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EUROSYSTEM

FINANCIAL STABILITY REPORT 32



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.

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

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<http://www.oenb.at/en/Publications/Financial-Market/Financial-Stability-Report.html>

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Call for applications: Visiting Research Program

The Oesterreichische Nationalbank (OeNB) invites applications from external researchers (EU or Swiss nationals) 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 2017 should be e-mailed to eva.gehringer-wasserbauer@oenb.at by May 1, 2017.

Applicants will be notified of the jury's decision by mid-June. The following round of applications will close on November 1, 2017.

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

Reports

The reports were prepared jointly by the Foreign Research Division, the Economic Analysis Division as well as the Financial Stability and Macroprudential Supervision Division, with contributions by Nicolás Albacete, Andreas Breitenfellner, Andreas Greiner, Manuel Gruber, Bernhard Kallinger, Stefan Kavan, Stefan Kerbl, David Liebeg, Peter Lindner, Benedict Schimka, Martin Schneider, Josef Schreiner, Michael Sigmund, Lea Steininger, Eva Ubl, Elisabeth von Pförtl, Karin Wagner, Walter Waschiczek and Daniela Widhalm.

Management summary

International macroeconomic environment: growth outlook remains subdued in many advanced economies

The macroeconomic outlook has been weakening modestly in many advanced economies in 2016. Central banks have provided additional monetary stimulus in response to the subdued outlook for growth and inflation, which has eased monetary and financial conditions.

Macrofinancial conditions in the countries of Central, Eastern and South-eastern Europe (CESEE) have remained broadly favorable in 2016. Moreover, the outlook for the region is robust as economic dynamics have been solid. In the period under review, the situation in Russia and Ukraine improved gradually, whereas Turkey was negatively affected by rising political uncertainty and a decelerating economy. In many CESEE banking sectors, asset quality continued to improve, as the resolution of nonperforming loans (NPLs) progressed and profitability rose.

Corporate and household sectors in Austria: financing conditions remain favorable

In the first half of 2016, Austrian economic growth was fueled by domestic demand. Investment was driven by both equipment and construction investment. In the corporate sector, the recovery of equipment investment increased the demand for financing. But with ample liquidity on firms' balance sheets, external financing volumes still remain well below pre-crisis figures. Lending by Austrian banks to domestic nonfinancial corporations remained muted in the first half of 2016. Firms continued to have substantial liquidity at their disposal. The structure of enterprises' short-term funds changed,

however, with the share of short-term bank loans decreasing. Loans with medium- term and longer maturities, which are most relevant for business fixed investment, continued to expand.

Austrian residential property prices accelerated in the first half of 2016. While property price growth in Vienna – where the strongest increases had been registered in the past years – lost pace, prices accelerated in Austria excluding Vienna.

The growth of housing loans to households, which had accelerated in the second half of 2015, stabilized in the course of this year. As loans expanded at a slower pace than household disposable income, however, household debt fell slightly. The share of variable rate loans in household loans came down gradually, even though loans with fixed interest rates are more expensive. However, variable rate loans are still very popular in Austria, leaving borrowers with considerable interest rate risks.

Austrian financial intermediaries: structural reforms gain momentum in a challenging environment

Throughout 2016, the European financial sector has still faced subdued economic growth and low interest rates. In this challenging environment, increasing pressure on interest margins and legacies of nonperforming loans continue to dampen the profitability outlook. Therefore, Austrian financial intermediaries are continuing their adaptation process and structural reforms to improve efficiency.

These measures are necessary, as operating profit weakened in the first half of 2016. Austrian banks' interest income continues to decline due to lower margins and lower business volumes, while fee and commission income is burdened by weak securities

business, leading to lower operating income. Given that operating expenses rose slightly, operating profits dropped sharply. Nevertheless, compared to 2015, the net profit of the Austrian banking system still increased, owing to further reductions in the flow of credit risk provisions. This opportunity should be used to continue to address structural issues, as constrained operating profitability requires further cost management (including consolidation) in the Austrian banking market.

The transfer of ownership in UniCredit Bank Austria's CESEE subsidiaries to its Italian parent bank in the second half of 2016 has significantly lowered the Austrian banking system's foreign risk exposure. At the same time though, the contribution from CESEE subsidiaries to the overall profitability of the Austrian banking system is expected to shrink by more than one-third. For the remaining subsidiaries, profitability in the first half of 2016 improved considerably year on year due to positive results in Hungary and Ukraine and rising profits in Croatia, the Czech Republic and Slovakia. While the restructuring of UniCredit Bank Austria reduced the total size of the Austrian banking system's NPL portfolio, sizable NPL volumes at some remaining subsidiaries continue to be a burden for their new lending and profitability.

The capital situation of Austrian banks improved markedly in the first half of 2016 due to retained earnings and capital increases, which helped reduce the gap between Austrian banks and their peer groups in terms of their capital ratios. Nonetheless, Austrian banks' capitalization is still perceived as below average and the upcoming phasing-in of new rules will lead to higher minimum requirements.

Two topics are currently in the spotlight of macroprudential policy and are being monitored very closely to assess potential risks to financial stability: First, in the area of foreign currency loans, substantial funding gaps relating to repayment vehicles have been identified in an OeNB survey and should be addressed. Second, the European Systemic Risk Board (ESRB) has issued a warning regarding medium-term vulnerabilities in Austria's residential real estate sector. However, the OeNB currently considers systemic risks from mortgage lending in Austria to be limited, as long as sustainable lending standards – e.g. conservative loan-to-value and debt (service)-to-income ratios – continue to be met.

Like banks, Austrian insurance companies face headwinds from the low interest rate environment, which has caused their liabilities to rise due to lower discount factors and their investment income to decline, as maturing investments are gradually replaced by lower-yielding securities.

Recommendations by the OeNB

Against this background, the OeNB recommends that the following measures be taken:

- Banks need to continue to pursue structural reforms and adapt their business models to further increase operational efficiency.
- Lenders need to consistently comply with sustainable standards in real estate lending, especially in Austria, to prevent the buildup of systemic risks and speculation in residential real estate lending.
- Efforts to reduce remaining NPL volumes should be continued, especially in CESEE, in order to ease the burden from legacy issues and to pave the way for new lending.

- Banks and customers should proactively address funding gaps affecting loans with repayment vehicles. Banks should also continue to fulfill the related supervisory minimum standards.
- Capital levels have improved markedly, but are still below the EU average. Consequently, banks should further strengthen their capital base, also in view of the phase-in arrangements of regulatory requirements.

International macroeconomic environment: growth outlook in advanced economies remains subdued

Sluggish world economy and political uncertainty shape financial conditions

The outlook for the global economy has remained subdued since last spring, with downward revisions in growth for advanced economies, while prospects for emerging market economies have brightened somewhat notwithstanding a further slowdown of international trade. In China, the situation has stabilized despite remaining rebalancing challenges; expansionary policies have kept growth in the targeted range. Firming prices of raw materials, notably crude oil, have improved the outlook for commodity-exporting countries. Advanced economies, however, still racked by weak growth as well as very low inflation and interest rates, face heightened political uncertainties amid a potential backlash to globalization. Monetary policies diverge between exiting and stepping up the very accommodative policy stance, with the U.S.A. and Japan on opposite sides of the range and the euro area in the middle. In Europe, second- and third-quarter data have reconfirmed the feebleness of the recovery, and risks related to credit quality have materialized in the banking sector. The U.K. referendum vote in favor of leaving the EU (Brexit) compounded uncertainties by raising political concerns about the future of European integration amid rising populism and geopolitical tensions. Catching up continues in the economies of Central, Eastern and Southeastern Europe (CESEE), but they are struggling with deflation. CESEE financial markets broadly developed favorably, with the exception of the Turkish financial market.

Weaker conditions in advanced economies partly offset by emerging markets

World economic growth remained subdued and is projected to expand slowly in 2016 and 2017. Defying downward-revised forecasts, in the third quarter, U.S. economic activity picked up at the fastest pace in two years, strengthening the case for renewed monetary policy tightening toward the end of the year. In the euro area, the economic recovery stayed moderate but resilient to the Brexit shock. Up to the third quarter, euro area growth was driven by domestic demand that benefited from an accommodative monetary policy and low energy prices. Economic activity expanded very slowly in Japan but recovered in China within the targeted range amid rising financial imbalances. While risks to the global outlook remain tilted to the downside, persistently low price pressures kept worldwide inflation low. Global merchandise trade stagnated in the first half of 2016, and annual trade growth is expected to be below GDP growth for the first time in 15 years, mainly due to the decline in imports by developing and emerging economies. More recent data, however, pointed to a strong acceleration in global trade in the fourth quarter. Monetary policy action taken by central banks continues to exert an important impact on financial markets. Bond yields generally stabilized at very low levels in advanced economies. Global stock markets recovered from the sharp decline in January. Over the first ten months of 2016, stock market indices posted gains in the U.S.A. and the U.K. but losses in Europe, Japan and China.

Resilience in the
U.S.A. and U.K.,
fragile growth in
Japan, rebalancing in
China

U.S. GDP grew by an unexpected (annualized) 2.9% in the third quarter of 2016, twice the speed of the previous quarter. The expansion was mainly powered by personal consumption expenditures, but exports, inventory building, federal government spending, and nonresidential investment also contributed positively. Unemployment, however, marginally increased to 5.0% in September, although hours worked and wages rose. Inflation as measured by personal consumption expenditures rose to 1.2% in September. The IMF revised its forecasts for 2016 and 2017 down to 1.6% and 2.2%, respectively, in view of weak (energy) investment, a relatively stronger (trade-weighted) U.S. dollar exchange rate and global risks. The Federal Reserve (Fed) paused its exit from the accommodative monetary policy that it had started in December 2015; it kept the federal funds rate at 0.5% to help achieve its goals of maximum employment and 2% inflation. Given improving data, the Fed is expected to take a further tightening step toward the end of 2016. On November 10, 2016, ten-year U.S. Treasury yields reached the highest level since the beginning of the year as uncertainty over the U.S. presidential election turned into growth optimism, lowering the demand for safe-haven assets.

The Japanese economy grew by 0.2% in the second quarter (quarter on quarter) after bouncing back 0.5% from a contraction in the last quarter of 2015. Apart from a leap-year gain in consumer spending in the first quarter, weak growth reflected external demand driven by a 10% appreciation of the Japanese yen, low corporate investment and the mid-run trend of a shrinking workforce. September figures for Japan's manufacturing output and retail sales suggest a lukewarm expansion in the third quarter of 2016. In

September, the unemployment rate also declined to 3.0%, and consumer price inflation stayed at -0.5% – in negative territory for the seventh month straight. According to the slightly upgraded IMF forecast, GDP growth in Japan is expected to remain fragile at 0.5% in 2016 and 0.6% in 2017, despite additional government spending, a further postponement of the planned value added tax hike and continued monetary easing, including a -0.1% key interest rate and annual asset purchases of JPY 80 trillion (USD 763 billion). Not taken into account were additional stimulus measures of the Bank of Japan (BoJ) taken since the summer: The BoJ doubled purchases of exchange-traded funds; more importantly, it intends to control interest rates over the whole yield curve across different maturities and to target ten year government bonds yields at 0%; and finally, it is committed to temporary inflation overshooting beyond the medium-term target. Later, however, the BoJ announced a further delay of the expected attainment of its 2% inflation target to March 2019 as well as sales of longer-dated bonds meant to increase their (currently negative) yields.

