrowers. For the purpose of the FSAP stress test, we set the capital threshold to the regulatory minimum of 8% (capital adequacy ratio) and the LGD to 100%, which can be read as very conservative assumptions.

In the OeNB implementation, we measure the capital adequacy ratio at the consolidated level (as is usually the case for solvency stress tests), while contagion losses are computed at the unconsolidated level. If a consolidated group falls below the default threshold, all unconsolidated entities of the group are considered to be in default. Unconsolidated losses are then computed by netting unconsolidated exposures (excluding intra-group exposures) bilaterally and deducting collateral without haircuts. These losses are then consolidated to arrive at the consolidated capital adequacy ratio impact.

5 Conclusions

In this paper we present the main concepts and methods used in the Austrian 2013 FSAP stress test. We cover solvency and liquidity stress tests as well as, as part of our contagion analysis, the interaction of solvency with liquidity. The mechanics of solvency stress testing, following a balance sheet framework (Schmieder et al., 2011), are by and large well established. The main challenges lie in producing consistent results: striking the right balance between bank profitability and losses in both baseline and adverse scenarios on the one hand while keeping the economic and regulatory perspective on the other is not trivial. This is exacerbated by two additional challenges: (i) Results rely heavily on valid starting points, and data quality and consistency

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[41] For a discussion of the literature on asset fire sales and its implications in our model see Puhr and Schmitz (2013).

[42] See Furfine (2003) and Eisenberg and Noe (2001), respectively.

issues pose a serious threat to the validity of results. At the same time (ii) banks have established a reputation for managing their earnings and optimizing their risk-weighted assets, both of which substantially impact econometric models that link scenarios to risk factors. On a more positive note, our experiences combining fully-fledged scenarios with sensitivity analyses are positive: This approach allows us to incorporate estimates for specific risks which cannot be consistently captured in a macroeconomic scenario, and the results thus produced are easy to communicate. Thus, this approach should enable us to address at least some of the aforementioned problems.

With regard to liquidity stress testing we face somewhat different issues. While there is no commonly agreed approach yet – see Schmieder et al. (2012) – the starting point for our analysis is the OeNB's extensive cash-flow reporting framework, which is an asset. However, we still need to address the lack of established econometric models that link scenarios with risk factor shifts (run-off rates, haircuts, etc.). To address model and scenario uncertainty, we opt for a rather large number of scenarios to uncover pockets of vulnerability in banks' balance sheets. As part of the Austrian FSAP 2013, we work for the first time on a thorough, formal link between solvency and liquidity stress (see Puhr and Schmitz (2013) for further details). While the importance of incorporating these feedback effects is beyond controversy, the implementation is not straightforward. In our models, the greatest issues lie in the different data dimensions for solvency and liquidity stress testing: Whereas solvency looks

at countries and sectors, liquidity deals with cash flows across product types, maturities and currencies. Mapping those cash flows into the solvency world (and vice versa) is a major challenge which underlines the need for microdata-based regulatory reporting. For tail events, firm econometric foundations to model the interaction between banks' solvency, funding liquidity and market reactions are, moreover, still restricted to an abstract academic world. Nevertheless, we believe that those feedback channels are at least as important as traditional interbank contagion, but that they have received far less attention so far. More work is needed here.

Finally, the collaboration with the IMF provided us with an outside view on the stress-testing framework of the OeNB and with ample feedback for advancing our theoretical as well as practical approach to stress testing. See IMF (2013) for the Fund's perspective on the stress-testing exercise for Austria's 2013 FSAP. Moreover, the launch of our new systemic risk assessment tool, ARNIE, enabled us to enhance the calculations of the solvency stress test as well as the contagion analysis. While some features like modularity or the data abstraction layer will play out their strengths over time, the new data structure and the reporting routines provided an immediate payoff. Compared with our previous mix of tools and models, having a single framework in place that allows for adjustments and reporting in a consistent fashion was invaluable. We are confident that ARNIE will enable us to delve deeper into the assessment of macroprudential risks in the future.

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Annex of Tables

Annex of Tables

Cutoff date for data: November 14, 2013

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

Exchange Rates

	2009	2010	2011	2012	2010	2011	2012	2013
	Year				1st half			
	Period average (per EUR 1)							
U.S. dollar	1.39	1.33	1.39	1.29	1.33	1.33	1.40	1.31
Japanese yen	130.35	116.38	110.99	102.65	127.27	121.53	115.02	125.34
Pound sterling	0.89	0.86	0.87	0.81	0.89	0.87	0.87	0.85
Swiss franc	1.51	1.38	1.23	1.21	1.51	1.44	1.27	1.23
Czech koruna	26.45	25.29	24.59	25.15	25.73	24.35	25.17	25.70
Hungarian forint	280.54	275.36	279.31	289.32	271.64	269.42	295.39	296.08
Polish złoty	4.33	3.99	4.12	4.18	4.00	3.95	4.24	4.18

Source: Thomson Reuters.