Chinese GDP expanded at annualized 6.7% in the third quarter, unchanged from the first half of 2016 and matching expectations, although policy support has faded out. Consistent with China's transition to a sustainable growth path, the expansion in the service and agricultural sectors accelerated at the cost of industry and construction, alongside sharply slowing exports in September. Nominal GDP growth accelerated to the fastest pace it has posted since 2014, particularly in the overindebted industry sector. Producer price deflation came to an end with the first (albeit minimal) price increase since January 2012. Chinese CPI

inflation rose to 1.9% in September 2016. The IMF projects an expansion of 6.6% this year and 6.2% in 2017 for China's economy. Still unusually high credit growth and debt service ratios as estimated by the Bank for International Settlements point to potential concerns. In September 2016, several municipalities imposed restrictions on buying real estate and mandated higher mortgage down payments to cool down overheated property markets. In October 2016, measures to facilitate corporate debt restructuring were announced, including the establishment of a USD 50 billion fund. In line with growth rebalancing, the current account surplus is projected to decline to 2.5% of GDP in 2016 (down from 3% in 2015) as imports and outbound tourism increase. In September 2016, China's foreign exchange reserves declined gradually to USD 3.2 trillion from their all-time high of USD 4.0 trillion in 2014 as capital outflows related to repayment of external debt moderated in 2016. Since February 2016, the Chinese renminbi (RMB) has depreciated by some 7.3% from close-to-peak levels, as it is broadly in line with fundamentals. Since its latest interest rate cut in October 2015, the People's Bank of China (PBoC) has left the base interest rate unchanged at 4.35%. Having met all conditions for being freely usable, the RMB was added to the IMF's Special Drawing Right (SDR) currency basket in October 2016, where it was given the third-largest weight, about 10.9%.

After the U.K. had voted to leave the EU in June 2016, its GDP growth dropped to 0.5% in the third quarter, remaining stronger than forecast but down from 0.7% in the previous quarter. The strong performance of the service sector and consumption kept the economy resilient, whereas industrial

production and construction contracted. The unemployment rate tumbled to 4.9%, and the employment rate is close to record levels, yet productivity growth is slow, partly related to the troubled oil and finance industries. Wages increased slowly but faster than inflation, growing by 1% in September 2016. However, price pressure is rising in line with the depreciation of the pound sterling (22% lower against the euro compared to the beginning of 2016). The Bank of England reacted to the EU referendum by easing its key interest rate to 0.25%. Although financial market reaction to the EU referendum has been contained, the IMF marked down its forecast for U.K. growth to 1.8% for this year and 1.1% in 2017. It also reduced medium-term projections, as the rising uncertainty and the likely thinning of economic flows between the U.K. and the EU are expected to weigh on growth potential.

Moderate recovery with modest inflation in the euro area

Even with the Brexit referendum, the cyclical recovery in the euro area continues to exhibit resilience, albeit at a lackluster pace. Real GDP rose by 0.3% in the third quarter of 2016. As in the second quarter, growth was backed by consumption, residential real estate investment and, to a lesser extent, business investment, whereas foreign demand remained weak. Unemployment has stagnated at 10.1% since April despite robust employment growth. Credit growth is held back by high non-performing exposures faced by banks in a number of countries alongside the challenges of low profitability and overcapacity in a low interest rate and growth environment. HICP headline inflation turned positive in June, but its increase to 0.5% in October was very gradual, given a diminishing drag from

ECB continues
 standard and
 nonstandard
 monetary policy
 easing

energy prices and some upward pressure from past euro exchange rate depreciation. Underlying inflation, however, still declined due to low wage growth. Long-term market-based inflation expectations recovered, but remain at extremely low levels. On a positive note, a number of near-term political risks appear to have abated: Spain avoided a third election by forming a minority government; the Greek government continued compliance with the third assistance program although the IMF conditioned its participation on a further debt restructuring; receding flows of migrants relieved some pressure; and a free trade agreement between Canada and the EU was passed. Uncertainty is nonetheless nurtured by the U.S. presidential election results, signaling possible damage to trade, a critical referendum in Italy on Senate reform in December 2016 that

threatens political stability and recent remarks from U.K. and EU politicians pointing to a “hard” Brexit that would leave the U.K. cut off from common market access. Growth is projected to decline slightly to 1.7% in 2016 and 1.5% in 2017 – still higher than demographically driven medium-term potential growth.

Euro area fiscal policy has been broadly neutral, while monetary policy has stayed very accommodative, both for standard and nonstandard measures. Since March 2016, the ECB’s Governing Council has maintained the Eurosystem’s policy interest rates at 0% (main refinancing operations) and its deposit facility rate at –0.4%. It expects rates to remain at those or lower levels for an extended period of time. Among nonstandard monetary policy measures, the Eurosystem started its corporate sector purchase program

Chart 1

Eurobond spreads in selected emerging market regions

Euro EMBIG spread in basis points



Source: Bloomberg.

Note: EMBIG = Emerging Markets Bond Index Global.

(CSPP) as well as its new series of targeted longer-term refinancing operations in June 2016. The ECB repeatedly stated that it would continue its monthly asset purchases of EUR 80 billion until the end of March 2017 or beyond, if necessary, dependent on a sustained adjustment of inflation consistent with its inflation aim of below, but close to, 2% over the medium term. It also announced that it would assess options to ensure the smooth implementation of the CSPP, given a scarcity of eligible assets. Markets took some comfort from the announcement by ECB President Draghi that a “sudden stop” of monetary easing was “unlikely” and calmed somewhat, after having experienced some volatility in the run-up to the U.S. presidential election: German ten-year government bond yields re-entered positive territory; long-term inflation expectations increased to more than 1.5%; and yield spreads in Portugal and Italy widened against those in Germany, but narrowed against those in Spain. In the third quarter, financial conditions for housing loans improved further in the euro area, and external financing to nonfinancial corporations gradually firmed. Bank equity, however, remains depressed despite some recovery over the past few weeks. With lending rates declining further, banks face reduced margins not just on new lending, but also on existing loans.

Since mid-2016, the exchange rate of the euro has hovered around USD/EUR 1.1, but it started to weaken against the U.S. dollar and strengthen against the Japanese yen still close to its three-year low. The euro also broadly maintained its value in nominal and real effective terms against a trade-weighted basket of currencies amid high but diminishing current account surpluses in the euro area. The euro gained only against the pound sterling,

rising by around 22% in the first ten months of 2016. So far, the Swiss franc exchange rate to the euro has been impacted marginally by the Brexit referendum and the U.S. presidential election due to safe-haven effects. Partly, tactical currency interventions carried out by the Swiss National Bank have prevented the Swiss franc’s value from rising against the euro. By November 10, 2016, the representative stock index DJ Euro Stoxx had lost around 6.7% against the value recorded at end-2015, mirroring similar developments in China and Japan. In contrast, the U.S. Dow Jones Industrial Average and the British FTSE-100 Index overcompensated the losses they had suffered from the Chinese equity slump in January 2016. Euro area sovereign bonds remained generally strong over the review period. Given monetary easing and the subdued inflation outlook, yields on ten-year government bonds were down by roughly 30 basis points or more compared to early 2016, with the exception of the yields of the respective Italian, Portuguese and Cypriot securities, which saw increases. Since the second quarter, Brent crude oil prices had oscillated around USD 50 per barrel, tending to weaken toward the end of the review period as a result of a likely failure of OPEC and other oil exporters to agree on supply limits.

CESEE: banking sectors benefit from stable macrofinancial environment

The CESEE regional risk assessment remained broadly favorable in the review period: Euro-denominated Euro-bond spreads for Eastern Europe remained below the respective figures for other emerging market regions. CESEE spreads fluctuated around 170 basis points throughout the first half of the year and reached a peak after the U.K.’s

vote to leave the EU in June. However, the situation improved substantially in July and August against the background of favorable global liquidity conditions: Brexit put downward pressure on global interest rates, as monetary policy is now expected to remain accommodative for a longer time.

Broadly stable
macrofinancial
environment across
most of the CESEE
region

In the CESEE EU Member States of the country sample (Bulgaria, the Czech Republic, Croatia, Hungary, Poland, Slovakia and Slovenia), most financial market segments developed positively. Equity prices trended up, and Eurobond spreads and credit default swap (CDS) premiums were mostly lower in mid-October 2016 than at the beginning of the year. Currencies displayed some volatility against the euro but appreciated compared to January 2016. The momentum was underlined by rating upgrades: Fitch and S&P raised their ratings for Slovenia against the background of positive government deficit and debt developments. Both agencies also upgraded Hungary's rating, reflecting a sharp improvement in Hungary's external balance sheet and a reduction of vulnerability, the gradual decline in government debt and in the external and foreign currency component and an improvement in the banking sector's overall situation. Positive real economic developments framed financial market trends: Although growth in the CESEE EU Member States experienced a temporary setback especially in the first quarter of 2016, as investments suffered from lower inflows of EU funds, economic output accelerated again in the second quarter of 2016, bringing average growth back to a robust 3.2%.

Gradual improve-
ment in Russia and
Ukraine

Financial markets and economic activity also improved in Russia and Ukraine. In Russia, the ruble recovered from its trough in early 2016, and Eurobond spreads as well as CDS premiums declined (by some 150 basis points

between early 2016 and mid-October 2016). Furthermore, the contraction of the Russian economy slowed down considerably in the review period. Price pressure eased due to persistent weak demand, the shrinking ratio of imports to GDP and the Central Bank of Russia's (CBR) continuing tight monetary policy (holding the repo auction rate at 11% until June 2016). Disinflation finally provided room for two rate cuts: The CBR lowered its policy rate to 10.5% in June and cut it to 10% in September. Net private capital outflows shrank to USD 10 billion from January to August 2016 (compared to USD 51 billion from January to August 2015). Capital outflows shrank, largely owing to reduced debt service payments and to the repatriation of assets from abroad. Russia's total external debt remained more or less stable in the first half of 2016, coming to USD 525.3 billion at mid-2016 (43% of GDP). The improving general economic situation is substantiated by rating actions: Fitch revised the outlook on its BBB- rating from negative to stable, as the country has implemented a "coherent and credible policy response" to the fall in oil prices.

Following a deep recession in 2014 and 2015, economic activity in Ukraine grew by 0.8% in the first half of 2016. After peaking at 60.9% in April 2015, inflation trended downward to 7.9% in September 2016. Moreover, disinflation allowed the central bank to cut its key policy rate in several steps to 14% in October 2016 from 22% at end-2015. Throughout this period, the Ukrainian hryvnia traded broadly stable against the euro. Fiscal consolidation, energy and banking sector reforms as well as the fight against corruption paved the way for a completion of the second review under the IMF Extended Fund Facility (EFF) in Sep-

tember 2016. The IMF points out that notwithstanding the overall headway made in implementing the program, political resistance slowed down progress in tackling corruption, privatizing state-owned enterprises and advancing the pension reform. The conclusion of the second review enabled the disbursement of the third tranche of USD 1 billion, bringing total disbursements under the EFF to about USD 7.6 billion (out of USD 17.5 billion). Moreover, Ukraine issued a USD 1 billion U.S. guaranteed Eurobond in September 2016. As a result, foreign currency reserves rose to USD 15.6 billion (equivalent to 3.9 months of imports) in September 2016. Since the successful de-escalation of the conflict in parts of eastern Ukraine in the course of 2015, the situation has remained broadly unchanged, with regular ceasefire violations along the contact line.

Among the non-EU countries of the region, Turkey stands out with its development in the review period. The risk assessment of the country deteriorated markedly after the failed military coup on July 15, 2016. CDS premiums and Eurobond spreads increased strongly, and the Turkish lira lost 5% against the euro within a week following the attempted coup. S&P lowered Turkey's sovereign debt rating from BB+ to BB on July 20, 2016, warning that rising political uncertainty could scare off investors and undermine fiscal management. On September 23, 2016, Moody's also cut Turkey's sovereign debt rating to non-investment grade (from Baa3 to Ba1), citing rising risks related to the sizable external financing needs and a deterioration of the country's credit profile. In the aftermath of the downgrade by Moody's, the Turkish lira again embarked on a depreciation trend. In mid-November 2016, it traded 8.1% lower against the euro

than at the beginning of 2016. The general economic momentum of the country was already decelerating before the attempted coup, as ongoing economic downturns in major trading partners (e.g. Iraq), economic sanctions imposed by Russia as from January 2016 and a sharp deterioration in the tourism sector weighed on growth.

The Central Bank of Republic of Turkey (CBRT) adopted several measures after the attempted coup with the aim of preserving financial stability. At the same time, the CBRT continued its rate-cutting cycle and reduced the overnight lending rate in five steps from 10.50% in April to 8.25% in September 2016. This narrowed the interest rate corridor around the main policy rate (one-week repo lending rate at 7.5%), as the lower band (overnight borrowing rate) remained unchanged at 7.25%.

The development of domestic credit to the private sector (nominal lending to the nonbank private sector adjusted for exchange rate changes) was somewhat heterogeneous in the review period. Among the EU Member States, the Czech Republic and Slovakia showed the highest credit growth at 7.9% and 10%, respectively, in September 2016. While the dynamics were broadly unchanged in Slovakia, credit growth decelerated somewhat in the Czech Republic as corporate credit growth lost speed. Because solid credit developments in both countries were fueled by favorable expectations for general economic developments and a sound liquidity position, local supervisors stipulated a countercyclical capital buffer as of 2017. Furthermore, both countries' banking sectors are in healthy shape.

Credit growth was also rather swift in Poland. Key indicators of the country's banking sector, however, are

Turkey negatively affected by the failed military coup

Credit developments heterogeneous in the CESEE EU Member States

somewhat weaker than those in Slovakia and in the Czech Republic. For example, the country still reports a substantial share of foreign currency loans (especially Swiss franc loans) in total loans. The discussion about a conversion of those loans is ongoing, adding to banking sector uncertainty. Furthermore, a bank asset tax in effect since February 2016 could well dent banks' profitability and capital ratios in the future. Bank lending has already softened moderately in recent months.

In Romania, credit growth was positive throughout the review period but declined to close to zero in August. Especially corporate credit dragged down credit growth, while household credit actually accelerated. Progress in shoring up the banking sector has been made in recent years, especially in the areas of nonperforming assets and the refinancing structure. Foreign currency-denominated lending trended down as well, but generally remained at a high level. The law on debt discharge in effect since mid-May (allowing retail mortgage borrowers to return real es-

tate collateral to banks in exchange for writing off their loans) might have negative implications for banks' profitability and capitalization.

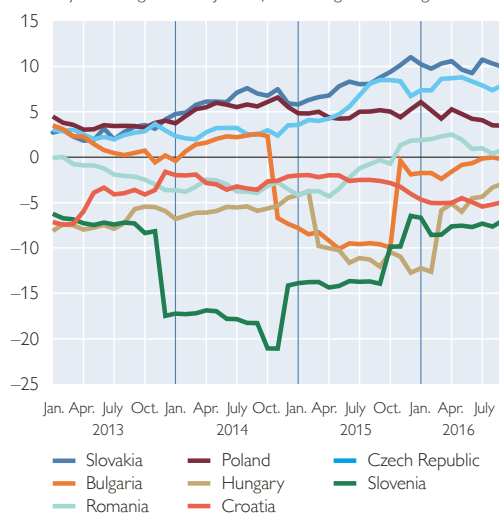
The contraction of the credit stock in Bulgaria ground to a halt in August 2016. The development was driven by the extension of new loans in both the corporate and the household segment. At the same time, the continuous optimization of bank portfolios weighed on the credit stock, as bad and restructured loans posted a notable decline. The Bulgarian banking sector reports a comparatively high but declining share of credit denominated in foreign currency.

The credit stock continued to decrease in Hungary, Croatia and Slovenia in the review period. Especially in Hungary, however, the contraction moderated. This was in part related to a statistical effect: The conversion of foreign currency loans to households at an exchange rate below the prevailing market exchange rate in the first quarter of 2015 dropped out of the base. Furthermore, both household and corporate

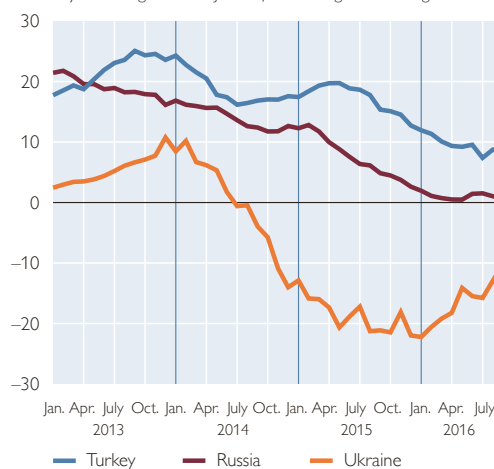
Chart 2

Growth of credit to the private sector

Year-on-year change in %, adjusted for exchange rate changes



Year-on-year change in %, adjusted for exchange rate changes



Source: ECB, national central banks.

loans displayed somewhat more favorable momentum in recent months, partly owing to central bank measures (Funding for Growth Scheme and Growth Supporting Programme).

In Croatia, the corporate sector saw a reduction in debt to domestic credit institutions but an increase in borrowing from abroad. The development of household debt was largely influenced by the conversion in late 2015 of Swiss franc loans into euro loans at historical exchange rates. According to the Croatian National Bank, household loans in Swiss francs and household loans indexed to Swiss francs stood at HRK 21.7 billion at the end of November 2015 and at HRK 1.6 billion at the end of August 2016, respectively. Nevertheless, the share of loans denominated in foreign currency (predominantly euro) remains high. The loan conversion could have longer-lasting effects, as the EU has assessed the measures as “disproportionate.” Several banks are preparing or have already filed lawsuits against the government.

In Slovenia, credit to households expanded moderately. This rise, however, was not sufficient to offset the effect of strongly contracting corporate credit on private sector credit growth. Nevertheless, the country made some progress in cleaning up balance sheets, raising banking sector profitability and improving capitalization.

Among the non-EU Member States of the country sample, Turkey and Russia exhibited slowing credit growth. In Turkey, loan growth had been declining since mid-2015 and came down to 7.4% in July before picking up somewhat again to 9% in September 2016 (year on year). Macroprudential measures adopted in previous years impacted especially on household credit.

In Russia, banks’ caution in providing credits was largely due to the persistent weakness of the economy (even if the recession is fading) and notably to the still ailing credit quality.

In Ukraine, credit developments displayed a somewhat more favorable momentum as the contraction in both household and corporate credit eased. The credit stock, however, continued to decline in the review period. Ukrainian authorities are working on legislation to guide the restructuring of foreign currency mortgage loans. The framework principles (voluntary approach, focus on financial condition of borrowers, only applicable for primary residence) appear reasonable overall, but it is not clear how stringent legislation will be or which incentives banks will get to restructure loans. Costs for banks are estimated to not exceed USD 370 million (0.4% of GDP or 0.6% of banks’ total assets and 10% of core capital).

Lending surveys clearly indicated a pickup of credit demand in the CESEE region. The most recent CESEE Bank Lending Survey of the European Investment Bank (EIB)¹ found that demand for loans improved across the board in the first half of 2016, the sixth consecutive semester of favorable developments. All factors influencing loan demand made a positive contribution. Access to funding also continued to ease in the CESEE region and was supported by easy access to domestic sources, mainly retail and corporate deposits. The development of supply conditions, however, was less straightforward, as already observed in the second half of 2015. Credit standards continued to ease for loans to consumers as well as to corporates. However, the regulatory environment and banks’ capital constraints adversely affected

Lending surveys indicate a rise in credit demand

Weak momentum of credit growth in Russia, Ukraine and Turkey

¹ <http://www.eib.org/infocentre/publications/all/cesee-bls-2016-h1.htm>.

supply conditions. Nonperforming loans (NPLs) are also consistently cited as a drag on supply in the EIB survey.

In the second half of 2016, banks expect demand to continue to increase robustly. However, supply conditions are expected to improve significantly less. As a result, the demand-supply gap is likely to widen.

Country-level bank lending surveys reported mixed findings that only partly support this general picture. A positive development of supply and demand conditions was found only in Hungary and the Czech Republic. In the other countries, lending standards remained unchanged or were tightened, depending on the particular loan segment. Demand for consumer loans has been increasing in most countries, while demand for corporate loans and housing loans was stable or in some cases weaker.

Analyzing the operation of international banking groups in the region, the EIB survey found that 27% of banking groups continued to reduce their total exposure to the region in the first half of 2016. However, this negative trend

seems to be bottoming out, as more and more groups expect exposure to stabilize over the second half of 2016. While cross-border banking groups continue to discriminate in terms of the countries of operation as they reassess their country-by-country strategies, they are also increasingly signaling their intentions to expand operations selectively in the region. The survey also found that roughly 70% of groups describe the profitability of CESEE operations as outperforming the profitability of the group as a whole. Under special topics, this issue of the Financial Stability Report includes a detailed analysis of the profitability of Austrian subsidiaries in the CESEE region.

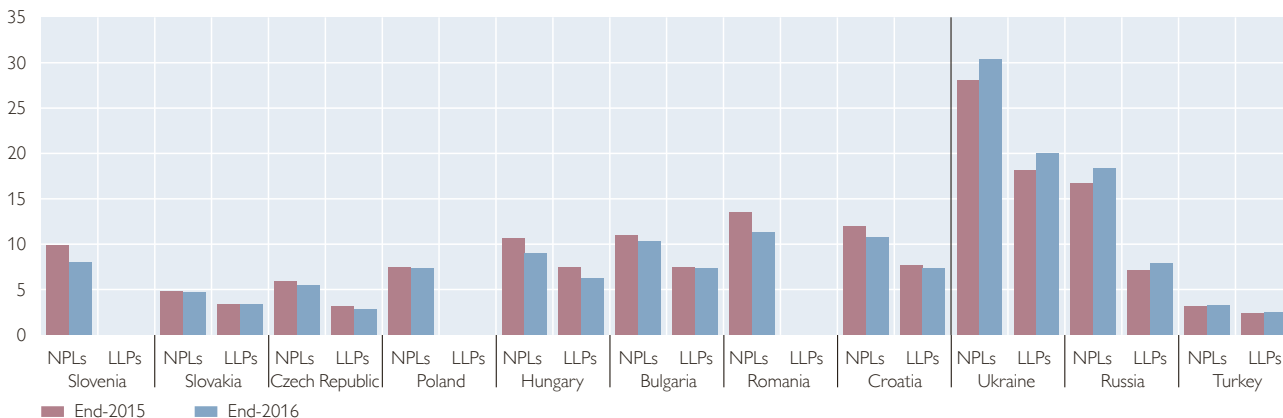
NPL resolution progressed in the review period. All CESEE EU Member States reported a reduction in NPL ratios. The decrease was especially strong in Slovenia. The country's NPLs declined to 8% of total credit in mid-2016 from 11.6% a year earlier against the background of a further transfer of bad claims to the Bank Asset Management Company, increased write-offs as well as restructuring and forbearance

NPL resolution progresses

Chart 3

Banking sector: credit quality

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



Source: IMF, national central banks, OeNB.