Key Interest Rates

	2009	2010		2011		2012		2013
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	End of period, %							
Euro area	1.00	1.00	1.00	1.25	1.00	1.00	0.75	0.50
U.S.A.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Japan	0.09	0.10	0.08	0.07	0.08	0.07	0.08	0.07
United Kingdom	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Switzerland[1]	0.00–0.75	0.00–0.75	0.00–0.75	0.00–0.75	0.00–0.25	0.00–0.25	0.00–0.25	0.00–0.25
Czech Republic	1.00	0.75	0.75	0.75	0.75	0.50	0.05	0.05
Hungary	6.25	5.25	5.75	6.00	7.00	7.00	5.75	4.25
Poland	3.50	3.50	3.50	4.50	4.50	4.75	4.25	2.75

Source: Eurostat, Thomson Reuters, national sources.

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

Short-Term Interest Rates

	2009	2010	2011	2012	2010	2011	2012	2013
	Year				1st half			
	Three-month rates, period average, %							
Euro area	1.23	0.81	0.84	0.57	0.67	1.26	0.87	0.21
U.S.A.	0.69	0.34	0.35	0.43	0.35	0.28	0.49	0.28
Japan	0.59	0.39	0.38	0.33	0.42	0.34	0.34	0.26
United Kingdom	1.22	0.74	0.75	0.86	0.68	0.82	1.05	0.50
Switzerland	0.37	0.19	0.18	0.07	0.21	0.18	0.09	0.02
Czech Republic	4.04	2.19	1.31	1.19	1.41	1.21	1.22	0.48
Hungary	8.87	8.64	5.51	6.19	5.61	6.07	7.32	4.99
Poland	6.36	4.42	3.92	4.54	3.99	4.26	5.00	3.36

Source: Bloomberg, Eurostat, Thomson Reuters.

Long-Term Interest Rates

	2009	2010	2011	2012	2010	2011	2012	2013
	Year				1st half			
	Ten-year rates, period average, %							
Euro area	3.71	3.34	3.86	3.22	3.45	5.36	3.46	2.94
U.S.A.	4.07	4.25	3.91	1.79	4.49	4.45	3.04	1.96
Japan	1.34	1.17	1.12	0.85	1.30	1.21	0.93	0.71
Austria	3.94	3.23	3.32	2.37	3.47	3.60	2.79	1.84
United Kingdom	3.66	3.58	3.06	1.85	3.87	3.58	1.96	1.74
Switzerland	2.20	1.63	1.47	0.65	1.81	1.89	0.72	0.78
Czech Republic	4.84	3.88	3.71	2.78	4.14	3.97	3.33	1.93
Hungary	9.12	7.28	7.64	7.89	7.29	7.29	8.71	5.94
Poland	6.12	5.78	5.96	5.00	5.85	6.15	5.44	3.76
Slovakia	4.71	3.87	4.45	4.55	3.95	4.30	4.92	3.30
Slovenia	4.38	3.83	4.97	5.81	3.90	4.40	5.62	5.41

Source: Eurostat, national sources.

Corporate Bond Spreads

	2009	2010	2011	2012	2010	2011	2012	2013
	Year				1st half			
	Period average, percentage points							
	Spreads of 7- to 10-year euro area corporate bonds against euro area government bonds of the same maturity							
AAA	0.69	−0.03	−0.41	−0.96	0.01	−0.25	−0.89	−0.80
BBB	4.65	2.06	2.18	1.68	2.06	1.62	2.08	1.10
	Spreads of 7- to 10-year U.S. corporate bonds against U.S. government bonds of the same maturity							
AAA	1.64	0.70	0.90	0.69	0.70	0.74	0.71	0.76
BBB	4.51	2.21	2.34	2.59	2.18	1.91	2.77	2.15

Source: Merrill Lynch via Thomson Reuters.

Stock Indices[1]

	2009	2010	2011	2012	2010	2011	2012	2013
	Year				1st half			
	Period average							
Euro area: Euro STOXX	234	266	256	240	265	283	234	270
U.S.A.: S&P 500	947	1,140	1,268	1,379	1,129	1,311	1,348	1,562
Japan: Nikkei 225	9,337	10,028	9,431	9,109	10,450	9,951	9,157	12,522
Austria: ATX	2,131	2,558	2,466	2,099	2,529	2,837	2,053	2,418
Czech Republic: PX50	962	1,171	1,111	950	1,183	1,241	938	982
Hungary: BUX	16,043	22,480	20,532	18,064	22,531	22,990	17,987	18,729
Poland: WIG	32,004	42,741	44,605	41,636	40,894	48,467	40,016	46,187
Slovakia: SAX16	318	226	228	197	230	235	202	185
Slovenia: SBI TOP	975	891	726	567	948	803	574	623

Source: Thomson Reuters.