Note: Data are not comparable between countries. NPLs include substandard, doubtful and loss loans, except for Ukraine (doubtful and loss loans) and for Romania and Slovenia (in arrears for more than 90 days).

agreements. Credit quality improved notably also in Bulgaria, Croatia, Hungary and Romania due to banks' active portfolio cleansing (including sales of NPL portfolios). In Bulgaria, this happened against the background of an asset quality review and stress test based on financial data from end-2015.

Russia and Ukraine reported a strong increase in NPL ratios, as the general economic situation remained challenging. In Turkey, the share of NPLs in total loans increased somewhat but remained at a comparatively low level, with the provision coverage ratio coming to around 75%.

Banking sector profitability improved in all countries of the region as portfolio quality improved. In the CESEE EU Member States, the return on assets increased to between 1% in Poland and 2.1% in Hungary in June 2016. The improvement was especially pronounced in Croatia, Hungary and Slovenia; in all three countries, the return on assets doubled from mid-2015 to mid-2016. In Croatia, the conversion of Swiss franc loans impacted negatively on profitability in 2015. As this one-off factor faded, the return on assets improved quickly and increased to 1.5% on the back of rising income. In Slovenia, higher profitability was helped by the decline in provisioning and value adjustments and by improvements in noninterest income. The former was again linked to the improvement in banks' asset quality. In Hungary, both operating income and other income posted better results.

Returns also improved in Ukraine, Russia and Turkey. In Ukraine, however, profitability remained negative at mid-2016 on the back of still substantial (though noticeably lower) provisioning and write-offs. In Russia, profitability has reappeared owing to the slow recovery of interest rate margins and to inten-

sified cost control measures. In Turkey, the return on assets rose further from an already high level on the back of higher income and somewhat lower costs.

Capital adequacy ratios remained high and broadly stable in most of the countries under review in mid-2016. In the CESEE EU Member States, they ranged between 17.3% in Slovakia and 22.7% in Bulgaria. In August 2016, the Bulgarian central bank released the results of an asset quality review and stress test for the whole banking sector. The stress test confirmed that the Bulgarian banking sector remains well capitalized. The asset quality review will lead to additional adjustments of BGN 665 million (1.3% of risk-weighted assets of the Bulgarian banking sector) that will be reflected in banks' 2016 financial statements.

In the non-EU Member States of the country sample, capitalization was notably lower (between 12.4% in Russia and 15.3% in Turkey). Especially Ukraine, however, managed to improve its capital base substantially: The capital adequacy

Most CESEE banking sectors remain well capitalized...

...and profitability is rising

Chart 4

Banking sector: profitability

Return on assets (RoA) in %



Source: IMF, national central banks, OeNB.

Note: The data are not comparable across countries. They are based on annual after-tax profits, except for Russia's data, which are based on pretax profits.

Funding gaps stay moderate in most CESEE countries

ratio increased to 13% in June 2016, up from only 9% a year earlier on the back of lower risk-weighted assets and recapitalization efforts.

The refinancing structure of CESEE banking sectors has increasingly shifted toward domestic deposits over the past few years. This is especially true for the CESEE EU Member States that had no substantial gap or a negative gap between total outstanding domestic claims and total domestic deposits (relative to GDP) at mid-2016. Funding gaps in this region were still broadly unchanged in the review period. Only Slovenia reported a notable decline. The overhang of deposits over claims increased by 3.7% of GDP between end-2015 and mid-2016 as claims sustained their downward trend and deposits edged up marginally.

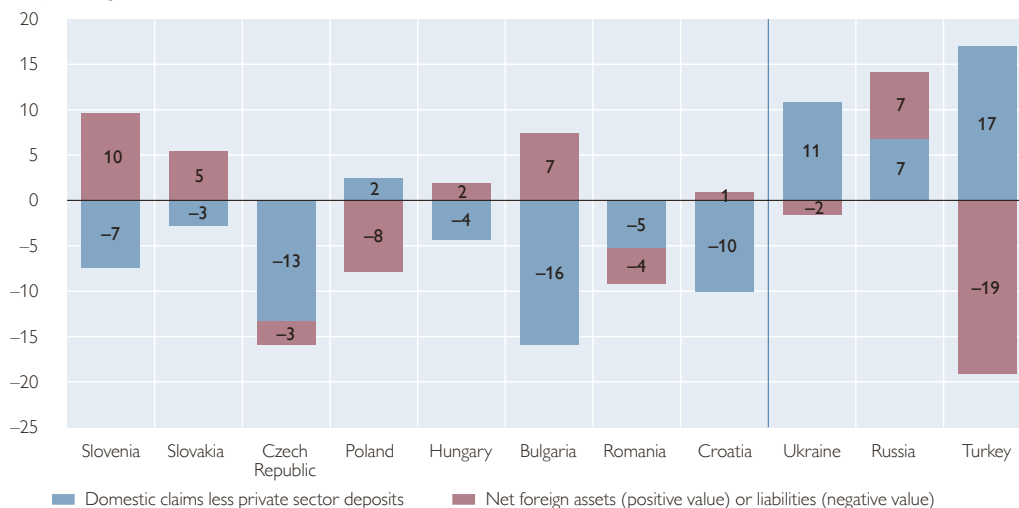
Compared to the EU Member States, Russia exhibited a somewhat larger funding gap; the gap was substantially larger in Ukraine and Turkey. While the gap remained broadly unchanged in Russia and Turkey, it decreased notably in Ukraine against the background of continued deleveraging.

The banking sectors of five of the eleven countries under observation reported net external liabilities at mid-2016, mostly ranging between 2% and 8% of GDP. Only Turkey recorded substantially higher net external liabilities. Despite its negative funding gap, the Czech Republic's banking sector became a net debtor in the review period. At the same time, the Hungarian bank sector managed to switch from a debtor to a creditor position.

Chart 5

Banking sector: gap between claims and deposits, and net external position

As a percentage of GDP at mid-2016



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

Corporate and household sectors in Austria: financing conditions remain favorable

Nonfinancial corporations: financing volumes rebound slightly

Corporate profits recover further

Economic growth in Austria in the first half of 2016 was driven by domestic demand, while net exports dampened growth. Investment contributed positively to growth, driven by both equipment and construction investment. Domestic demand benefited from two special factors: the tax reform and expenditures for refugees. Strong employment growth and low inflation were additional factors supporting private consumption.

Reflecting the slight upturn in economic growth, the gross operating surplus of nonfinancial corporations continued to recover, posting a year-on-year increase of 0.9% in real terms in the second quarter of 2016 (see chart 6). In nominal terms, the gross operating surplus was up 2.6% year on year. On top of the support provided by economic activity, the cost side of firms was contained by moderate wage growth as well as low oil and other commodity prices. Over the past two

years, gross operating surplus moved in line with gross value added so that profitability (as measured by gross operating surplus divided by gross value added), which had been on a downward trend between the onset of the crisis and 2014, stabilized. In the second quarter of 2016, the gross profit ratio amounted to 41.3%, unchanged compared to end-2015. But despite this stabilization, the profit ratio is still well below pre-crisis levels. Moreover, the low interest rate environment has reduced the interest rate burden of indebted nonfinancial corporations (see below). Overall, increased profitability has augmented the internal financing potential of the corporate sector.

External financing of nonfinancial corporations rebounds

The recovery of investment in machinery and equipment increased corporate demand for external financing. Nonfinancial corporations' recourse to external financing picked up somewhat in the first half of 2016 and, at EUR 7.9 billion, was up 12.7% compared to the value of the first half of last year. Despite this upturn, financing volumes still remained well below pre-crisis figures, reflecting ample liquidity on the asset side of firms' balance sheets.

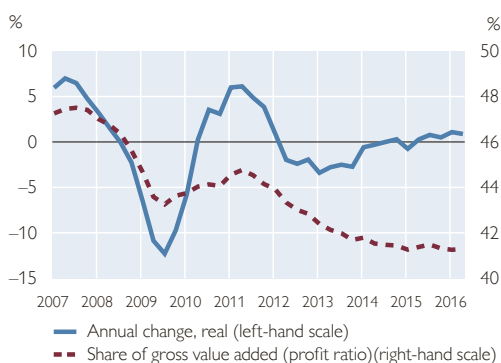
Equity and debt contributed to total external financing in roughly equal measure in the first half of 2016 (see chart 7). Their dynamics, however, differed. At EUR 3.8 billion, equity financing (issuance of both quoted and unquoted shares) was about 15% lower than in the first half of 2015. The net issuance of listed shares, which slumped to a mere EUR 8 million, accounted for this slowdown. In 2016 so far, there has been no new listing on the Vienna stock exchange. Thus, virtually all equity

Economy recovers after four years of weak growth

Equity accounts for close to half of external financing

Chart 6

Gross operating surplus of nonfinancial corporations¹

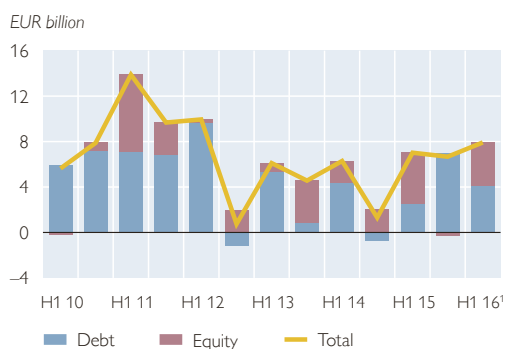


Source: Statistics Austria.

¹ Moving four-quarter sums.

Chart 7

External financing of nonfinancial corporations



Source: OeNB.

¹ Preliminary data.

financing came from other equity instruments (mainly sales to foreign strategic investors). The equity share in total outstanding liabilities fell slightly to 46.6%.

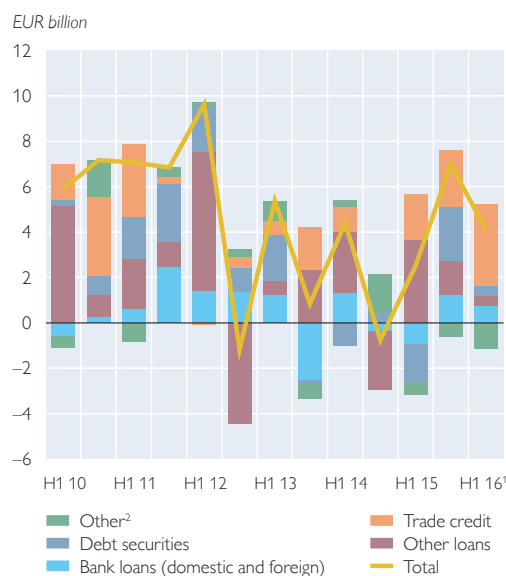
Debt financing starts to recover

Compared to the first six months of 2015, debt financing rose by almost two-thirds (62.3%) to EUR 4.1 billion. However, this increase fell short of the semiannual values recorded before 2014 (see chart 8).

Other nonfinancial corporations (both domestic and foreign) were again the primary source of debt financing of the Austrian corporate sector in the first half of 2016. Mostly, this financing took the form of trade credit, which accounted for more than three-quarters of total debt financing – despite the fact that this form of finance is comparatively more expensive in a low interest rate environment. One reason for the large share of trade credit might be that as a key element of firms' working capital, trade credit develops broadly in line with the business cycle. Partly

Chart 8

Debt financing of nonfinancial corporations



Source: OeNB.

¹ Preliminary data.² Pension entitlements and other accounts payable.

because of the large recourse to trade credit, debt financing was primarily short-term (with a maturity of less than one year). Loans from other enterprises, which mostly reflect transactions within corporate groups, played a minor role in the first six months of 2016.

Bank loans contributed more than one-third to debt financing in the first half of 2016, and more than one-third of these loans were from foreign banks.¹ However, a significant part of the loans from foreign banks can be attributed to a limited number of very large transactions. In terms of outstanding amounts, loans from foreign banks contributed little more than 10% to total bank lending to the corporate sector at mid-2016.

¹ Not adjusted for reclassifications, valuation changes and exchange rate effects.

Overall, lending by Austrian banks to domestic nonfinancial corporations remained muted. In September 2016, the annual growth rate (adjusted for reclassifications, valuation changes and exchange rate effects) amounted to 0.5% in nominal terms (see left-hand panel of chart 9).² However, loan dynamics diverged considerably by maturity. Loans with medium-term and longer maturities (over one year), which are most relevant for business fixed investment, continued to expand, growing by 2.9% annually in September 2016, while short-term loans (with maturities of up to one year), which have been substituted in recent years by other forms of short-term funding, decreased from early 2015.

In the first three quarters of 2016, Austrian banks continued their cautious lending policies and tightened their credit standards for loans to enterprises somewhat, according to the euro area bank lending survey (BLS; see right-hand panel of chart 9). Credit policies did not differ much by maturities. Respondent banks attributed their tighter standards primarily to reduced risk tol-

erance. Moreover, they indicated costs related to their capital position and risk related to the collateral demanded. In contrast, other factors reflecting banks' risk perception, such as their assessment of the general economic situation and of borrowers' creditworthiness, which had been named frequently in the past, played a minor role in recent survey rounds. Thus, especially firms with poor credit ratings and higher insolvency probabilities may have experienced increased difficulties in obtaining a bank loan.

At the same time, loan demand by enterprises remained weak, reflecting the current cyclical environment, although in the second and the third quarters of 2016, the banks surveyed in the BLS reported a slight pickup in corporate loan demand after a prolonged period of falling demand. Banks named merger and acquisition activities as well as debt restructuring and renegotiations as the main factors behind this slight uptick, while internal financing and funding requirements for fixed investment dampened loan demand.

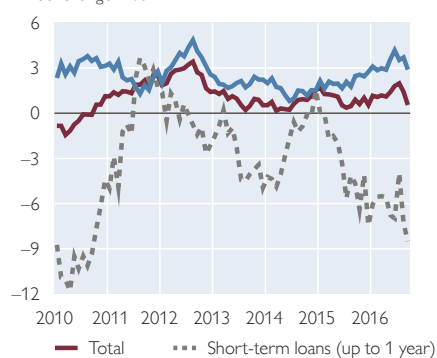
Longer-term bank loans grow briskly

Chart 9

MFI loans to nonfinancial corporations

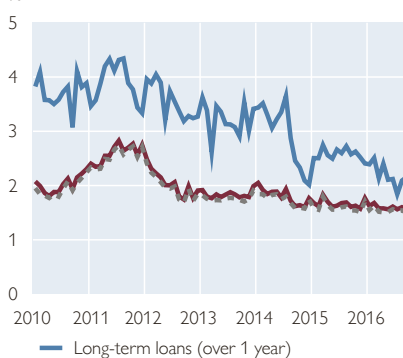
Volumes

Annual change in %



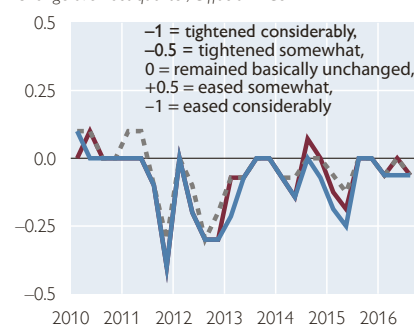
Interest rates

%



Credit standards

Change over last quarter, diffusion index



Source: OeNB.

² At the cutoff date, financial accounts data were available up to the second quarter of 2016. More recent developments of financing flows are discussed on the basis of data from the MFI balance sheet statistics and the securities issues statistics.

Growing liquidity buffers

Moreover, firms continued to have at their disposal substantial liquidity. Short-term funding of nonfinancial corporations, defined as trade credit and short-term loans (both from banks and other sources, mainly intercompany loans), rose by 5.3% year on year in the second quarter of 2016 (see chart 10, left-hand panel). The structure of the outstanding short-term funds has changed, however. The share of short-term bank loans decreased (by about 5 percentage points from end-2014 to one-third) in favor of trade credit, whose share rose (by roughly 5 percentage points to one-half). Yet, this decreased recourse to short-term bank loans does not necessarily signify impaired access to bank financing, as the development of credit lines extended to nonfinancial corporations suggests. According to the OeNB's statistics on new lending business, the total amount of undrawn credit lines available to enterprises rose by EUR 10 billion or 60% from end-2010 to mid-2016, much more strongly than the overall volume of credit lines. This implies a significant increase in unutilized liquidity that enterprises could draw if

necessary (see middle panel of chart 10). Additionally, firms' overnight deposits continued to rise in 2016 (+13.6% year on year in September 2016). While these liquidity buffers may reflect both precautionary motives and a lack of investment opportunities, at least in the current environment of weak demand for loans, they suggest that the more restrictive policies of Austrian banks probably did not constitute a binding constraint for financing the Austrian enterprise sector.

Bank lending rates have supported lending to the corporate sector in 2016 so far. Between end-2015 and September 2016, interest rates on new loans to nonfinancial corporations sank by 21 basis points (see middle panel of chart 9). The decrease was more marked for loans with an interest rate fixation period of more than five years (-31 basis points) than for shorter periods. In the first nine months of 2016, the spread between interest rates on loans of lesser amounts and larger loans, which – given the lack of other data – is commonly used as an indicator of the relative cost of financing for SMEs, averaged 38 basis points, one of

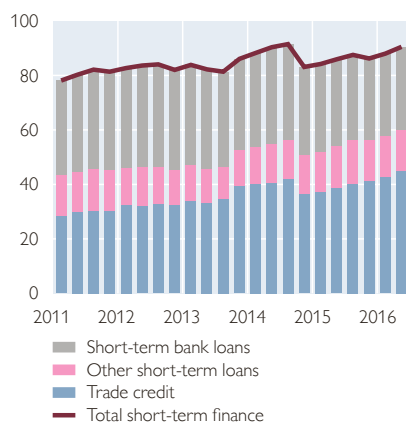
Further decline in interest rates for bank loans

Chart 10

Indicators of corporate liquidity

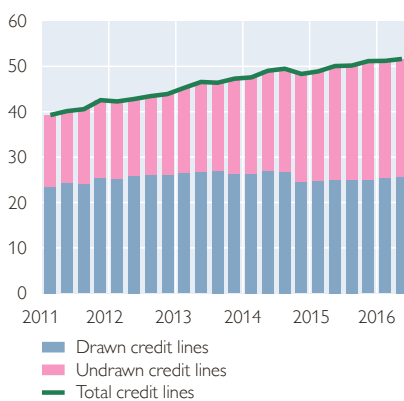
Short-term finance

EUR billion



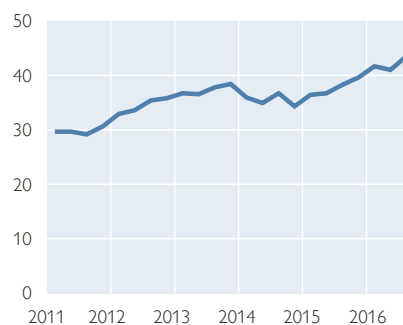
Credit lines

EUR billion



Overnight deposits

EUR billion



Source: ECB, OeNB.

the lowest levels recorded in the euro area.

Debt securities issuance increased slightly, most likely supported by low corporate bond yields. According to financial accounts data, corporate bond issuance amounted to EUR 0.4 billion in the first half of 2016, which accounted for more than 10% of total debt financing, after having dropped by EUR 1.6 billion in the first half of the preceding year.

Interest rate risk of the corporate sector remains elevated

Although the growth of corporate debt (measured in terms of total loans raised and bonds issued) rebounded slightly in the first half of 2016, running to 2.0% year on year in the second quarter, it remained below the nominal expansion rate of gross operating surplus. As a result, the debt-to-income ratio of the corporate sector decreased slightly, by about 2 percentage points, to 411% in by the second quarter of 2016 (see upper left-hand panel of chart 11). However, the debt-to-income ratio remained considerably above pre-crisis levels, implying that the increase in the corporate sector's vulnerability from 2007 to 2009 has not yet been reversed. Moreover, whereas the debt-to-income ratio is lower in Austria than in the euro area as a whole, the debt-to-equity ratio, which remained stable at 93.8% in the first half of 2016, is higher in Austria than in the euro area, reflecting the importance of debt financing in Austria.

The low interest rate environment continued to support firms' current debt-servicing capacity. In the first half of 2016, the proportion of gross operating surplus spent on interest payments for (domestic) bank loans continued to decline slightly, reaching 3.6% in the

second quarter of 2016. This reflected the still very high share of variable rate loans in new loans, which has come down only 5 percentage points to 89% over the past two years. While Austrian companies are therefore currently experiencing lower interest expenses than their euro area peers, they face a higher exposure to interest rate risk. A rebound of interest rates could become a burden, especially for highly indebted companies, even if rising debt-servicing costs may eventually be accompanied by increasing corporate earnings in the event of an economic recovery.

The corporate sector's exposure to foreign exchange risk continued to decrease, amounting to 3.4% in the third quarter of 2016. Since the second quarter of 2014, the share of outstanding foreign currency loans in Austria has been below the figure for the euro area as a whole.

Risk aspects of bonds compare favorably with those of bank loans. Both the share of floating rate issues, amounting to 14.5% in September 2016, and the foreign currency share, amounting to 2.6% of the outstanding volume of corporate bonds, were considerably below the respective values for bank loans.

Insolvencies are usually a lagging indicator of the business cycle. The insolvency ratio (the number of corporate insolvencies in relation to the number of existing companies), which had been on a downward trend over the past years, stabilized in the course of 2016 (based on a moving four-quarter sum to account for seasonality). This development may be attributed to the moderate increase in debt financing and the low interest rate level, which makes debt servicing easier even for highly indebted companies.