[1] *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.*

Gross Domestic Product

	2009	2010	2011	2012	2010	2011	2012	2013
	Year				1st half			
	Annual change in %, period average							
Euro area	−4.4	2.0	1.6	−0.7	1.6	2.2	−0.4	−0.9
U.S.A.	−2.8	2.5	1.8	2.8	2.2	2.0	3.1	1.5
Japan	−5.5	4.7	−0.6	2.0	4.7	−0.8	3.6	0.7
Austria	−3.8	1.8	2.8	0.9	1.2	4.6	0.8	0.1
Czech Republic	−4.5	2.5	1.8	−1.0	2.1	2.7	−0.7	−2.1
Hungary	−6.8	1.3	1.6	−1.7	0.7	2.0	−1.2	−0.2
Poland	1.6	3.9	4.5	1.9	3.2	4.4	2.8	0.8
Slovakia	−4.9	4.4	3.2	2.0	4.8	3.3	2.7	0.8
Slovenia	−7.9	1.3	0.7	−2.5	0.4	2.1	−1.9	−3.2

Source: Eurostat, national sources.

Current Account

	2009	2010	2011	2012	2010	2011	2012	2013
	Year				1st half			
	% of GDP, cumulative							
Euro area	−0.1	0.1	−0.1	1.8	−0.5	−0.6	0.4	1.6
U.S.A.	−3.3	−3.3	−3.3	−3.0	−3.3	−3.2	−3.3	−3.0
Japan	2.8	3.5	2.9	1.1	3.8	2.4	1.3	..
Austria	3.0	3.2	2.7	3.0	4.2	1.9	1.6	3.6
Czech Republic	−2.4	−3.9	−2.7	−2.4	−0.3	−3.1	−0.5	0.5
Hungary	−0.2	0.2	0.4	1.0	0.1	0.5	0.7	2.8
Poland	−3.9	−5.1	−5.0	−3.7	−3.3	−4.4	−4.0	−1.1
Slovakia	−2.6	−3.7	−2.1	2.3	−1.9	−1.9	2.5	4.8
Slovenia	−0.5	−0.1	0.4	3.3	−0.1	1.1	2.0	6.8

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.

Inflation

	2009	2010	2011	2012	2010	2011	2012	2013
	Year				1st half			
	Annual change in %, period average							
Euro area	0.3	1.6	2.7	2.5	1.4	2.6	2.6	1.6
U.S.A.	−0.4	1.6	3.2	2.1	2.1	2.8	2.4	1.5
Japan	−1.4	−0.7	−0.3	−0.2	−1.1	−0.5	0.2	−0.4
Austria	0.4	1.7	3.6	2.6	1.5	3.3	2.5	2.4
Czech Republic	0.6	1.2	2.1	3.5	0.7	1.9	3.9	1.6
Hungary	4.0	4.7	3.9	5.7	5.5	4.1	5.6	2.3
Poland	4.0	2.7	3.9	3.7	2.9	3.8	4.1	0.9
Slovakia	0.9	0.7	4.1	3.7	0.3	3.8	3.8	2.0
Slovenia	0.9	2.1	2.1	2.8	2.1	2.1	2.5	2.2

Source: Eurostat.

The Real Economy in Austria

Financial Investment of Households[1]

	2009	2010	2011	2012	2010	2011	2012	2013
	Year				1st half			
	Transactions, EUR million							
Currency and deposits[2]	9,115	3,371	6,730	5,643	2,264	3,278	5,600	661
Securities (other than shares)[3]	−237	865	1,506	46	155	1,632	−139	−1,366
Shares (other than mutual fund shares)	1,018	1,515	650	554	534	52	366	36
Mutual fund shares	948	2,965	−1,750	1,043	893	−730	21	2,000
Insurance technical reserves	4,840	3,910	2,039	2,807	2,443	1,890	1,687	1,535
Total financial investment	15,684	12,626	9,175	10,093	6,289	6,122	7,535	2,866

Source: OeNB.

[1] Including nonprofit institutions serving households.
[2] Including loans and other assets.
[3] Including financial derivatives.

Household[1] Income, Savings and Credit Demand

	2009	2010	2011	2012
	Year			
	Year-end, EUR billion			
Net disposable income	169.1	171.3	175.1	181.7
Savings	19.1	15.3	11.8	13.4
Saving ratio in %[2]	11.2	8.9	6.7	7.4
MFI loans to households	132.6	139.7	142.8	143.9

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

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

Financing of Nonfinancial Corporations

	2009	2010	2011	2012	2010	2011	2012	2013
	Year				1st half			
	Transactions, EUR million							
Securities (other than shares)	5,939	3,848	8,195	5,469	2,130	2,467	3,461	1,943
Loans	−16,766	14,386	13,699	2,029	4,177	8,865	3,480	−566
Shares and other equity[1]	3,781	−22,672	20,079	5,214	988	11,742	1,488	2,627
Other accounts payable	−5,235	7,601	2,982	1,469	3,783	2,262	1,354	−853
Total debt	−12,281	3,163	44,955	14,181	11,077	25,336	9,783	3,151

Source: OeNB.

[1] Including other equity of domestic special purpose entities held by nonresidents.

Insolvency Indicators

	2009	2010	2011	2012	2010	2011	2012	2013
	Year				1st half			
	EUR million							
Default liabilities	4,035	4,700	2,775	3,206	1,587	1,157	1,422	3,747
	Number							
Defaults	3,741	3,522	3,260	3,505	1,724	1,657	1,816	1,639

Source: Kreditschutzverband von 1870.

Note: Default liabilities for 2013 (1st half) include EUR 2,600 million of Alpine Bau GmbH.

Selected Financial Statement Ratios of the Manufacturing Sector

	2009	2010	2011	2012
	Year			
	Median, %			
Self-financing and investment ratios				
Cash flow, as a percentage of turnover	7.56	8.05	7.76	7.06
Investment ratio[1]	1.92	1.97	2.06	2.38
Reinvestment ratio[2]	62.69	66.67	74.60	89.86
Financial structure ratios				
Equity ratio	22.42	23.05	23.92	26.05
Risk-weighted capital ratio	27.90	28.90	29.40	31.84
Bank liability ratio	32.44	30.47	29.71	27.24
Government debt ratio	7.35	7.60	7.70	7.59

Source: OeNB.

[1] *Investments x 100 / net turnover.*
[2] *Investments x 100 / credit write-offs.*

Note: Provisional data for 2012.

Financial Intermediaries in Austria[1]

Total Assets and Off-Balance-Sheet Operations

	2009	2010		2011		2012		2013
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	End of period, EUR million							
Total assets on an unconsolidated basis	1,029	1,027	979	993	1,014	1,011	982	946
of which: total domestic assets	691	675	660	663	693	697	679	645
total foreign assets	338	352	319	330	321	314	304	301
Interest rate contracts	1,836	2,067	1,397	1,505	1,430	1,357	1,052	944
Foreign exchange derivatives	419	492	273	261	275	280	251	210
Other derivatives	25	27	17	20	16	17	16	18
Derivatives total	2,281	2,587	1,687	1,786	1,721	1,654	1,319	1,172
Total assets on a consolidated basis	1,140	1,193	1,131	1,137	1,166	1,189	1,164	1,125

Source: OeNB.

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

Profitability on an Unconsolidated Basis

	2010	2011	2012	2013	2009	2010	2011	2012
	1st half				Year			
	End of period, EUR million							
Net interest income	4,584	4,676	4,503	4,312	8,777	9,123	9,624	8,820
Income from securities and participating interests	1,575	2,038	1,817	1,563	3,327	4,026	3,662	3,670
Net fee-based income	1,970	1,964	1,902	2,034	3,603	3,950	3,835	3,850
Net profit/loss on financial operations	454	366	335	222	486	664	325	630
Other operating income	766	848	995	1,093	1,653	1,942	1,786	2,150
Operating income	9,348	9,892	9,551	9,224	17,846	19,706	19,232	19,120
Staff costs	2,839	2,963	2,985	3,163	5,697	5,802	6,002	6,243
Other administrative expenses	1,888	1,962	1,992	2,053	3,765	3,940	4,029	4,124
Other operating expenses	807	764	804	996	1,056	1,252	1,179	1,827
Total operating expenses	5,534	5,689	5,781	6,212	11,077	11,547	11,718	12,193
Operating profit/loss	3,813	4,203	3,770	3,013	6,769	8,159	7,515	6,927
Net risk provisions from credit business	3,404	2,199	2,114	2,742	4,422	2,802	2,427	1,488
Net risk provisions from securities business	−43	169	−326	783	4,090	520	3,276	1,033
Annual surplus[1]	2,974	3,876	3,577	1,115	43	4,231	1,212	3,214
Return on assets[1,2]	0.3	0.4	0.35	0.1	0.0	0.4	0.1	0.3
Return on equity (tier 1 capital)[1,2]	4.1	5.2	4.8	1.5	0.1	5.8	1.6	4.3
Interest income to gross income (%)	49	47	47	47	49	46	50	46
Operating expenses to gross income (%)	59	58	61	67	62	59	61	64

Source: OeNB.

[1] *Annual surplus in % of total assets and tier 1 capital, respectively.*
[2] *Retrospective modification due to a change in calculation.*

[1] *Since 2007, the International Monetary Fund (IMF) has published Financial Soundness Indicators (FSI) for Austria (see also www.imf.org). In contrast to some FSIs which take only domestically owned banks into account, the Financial Stability Report takes into account all banks operating in Austria. For this reason, some of the figures presented here might deviate from the figures published by the IMF.*

Profitability on a Consolidated Basis

	2010	2011	2012	2013	2009	2010	2011	2012
	1st half				Year			
	End of period, EUR million							
Operating income	18,497	18,749	18,939	17,454	37,850	37,508	37,207	37,682
Operating expenses[1]	7,944	8,249	8,307	8,450	15,502	16,204	16,594	16,804
Operating profit/loss	6,612	6,529	6,525	4,954	15,620	13,478	10,369	12,097
Net profit after taxes	1,789	2,897	3,031	1,061	1,530	4,577	711	2,971
Return on assets[2,5]	0.4	0.6	0.6	0.3	0.2	0.5	0.1	0.3
Return on equity (tier 1 capital)[2,5]	6.3	9.8	10.1	4.2	3.6	8.2	1.7	5.1
Interest income to gross income (%)[3]	64	65	61	70	59	64	66	63
Cost-income ratio (%)[4]	58	58	59	66	53	58	66	62

Source: OeNB.

[1] As from 2008, operating expenses refer to staff costs and other administrative expenses only.

[2] 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.