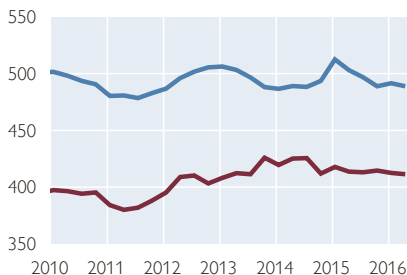
Slight increase in corporate bond issuance

Insolvencies bottom out

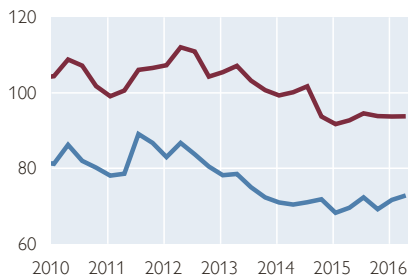
Share of variable rate loans remains high

Risk indicators for nonfinancial corporations**Debt**

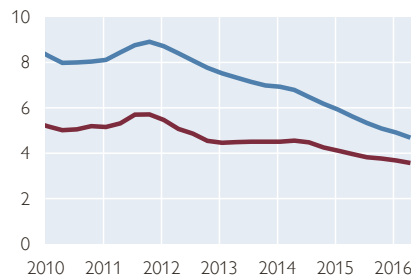
% of gross operating surplus

**Debt-to-equity ratio**

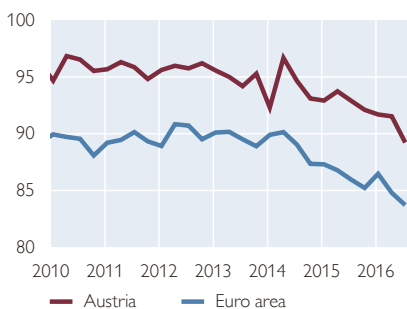
%

**Interest expenses¹**

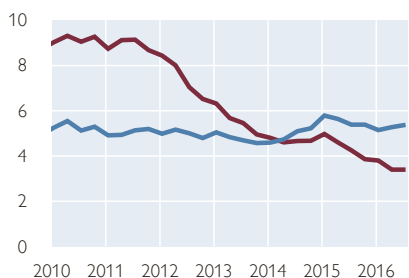
% of gross operating surplus

**Variable rate loans**

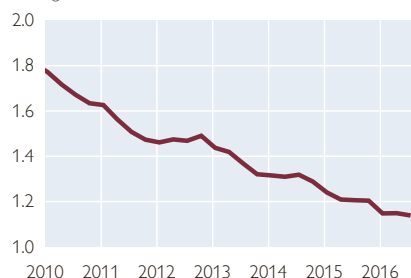
% of total new lending in EUR

**Foreign currency loans**

% of total loans

**Insolvencies**

Number of insolvencies in % of companies, four-quarter moving sum



Source: OeNB, ECB, Eurostat, KSV 1870.

¹ Euro area: euro loans only.**Household indebtedness remains comparatively low****Austrian households' savings rate increases in 2016****Tax reform boosts disposable household income**

Real disposable household income developed unfavorably in the past years. After two years with negative growth rates, real disposable household income expanded only moderately in 2015 (+0.3%). This acceleration was mainly driven by a decline in inflation, while the growth of nominal household income decelerated. In the first half of 2016, the tax reform contributed to faster nominal income growth. The 9.1% drop in direct taxes from households in the first half of 2016 contributed 0.3 percentage points to the 3.3% increase in nominal household income. A look at the components of disposable

income reveals that while the rise in the compensation of employees remained stable at 3.1%, the growth of net mixed income accelerated to 7.6%, whereas property income contracted by 1.0%.

The savings rate of the household sector was on a downward trend until 2014, when it bottomed out at 6.7%. In 2015, the savings rate increased to 7.1%. This increase was driven by the 0.3% growth of real disposable household income in conjunction with stagnating real private consumption. In the first half of 2016, the savings rate stood at 6.9%, representing an increase of 1 percentage point since the first half of 2015 and implying that households have saved part of the additional household income attributable to the tax reform.

Strong preference for liquid assets

Financial investments by households remained quite moderate in the first half of 2016 (see upper left-hand panel of chart 12). Whereas at EUR 4.6 billion, they reached more than twice the exceptionally low level of the first six months of 2015, they still amounted to less than half of the values seen before the onset of the crisis.

In the low nominal interest rate environment, households continued to display a strong preference for highly liquid assets and shifted almost EUR 6 billion into cash holdings and overnight deposits with domestic banks. This was more than total financial investments in the first half of 2016. In contrast, bank deposits with agreed maturity continued to decline, dropping by EUR 2 billion. Between end-2009 and mid-2016, households' overnight deposits increased by EUR 50 billion, while deposits with agreed maturity fell by EUR 25 billion. As a result, the share of overnight deposits in total financial assets has risen from 12.2% to 18.3% since 2009 while the share of deposits with agreed maturity has fallen from 28.3% to 19.1%.

Similarly, as households shunned investments with longer interest rate fixation periods, they continued to reduce their direct holdings of long-term debt securities, cutting them by EUR 1.4 billion in the first half of 2016. Since 2013, the portfolio of securities has been reduced by EUR 10.5 billion. Net investment in mutual funds halved to EUR 1.2 billion in the first half of 2016 (in roughly equal measure in domestic and foreign funds). At the same time, households invested EUR 0.6 billion in quoted stocks. In total, households' net financial investment in capital market instruments turned positive in the first six months of 2016, amounting to EUR

0.5 billion and thus contributing 11% to total financial investments. As a result of falling stock prices (especially in the first quarter of this year), the Austrian household sector, on aggregate, recorded unrealized valuation losses of EUR 1.3 billion on its securities portfolios in the first half of 2016. Quoted stocks accounted for the lion's share, with (unrealized) valuation losses amounting to 5.5% of year-end holdings of quoted stocks; in the case of mutual fund shares, the losses were 0.8% of the household portfolio. However, taking a longer view, (equally unrealized) valuation gains had contributed almost half of the overall increase of households' securities portfolio since 2010 (lower right-hand panel of chart 12). Looking at outstanding amounts, capital market investments accounted for 17.5% of total financial investments at mid-2016, half a percentage point down on the equivalent mid-2015 figure. Thus, there are few indications that households made up for low interest rates by investing in riskier assets.

Investment in life insurance and pension entitlements was again muted in the first half of 2016, amounting to EUR 0.3 billion. Based on outstanding amounts, the share of these investments contracted to 20.3% of total financial assets. This decrease was driven mainly by life insurance policies, where net investments were negative in the first two quarters of 2016, amounting to –EUR 0.4 billion. The reduction is all the more remarkable as a large proportion of gross inflows into these instruments were not an outcome of current investment decisions, but rather reflected past decisions – given the long maturities and commitment periods involved. Moreover, life insurance policies often serve as repayment vehicles for foreign currency bullet loans (even if these are converted into euro loans).

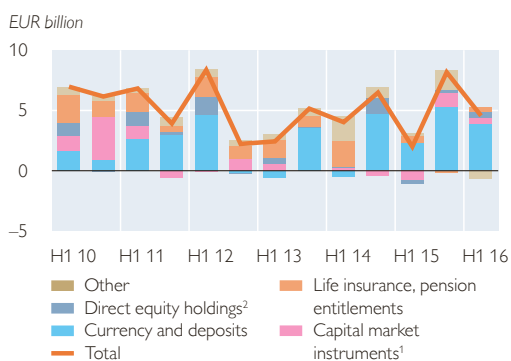
Slight rebound of financial investment

Net investments in life insurance policies negative in 2015

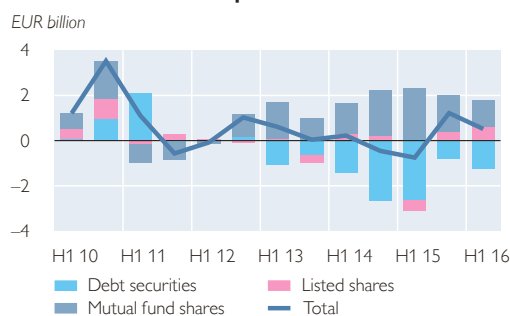
Net investment in mutual funds halved

Financial investments of households

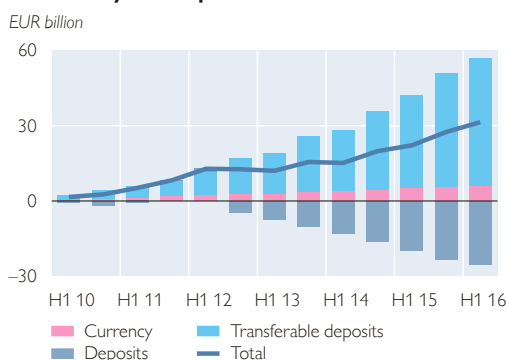
Structure of net financial investments



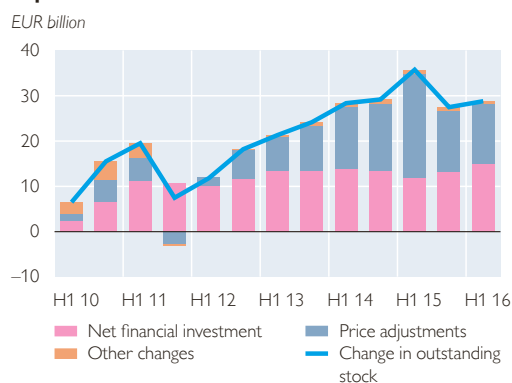
Net investments in capital market instruments



Cumulated net investment in currency and deposits



Cumulated change in stock of capital market instruments



Source: OeNB.

¹ Debt securities, mutual fund shares and listed shares.

² Unlisted shares and other equity.

By contrast, investments in pension entitlements (including both claims on pension funds and direct pension benefits granted by private employers) continued to expand, surpassing the equivalent figure of the first half of 2015 by 11%.