[3] All figures represent the ratio of net interest income to total operating income less other operating expenses.

[4] All figures represent the ratio of total operating expenses less other operating expenses to total operating income less other operating expenses.

[5] Retrospective modification due to a change in calculation.

Note: Due to changes in reporting, the comparability of consolidated values as from 2008 with earlier values is limited.

Sectoral Distribution of Loans

	2009	2010		2011		2012		2013
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	End of period, EUR million							
Nonfinancial corporations	130,206	131,744	133,302	134,176	136,913	138,627	138,032	138,356
of which: foreign currency-denominated loans	11,106	12,150	12,197	12,080	11,804	10,913	8,787	7,732
Households[1]	128,224	128,221	131,288	133,370	134,520	135,031	135,485	134,336
of which: foreign currency-denominated loans	36,127	38,317	39,041	39,228	37,725	35,942	32,018	29,205
General government	26,116	27,324	27,174	27,930	29,953	28,518	28,780	27,771
of which: foreign currency-denominated loans	1,742	2,797	2,761	3,156	3,408	3,283	2,973	2,660
Other financial intermediaries	24,516	24,454	22,827	22,056	21,612	21,439	20,642	20,125
of which: foreign currency-denominated loans	3,348	3,736	3,487	3,316	3,131	2,997	2,752	2,788
Foreign nonbanks	117,726	120,890	117,412	119,822	123,479	124,023	117,998	116,751
of which: foreign currency-denominated loans	36,100	40,274	38,286	38,656	41,242	41,291	37,842	37,281
Nonbanks total	426,788	432,633	432,003	437,354	446,477	447,638	440,936	437,339
of which: foreign currency-denominated loans	88,423	97,274	95,772	96,436	97,310	94,427	84,372	79,666
Banks	333,865	334,777	281,989	300,374	294,261	299,794	266,326	259,713
of which: foreign currency-denominated loans	83,728	76,629	64,293	67,835	65,033	67,497	59,026	59,499

Source: OeNB.

[1] Including nonprofit institutions serving households.

Note: Figures are based on supervisory statistics and therefore differ from monetary figures used in the text.

Foreign Currency-Denominated Claims on Domestic Non-MFIs

	2009	2010		2011		2012		2013
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	End of period, % of total foreign currency-denominated claims on domestic non-MFIs[1]							
Swiss franc	86.3	85.5	86.6	87.2	86.0	85.5	86.4	86.8
Japanese yen	5.4	5.9	5.8	5.4	6.3	6.4	6.0	4.9
U.S. dollar	6.7	7.2	6.1	5.9	6.1	6.6	6.2	6.6
Other foreign currencies	1.6	1.4	1.5	1.5	1.6	1.5	1.4	1.7

Source: OeNB, ECB.

[1] The indicated figures refer to claims of monetary financial institutions (MFIs, ESA definition) on domestic non-MFIs. Given the differences in the definition of credit institutions according to the Austrian Banking Act and of MFIs according to ESA and differences in the number of borrowers, comparability to "Claims on Domestic Nonbanks" is limited. Due to rounding, figures do not add up to 100% for every year.

Loan Quality

	2009	2010		2011		2012		2013
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	End of period, % of claims							
Specific loan loss provisions for loans to nonbanks (unconsolidated)	2.8	3.1	3.2	3.2	3.2	3.2	3.3	3.4
Specific loan loss provisions for loans to nonbanks (consolidated)[1]	3.5	3.9	4.1	4.3	4.3	4.5	4.6	4.8
Nonperforming loan ratio (unconsolidated)[2]	4.2	4.4	4.7	4.6	4.5	4.6	4.7	4.4
Nonperforming loan ratio (consolidated)[2]	6.7	7.6	8.0	8.3	8.3	9.1	8.7	8.8

Source: OeNB.

[1] Estimate.

[2] Estimate for loans to corporates and households (introduced in Financial Stability Report 24 to better indicate the loan quality in retail business; not comparable to former ratios).

Market Risk[1]

	2009	2010		2011		2012		2013
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	End of period, EUR million (unless indicated otherwise)							
Interest rate risk								
Basel ratio for interest rate risk, %[2]	3.7	3.9	3.9	3.6	5.0	4.0	4.0	4.1
Capital requirement for the position risk of interest rate instruments in the trading book	780.9	839.8	618.3	643.6	625.0	477.4	441.9	438.2
Exchange rate risk								
Capital requirement for open foreign exchange positions	75.2	83.1	81.1	83.3	92.3	84.2	70.8	80.3
Equity price risk								
Capital requirement for the position risk of equities in the trading book	176.9	183.0	197.1	219.2	191.3	178.1	151.5	136.1

Source: OeNB.

[1] *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.*

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

Liquidity Risk

	2009	2010		2011		2012		2013
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	End of period, %							
Short-term loans to short-term liabilities	72.5	71.2	64.2	69.0	65.9	69.9	66.0	66.4
Short-term loans and other liquid assets to short-term liabilities	124.8	122.9	118.9	122.9	118.1	122.6	120.6	119.7
Liquid resources of the first degree: 5% quantile of the ratio between available and required liquidity of degree 1[1]	139.9	146.5	145.1	150	152.4	238.6	295.4	252.7
Liquid resources of the second degree: 5% quantile of the ratio between available and required liquidity of degree 2	110.8	112.4	111.3	114.1	110.9	111.2	112.1	116.2

Source: OeNB.

[1] *Short-term loans and short-term liabilities (up to three months against banks and nonbanks). 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.*

Solvency

	2009	2010		2011		2012		2013
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	End of period, eligible capital and tier 1 capital, respectively, as a percentage of risk-weighted assets							
Consolidated capital adequacy ratio	12.8	13.3	13.2	13.5	13.6	13.7	14.2	14.9
Consolidated tier 1 capital ratio	9.3	9.8	10.0	10.3	10.3	10.6	11.0	11.5

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 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 other capital requirements.

Exposure to CESEE

	2009	2010		2011		2012		2013
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	End of period, EUR billion							
Total assets of subsidiaries[1]	254	265	264	269	270	281	277	268
of which: NMS-2004[2]	127	131	131	133	127	137	137	133
NMS-2007[3]	40	40	41	42	42	42	41	40
SEE[4]	49	49	49	51	51	51	51	51
CIS[5]	38	45	43	43	50	51	48	44
Exposure according to BIS in total[6]	204	213	210	225	217	216	210	210
of which: NMS-2004[2]	113	117	116	129	121	124	120	120
NMS-2007[3]	34	33	34	35	33	33	31	31
SEE[4]	40	41	39	42	42	38	37	37
CIS[5]	18	21	20	19	21	21	23	22
Total indirect lending to nonbanks[7]	160	166	169	171	171	176	171	168
of which: NMS-2004[2]	79	80	82	82	79	84	83	81
NMS-2007[3]	25	25	26	26	27	26	26	25
SEE[4]	30	32	32	34	34	34	33	34
CIS[5]	25	29	29	28	31	32	29	28
Total direct lending[8]	51	51	49	51	52	54	53	53
of which: NMS-2004[2]	22	22	22	23	23	23	23	18
NMS-2007[3]	10	9	9	8	8	8	7	7
SEE[4]	15	15	14	15	15	17	17	20
CIS[5]	4	5	4	4	6	6	6	8

Source: OeNB.

[1] Excluding Yapi ve Kredi Bankasi (not fully consolidated by parent bank UniCredit Bank Austria).
[2] New EU Member States since 2004 (NMS-2004): Czech Republic (CZ), Estonia (EE), Latvia (LV), Lithuania (LT), Hungary (HU), Poland (PL), Slovenia (SI), Slovakia (SK).
[3] New EU Member States since 2007 (NMS-2007): Bulgaria (BG), Romania (RO).
[4] Southeastern Europe (SEE): Albania (AL), Bosnia and Herzegovina (BA), Croatia (HR), Kosovo (KO), Montenegro (ME), FYR Macedonia (MK), Serbia (RS), Turkey (TR).
[5] Commonwealth of Independent States (CIS): Armenia (AM), Azerbaijan (AZ), Belarus (BY), Kazakhstan (KZ), Kyrgyzstan (KG), Moldova (MD), Russia (RU), Tajikistan (TJ), Turkmenistan (TM), Ukraine (UA), Uzbekistan (UZ); here also including Georgia (GE).
[6] 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.
[7] Lending (gross lending including risk provisions) to nonbanks by all fully consolidated subsidiaries in CESEE according to asset, income and risk statements.
[8] 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.

Profitability of Austrian Subsidiaries[1] in CESEE

	2010	2011	2012	2013	2009	2010	2011	2012
	1st half				Year			
	End of period, EUR million							
Operating income	6,585	6,934	6,666	6,693	13,396	13,436	13,608	13,268
of which: net interest income	*4,584*	*4,728*	*4,465*	*4,270*	*8,693*	*9,333*	*9,405*	*8,781*
securities and investment earnings	*34*	*57*	*50*	*42*	*50*	*47*	*67*	*61*
fee and commission income	*1,437*	*1,518*	*1,445*	*1,555*	*2,916*	*2,954*	*3,092*	*2,992*
trading income	*−42*	*371*	*301*	*242*	*1,238*	*368*	*430*	*790*
other income	*572*	*260*	*406*	*584*	*498*	*735*	*621*	*643*
Operating expenses	3,177	3,400	3,374	3,587	6,267	6,678	6,814	6,950
of which: personnel expenses	*1,400*	*1,480*	*1,485*	*1,503*	*2,739*	*2,870*	*2,997*	*2,992*
other expenses	*1,778*	*1,920*	*1,889*	*2,084*	*3,529*	*3,809*	*3,817*	*3,958*
Operating profit/loss	3,408	3,535	3,292	3,106	7,129	6,757	6,794	6,317
Allocation to provisions and impairments	1,983	1,592	1,529	1,524	4,829	4,094	4,283	3,512
Result after tax	1,117	1,578	1,356	1,366	1,775	2,073	1,763	2,093
Return on assets[2]	0.9%	1.2%	1.0%	1.0%	0.7%	0.8%	0.6%	0.8%
Provisions[3]	6.2%	6.8%	7.8%	8.0%	5.3%	6.5%	7.3%	7.6%

Source: OeNB.