Residential property prices in Austria accelerate in the first half of 2016

Austrian residential property prices accelerated in the first half of 2016. In the second quarter, prices surged by 9.5% year on year in Austria. Prices increased especially in Austria excluding Vienna, augmenting by 12.8% in

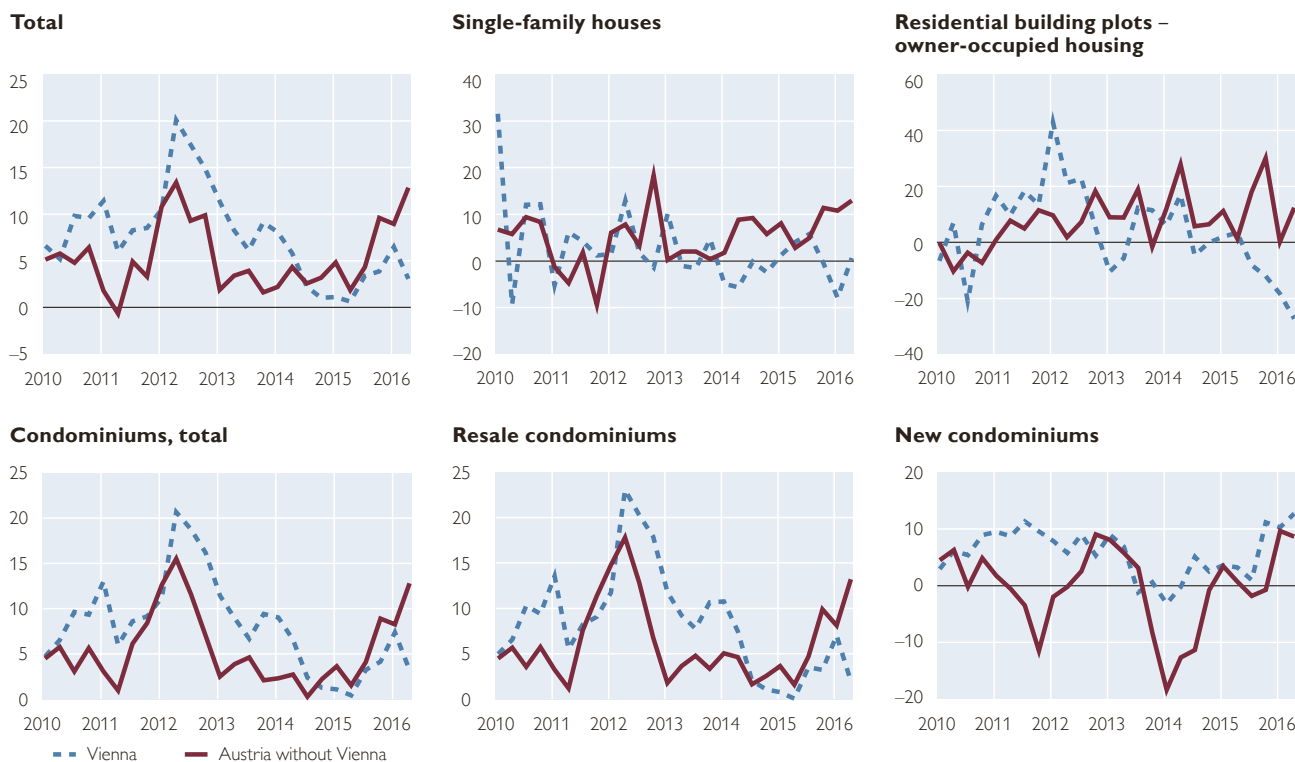
the second quarter of 2016. This gain is the second-highest since property price data became available in 2000 (in the second quarter of 2012, prices increased by 13.4%). By contrast, the rate of price increase subsided in Vienna, with prices advancing by 3.1% year on year (first quarter: +6.5%). Prices in the second quarter in fact went down by 2.4% on the first quarter.

Heterogeneous price developments are currently observable in Vienna. The rise in the price of resale condominiums – the key market segment in Vienna in terms of volume – weakened in the second quarter of 2016, declining to +2.0% on the previous

Property price growth accelerates in Austria excluding Vienna, loses pace in Vienna

Residential property prices by market segments

Annual change in %



Source: Vienna University of Technology, OeNB.

year. By contrast, the price growth of new condominiums continued to speed up, reaching the highest rate in ten years at +12.7%. Single-family house prices stagnated on the previous year (+0.6%). The prices of residential building plots, which, however, are not included in the overall index, declined significantly (–27.3%) over the previous year. However, it has to be taken into account that building plot price developments are based on a very small sample.

In Austria excluding Vienna, the surge in prices was observable in all market segments. The prices of single-family houses – a segment that is far more important in rural areas than in Vienna – mounted by 13.0%. Condominium prices went up by 12.8%. A

breakdown shows that prices of both new condominiums (+8.6%) and the significantly larger share of resale condominiums (+13.2%) soared.

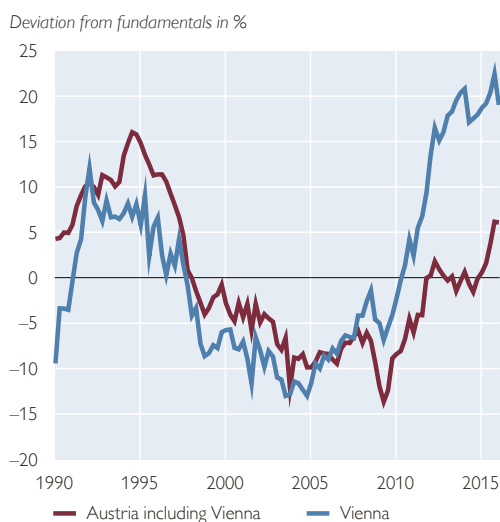
OeNB fundamentals indicator for residential property prices in Austria unchanged

For Austria as a whole, the OeNB fundamentals indicator for residential property prices ended the second quarter at 6.1%, nearly unchanged from the first quarter (6.2%). This signals that residential property prices in Austria are broadly in line with underlying fundamentals. However, a continued increase in the indicator could be considered a warning sign of a potential overheating of the Austrian residential property market.

Austria excluding Vienna: price increases gain strong momentum

Chart 14

OeNB fundamentals indicator for residential property prices



Source: OeNB.

Sharp rise in residential property transactions

The indicator for Vienna dropped by 3.4 percentage points in the second quarter of 2016 to reach 19.0%, which was largely attributable to the 2.4% drop in residential property prices from the first quarter.³

Residential construction gathers pace

Austrian residential construction has picked up noticeably lately. A number of indicators support this observation. Real residential construction investment has displayed a rising trend since the second half of 2014. According to Statistics Austria, the number of building permits for dwelling units in new residential buildings advanced by 21% overall in the first quarter of 2016 and surged by 57% in Vienna. The housing construction output index published by Statistics Austria also showed a strongly rising trend. By increasing housing supply, rising residential construction

investment should help rein in price growth in the future.

The Austrian federal government decided in 2015 to launch a housing stimulus package with the aim of creating 30,000 new apartments between 2016 and 2020. Funding under the housing stimulus package will be managed by a newly established residential construction investment bank, which went into operation in September 2016.

The number of residential property transactions continued to rise in the first half of 2016. Data extracted by IMMOUnited from the land register and published by RE/MAX show that 59,452 residential property transactions with a value of EUR 13.1 billion were handled in this period. Thus, compared to the first half of 2015, the number of transactions increased by 10.1% and their value was lifted by 21.3%. This increase is partly attributable to the tax reform that entered into force in January 2016. The changes introduced by the tax reform on free-of-charge residential property transfers between family members sparked a sharp rise in such transactions. However, the bulk of these transactions were not recorded in the land register until the first quarter of 2016.

Growth in housing loans to households stabilizes

The growth of housing loans to households, which had accelerated in the second half of 2015, has stabilized in recent months. The nominal annual growth rate of loans for home purchase and improvement granted by Austrian banks (adjusted for reclassifications, valuation changes and exchange rate effects) edged up to 5.1% in September 2016. The expansion of housing loans

Rising trend in residential housing investment

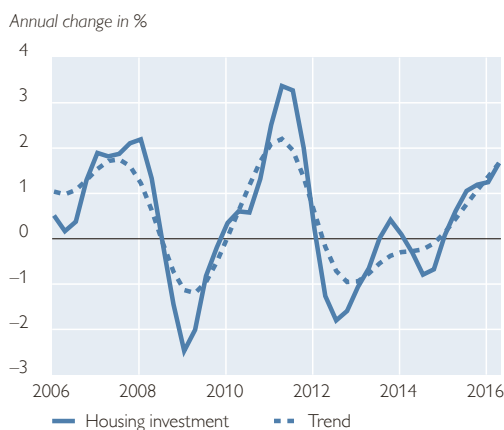
Housing loan growth driven by long-term loans

³ For more analyses and data on the Austrian real estate market, see <https://www.oenb.at/en/Monetary-Policy/real-estate-market-analysis.html>.

Chart 15

Residential construction activity in Austria

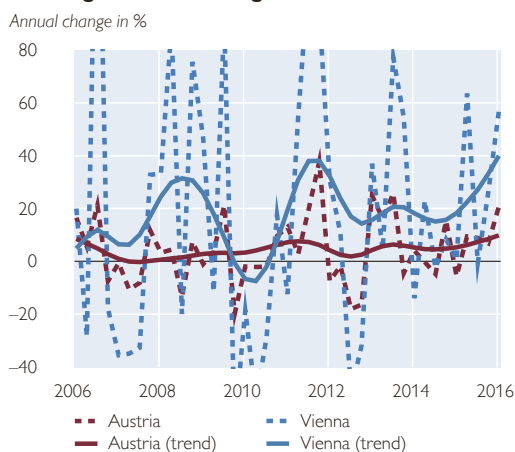
Housing investment¹



Source: WIFO.

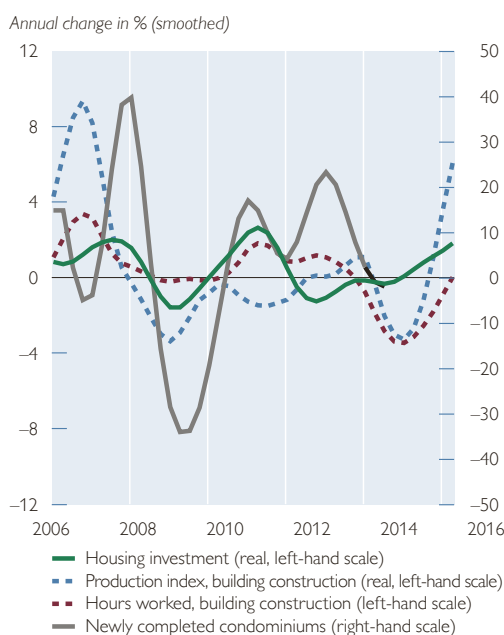
¹ Real prices; seasonally and working-day adjusted.

Building permits – number of dwellings in new buildings



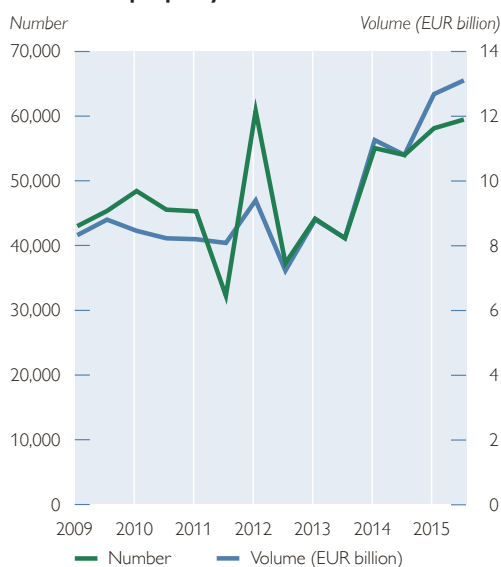
Source: Statistics Austria.

Residential construction in Austria



Source: Statistics Austria, WIFO, authors' calculations.

Residential property transactions in Austria



Source: RE/MAX, IMMOUnited.

was again fueled primarily by long-term loans (maturities of over 5 years), which augmented by 4.8% in the 12 months to September 2016. Whereas housing loans with maturities between 1 year and 5 years mounted even faster (+14.8%), they account for a small volume so that their contribution to overall housing loan growth is low.

Housing loans with the shortest maturity (up to 1 year) in fact contracted.

According to the results of the bank lending survey (BLS), banks' credit standards for housing loans to households were eased marginally in the third quarter of 2016, after they had been tightened somewhat in the second quarter. Overall, bank lending stan-

Financing conditions remain favorable

dards for housing loans have changed little over the past three years.

Credit terms remained favorable. The average interest rates on euro-denominated housing loans to households stood at 1.92% in September 2016, 21 basis points lower than one year earlier. The reduction of interest rates was more pronounced for borrowing with longer periods of interest rate fixation (5 years to 10 years: -0.54% ; over 10 years: -0.50%) than for variable rate loans (with a rate fixation period of up to 1 year), which sank by 14 basis points to 1.87%.