[1] *Excluding Yapi ve Kredi Bankasi (not fully consolidated by parent bank UniCredit Bank Austria).*
[2] *End-of-period result expected for the full year after tax as a percentage of average total assets.*
[3] *Provisions on loans and receivables in proportion to 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 have been available in detail only since 2008.

Market Indicators of Selected Austrian Financial Instruments

	2009	2010		2011		2012		2013
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
Share prices	*% of mid-2005 prices*							
Erste Group Bank	66.4	66.0	91.8	94.8	35.8	39.4	61.2	52.0
Raiffeisen Bank International	75.7	56.9	82.5	70.9	40.3	50.7	60.3	42.8
Euro STOXX – Banks	70.3	52.7	52.4	53.0	32.8	29.2	35.9	32.9
Uniqa	80.3	85.5	90.2	91.6	57.8	64.4	61.2	58.9
Vienna Insurance Group	81.0	75.2	88.6	90.0	71.7	72.2	90.8	81.3
Euro STOXX – Insurance	75.0	63.8	71.0	77.4	58.8	60.1	76.4	82.8
Relative valuation	*Price-book value ratio*							
Erste Group Bank	0.80	0.79	1.30	1.34	0.48	0.52	0.81	0.69
Raiffeisen Bank International	1.12	0.84	1.15	0.99	0.53	0.67	0.80	0.57
Euro STOXX – Banks	0.94	0.66	0.64	0.58	0.36	0.46	0.60	0.68
Uniqa	1.41	1.50	2.25	2.29	1.18	1.32	1.25	1.21
Vienna Insurance Group	1.03	0.95	1.21	1.23	0.98	0.98	1.24	1.11
Euro STOXX – Insurance	1.03	0.87	0.94	0.93	0.69	0.63	0.81	0.74

Source: Thomson Reuters, Bloomberg.

Key Indicators of Austrian Insurance Companies[1]

	2010		2011		2012		2013	% change year on year
	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	
	End of period, EUR million							
Business and profitability								
Premiums	9,037	16,652	8,935	16,537	8,920	16,341	9,080	1.8
Expenses for claims and insurance benefits	5,757	11,882	6,162	12,826	6,474	12,973	6,509	0.5
Underwriting results	241	373	379	295	345	455	377	9.3
Profit from investments	1,589	3,203	1,930	2,964	1,776	3,391	1,804	1.6
Profit from ordinary activities	552	1,101	1,028	1,162	914	1,395	1,015	11.1
Total assets	102,625	105,099	106,989	105,945	107,824	108,374	109,021	1.1
Investments								
Total investments	95,541	98,300	100,094	99,776	101,917	103,272	103,355	1.4
of which: debt securities	*37,062*	*38,223*	*38,332*	*37,813*	*37,772*	*37,614*	*37,770*	*0.0*
stocks and other equity securities[2]	*12,621*	*12,559*	*12,988*	*12,363*	*12,249*	*12,505*	*12,415*	*1.4*
real estate	*5,193*	*5,703*	*5,120*	*5,236*	*5,201*	*5,371*	*5,522*	*6.2*
Investments for unit-linked and index-linked life insurance	14,477	15,325	15,659	15,870	16,944	18,330	18,483	9.1
Exposure to domestic banks	16,442	16,458	16,925	16,405	17,700	16,872	16,846	−4.8
Custody account claims on deposits on reinsurers	1,229	1,229	1,736	1,733	1,990	1,933	899	−54.8
Risk capacity (solvency ratio), %	×	356	×	332	×	350	×	×

Source: FMA, OeNB.

[1] *Semiannual data exclusive of reinsurance transactions, based on quarterly returns.*
[2] *Contains shares, share certificates (listed and not listed) and all equity instruments held by mutual funds.*

Assets Held by Austrian Mutual Funds

	2009	2010		2011		2012		2013
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	End of period, EUR million							
Domestic securities	48,765	50,587	51,001	51,163	50,046	50,064	50,963	50,576
of which: debt securities	*16,013*	*16,603*	*15,884*	*15,572*	*16,683*	*17,372*	*17,527*	*17,125*
stocks and other equity securities	*2,863*	*2,813*	*3,696*	*3,630*	*2,991*	*3,126*	*3,637*	*3,467*
Foreign securities	89,845	93,102	96,684	93,897	87,458	89,981	96,854	97,538
of which: debt securities	*61,961*	*63,259*	*61,744*	*60,474*	*58,695*	*59,943*	*63,661*	*63,363*
stocks and other equity securities	*12,663*	*12,870*	*15,540*	*14,918*	*12,097*	*12,355*	*14,208*	*14,498*
Net asset value	138,610	143,689	147,684	145,060	137,504	140,046	147,817	148,114
of which: retail funds	*85,537*	*88,227*	*88,313*	*84,132*	*78,299*	*79,430*	*84,158*	*83,342*
institutional funds	*53,073*	*55,462*	*59,372*	*60,928*	*59,205*	*60,615*	*63,659*	*64,772*
Consolidated net asset value	115,337	120,526	123,794	122,398	116,747	120,169	126,831	127,491
Difference to previous cutoff date	8,261	5,189	3,268	−1,396	−5,651	3,422	6,662	660
of which: redemptions and sales[1]	*2,399*	*2,133*	*1,012*	*351*	*−2,117*	*−164*	*1,607*	*1,416*
distributed earnings[1,2]	*1,767*	*705*	*1,696*	*726*	*1,495*	*712*	*1,433*	*733*
revaluation adjustments and income[1]	*7,629*	*3,761*	*3,951*	*−1,021*	*−2,039*	*4,300*	*6,485*	*−21*

Source: OeNB.

[1] *Figures concerning the change in the consolidated net asset value are semiannual figures.*
[2] *Positive values lead to reductions in the consolidated net asset value.*

Structure and Profitability of Austrian Fund Management Companies

	2009	2010		2011		2012		2013
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	End of period, EUR million							
Total assets	642	639	699	635	661	629	644	618
Operating profit[1]	60	64	78	77	48	59	52	61
Net commissions and fees earned[1]	134	149	154	159	125	141	141	152
Administrative expenses[1,2]	97	96	103	96	99	100	105	105
Number of fund management companies	30	30	29	29	29	29	29	29
Number of reported funds	2,182	2,192	2,203	2,205	2,171	2,172	2,168	2,135

Source: OeNB.

[1] *All figures are semiannual figures.*
[2] *Administrative expenses are calculated as the sum of personnel and material expenses.*

Assets Held by Austrian Pension Funds

	2009	2010		2011		2012		2013
	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30	Dec. 31	June 30
	End of period, EUR million							
Domestic securities	11,721	12,482	13,017	13,077	12,576	13,231	13,293	13,334
of which: debt securities	*169*	*163*	*173*	*173*	*140*	*113*	*119*	*110*
mutual fund shares	*11,520*	*12,296*	*12,818*	*12,878*	*12,420*	*13,087*	*13,143*	*13,184*
other securities	*32*	*23*	*26*	*26*	*16*	*31*	*31*	*40*
Foreign securities	1,124	1,117	1,249	1,270	1,289	1,290	2,160	2,318
of which: debt securities	*138*	*148*	*181*	*159*	*173*	*123*	*113*	*100*
mutual fund shares	*932*	*944*	*1,037*	*1,084*	*1,096*	*1,145*	*2,013*	*2,186*
other securities	*54*	*25*	*31*	*27*	*20*	*22*	*34*	*32*
Deposits	539	318	422	294	644	698	575	615
Loans	182	153	137	137	137	139	153	150
Total assets	13,734	14,245	14,976	14,936	14,798	15,541	16,335	16,564
of which: foreign currency	*448*	*424*	*466*	*428*	*416*	*449*	*404*	*418*

Source: OeNB.

Table A31

Assets Held by Austrian Severance Funds

	2009 Dec. 31	2010 June 30	Dec. 31	2011 June 30	Dec. 31	2012 June 30	Dec. 31	2013 June 30
End of period, EUR million								
Total direct investment	884	906	1,004	1,149	1,393	1,405	1,442	1,400
of which: euro-denominated	*866*	*892*	*985*	*1,125*	*1,363*	*1,377*	*1,415*	*1,381*
foreign currency-denominated	*17*	*15*	*19*	*24*	*30*	*28*	*27*	*19*
accrued income claims from direct investment	*15*	*12*	*16*	*15*	*19*	*18*	*22*	*19*
Total indirect investment	1,946	2,278	2,569	2,774	2,891	3,331	3,834	4,281
of which: total euro-denominated investment in mutual fund shares	*1,858*	*2,126*	*2,379*	*2,567*	*2,741*	*3,114*	*3,540*	*3,887*
total foreign currency-denominated investment in mutual fund shares	*88*	*152*	*190*	*207*	*151*	*217*	*294*	*394*
Total assets assigned to investment groups	2,830	3,184	3,573	3,923	4,284	4,713	5,254	5,667

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

	2009 Dec. 31	2010 June 30	Dec. 31	2011 June 30	Dec. 31	2012 June 30	Dec. 31	2013 June 30
Number of transactions in thousand, value of transactions in EUR billion								
HOAM.AT								
Number	676	597	601	539	472	293	311	303
Value	4,769	4,950	4,497	3,730	3,937	6,944	3,030	2,824
System disturbances	4	4	0	1	0	0	1	0
Securities settlement systems								
Number	1,020	1,036	1,034	1,049	1,038	788	862	939
Value	184	230	168	246	193	238	180	178
System disturbances	0	0	0	0	0	1	0	2
Retail payment systems								
Number	302,100	298,100	318,900	337,100	328,600	328,900	359,400	490,170
Value	24	24	25	24	26	27	28	35
System disturbances	14	16	9	2	2	2	2	0
Participation in international payment systems								
Number	13,356	14,802	16,580	17,080	18,660	19,580	21,200	24,032
Value	549	594	570	632	674	723	1,097	850
System disturbances	0	0	0	0	0	0	0	0

Source: OeNB.

Note: Data refer to the respective six-month period.

Notes

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