At the same time, the results of the BLS suggest that households' demand for loans edged up in the first two quarters of 2016 (and remained constant in the third). Since the first quarter of 2015 (when this factor was included in the BLS questionnaire), responding banks have attributed the upturn in demand for housing loans largely to the general level of interest rates. Housing market prospects, including expectations of rising house prices, are another factor that has consistently affected the increasing demand for housing.

Although the share of foreign currency loans in outstanding housing loans has contracted further in recent months, the remaining stock of such loans still carries a high exchange rate risk. In September 2016, the foreign currency loan share came to 18.0%. At the same time, the interest rate risk of new housing loans lessened.

Households' currency and interest rate risks

At mid-2016, the household sector's total liabilities amounted to EUR 176.4 billion according to financial accounts

data, up by 3.3% in nominal terms on the previous year's figure. More than 85% of the financial liabilities of Austria's households consist of loans from (domestic) banks. In September 2016, bank loans to households increased by 3.2% year on year in nominal terms (adjusted for reclassifications, valuation changes and exchange rate effects). While housing loans, which are the most important loan category for households, accounting for almost two-thirds of all their outstanding bank loans, continued to grow quite briskly, consumer loans shrank by 2.2% year on year and other loans, which had fallen for more than four years, grew by 0.9% year on year.

As loans expanded at a slower pace than household disposable income, household debt fell slightly, expressed as a percentage of net disposable income, by 0.8 percentage points to 90.5% during the first half of 2016 (see upper left-hand panel of chart 16). The reduction of the ratio of housing loans to disposable income by one-quarter of a percentage point to 63.9% at mid-2016 was less pronounced.

As a result, the debt ratio of households in Austria remained lower than that of households in the euro area as a whole. Moreover, it should be taken into account that, according to data from the Household Finance and Consumption Survey (HFCS), only about one-third (34%) of Austrian households have an outstanding loan. Thus, it is not the absolute level of Austrian households' indebtedness that is a potential concern, but rather the high shares of variable rate and foreign currency loans.

Share of foreign currency and variable rate loans in housing loans declines

Household indebtedness low despite slight increase

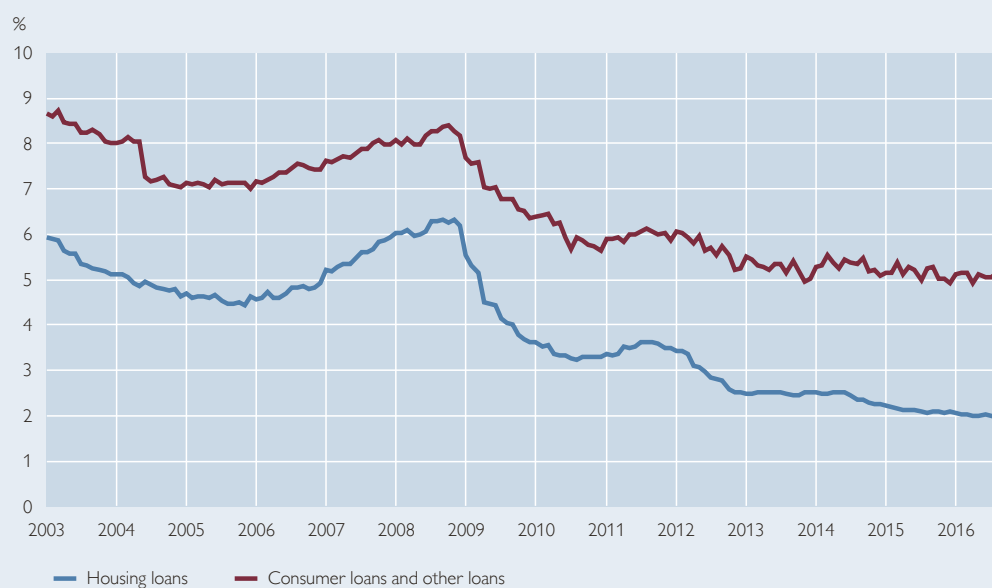
Box 1

The risk-bearing capacity of households with adjustable rate mortgages

Interest rates for loans to households have been on a steady decline in Austria in recent years (see chart 1). Loan interest rates started to fall after having peaked at the end of 2008, at 6.3% (housing loans) and at 8.4% (consumer loans), dropping to 1.9% (housing loans) and to 4.9% (consumer loans) in September 2016, which corresponds to a decline of 4.4 or 3.5 percentage points. This decline has benefited numerous domestic borrowers, because most borrowers have opted for adjustable rates. According to OeNB interest rate statistics, more than 60% of all new housing loans had an agreed maturity of up to 1 year at the end of the second quarter of 2016. While this share is somewhat smaller than the corresponding figure for total lending, it is significantly higher than the euro area equivalent, which stands at about one-quarter of total lending. In other words, while the decline in interest rates has brought down interest rate expenditure for households, a renewed increase of interest rates would instantly drive such expenditure back up again.

Chart 1

Interest rates for loans to households in Austria



Source: OeNB.

Note: Interest rates for loans to households with an agreed maturity of up to 1 year (outstanding amounts).

Risk indicators based on macro data fail to adequately reflect the risks to financial stability that may arise from the household sector. Data that have become newly available from the second wave of the Household Finance and Consumption Survey (HFCS) for Austria for 2014 show that adjustable rate mortgages are unequally distributed across households (see table 1):

- The share of households holding adjustable rate mortgages is higher among households whose reference person has an academic degree than among households whose reference person has a lower educational level.
- Up to the age of 64 years, the incidence of adjustable rate mortgages is negatively correlated with the age of the household's reference person.
- The share of households holding adjustable rate mortgages is disproportionately high in the top gross income quartile of households. This segment accounts for about two-thirds of the entire volume of outstanding adjustable rate mortgages.

- The outstanding amount of adjustable rate mortgages (with a mean of EUR 93,130 and a median of EUR 66,930) is higher than the outstanding amount of fixed rate mortgages (with a mean of EUR 73,457 and a median of EUR 40,166; not shown in the table).

Table 1

Households with adjustable rate mortgages

	2010			2014				
	Share of households with at least one adjustable rate mortgage (in %)	Outstanding amount of adjustable rate mortgages (in EUR) ¹		Distribution of adjustable rate mortgage debt (in %)	Share of households with at least one adjustable rate mortgage (in %)	Outstanding amount of adjustable rate mortgages (in EUR) ¹		Distribution of adjustable rate mortgage debt (in %)
		Mean	Median			Mean	Median	
All households with mortgages	70	80,910	43,089	100	53	93,130	66,930	100
Risk aversion (reference person)								
Yes	68	74,000	40,370	69	54	89,614	64,755	79
No	77	103,157	58,326	31	49	109,808	87,564	21
Highest education qualification (reference person)								
Compulsory education (not) completed	59	59,823	29,349	8	53	85,832	75,938	10
Apprenticeship or vocational school	70	74,820	34,995	50	53	75,080	53,243	38
High-school degree	72	105,400	82,737	18	49	106,959	85,465	24
Academic or technical college degree	76	91,713	58,200	24	58	123,160	96,386	28
Age (reference person)								
16–34	65	99,003	54,821	18	57	137,974	107,704	24
35–44	69	102,948	79,053	41	55	93,291	78,464	29
45–54	80	80,433	35,537	28	56	107,361	80,866	36
55–64	69	46,174	17,872	9	44	52,793	28,620	8
65+	60	34,402	26,249	4	50	29,492	19,200	3
Gross income quartiles								
1	40	92,608	37,341	4	.	.	.	.
2	64	48,328	28,404	10	45	62,929	49,579	9
3	73	76,694	40,314	28	45	90,051	83,808	22
4	75	94,344	54,013	58	59	109,291	81,981	65
Gross wealth quartiles								
1	.	.	.	.	.	.	.	.
2	54	24,951	6,720	1	.	.	.	.
3	64	68,162	39,437	33	53	72,733	59,529	35
4	77	93,362	51,086	66	53	114,282	86,012	63

Source: HFCS Austria 2010 and 2014, OeNB.

¹ Means and medians were calculated for all households that have taken out at least one adjustable mortgage.

Note: If for any household group there were fewer than 30 observations in any multiple imputation impute, the corresponding estimates were set to "."

Compared with the HFCS 2010 data, the share of households holding adjustable rate mortgages has gone down, from 70% to 53%. At the same time, the distribution of adjustable rate mortgage debt has remained broadly stable across household groups between the two survey waves, with the notable exception of the fact that borrowing has become more concentrated in the top income quartile. As a result, the risk resulting from fast interest rate increases is likely to be

concentrated in this segment, which a priori should also come with a higher risk-bearing capacity, though. However, to arrive at a more comprehensive view of the risk-bearing capacity of individual households, it is important to also factor in other aspects, such as expenses, debt or assets.

What follows are the (aggregated and disaggregated) results from stress tests which show how the risk-bearing capacity of Austrian households responds to interest rate increases. The results are based on data from the second (2014) wave of the HFCS for Austria. The simulated scenarios of the model discussed in Albacete et al. (2014)¹ have been updated in line with the latest interest rate developments.

Apart from the baseline scenario (no change of interest rates), we have simulated the following scenarios:

- Scenario 1: Interest rates for mortgages and uncollateralized loans increase by 1.4 percentage points (which corresponds to the decrease in (weighted) interest rates for housing and consumer loans between the peak in August 2011 and September 2016).
- Scenario 2: Interest rates for mortgages and uncollateralized loans increase by 2.9 percentage points (which corresponds to the decrease in (weighted) interest rates for housing and consumer loans between the average for the 2003–08 period and September 2016).
- Scenario 3: Interest rates for mortgages and uncollateralized loans increase by 3.9 percentage points (which corresponds to the decrease in (weighted) interest rates for housing and consumer loans between the highest measure in the time series (i.e. since 2003) and September 2016).²

The results from the stress tests are evident from table 2. They relate to three common risk indicators. The first indicator shows how the share of borrowers with a negative financial margin changes under the impact of the different stress scenarios. The financial margin of a household is defined as the household income minus basic living costs minus debt servicing costs. A negative margin implies that the household may find it difficult to repay outstanding debt. The larger the increase in interest rates, the higher the probability that a household may encounter repayment difficulties. As illustrated in table 2, 3.1% of households have a negative financial margin in the baseline scenario. In scenario 1 (interest rates increase by 1.4 percentage points), the share of vulnerable households climbs by 0.7 percentage points, to 3.8%. This compares with an increase by 1.6 percentage points to 4.7% in scenario 3 (interest rates increase by 3.9 percentage points).

Table 2

Stress test results

	Baseline	Interest rate increase by ...		
		1.4 percentage points	2.9 percentage points	3.9 percentage points
Households with a negative financial margin (in % of borrowers)	3.1	3.8	4.4	4.7
Debt held by such households (in % of total household debt)	7.0	9.0	10.2	10.4
Debt held by such households that cannot be offset by their total assets (in % of total household debt)	0.3	0.3	0.5	0.5
Debt held by such households that cannot be offset by their real assets (in % of total household debt)	0.4	0.4	0.6	0.6

Source: HFCS Austria 2014, OeNB and author's calculations.

¹ Albacete, N., J. Eidenberger, G. Krenn, P. Lindner and M. Sigmund (2014). Risk-Bearing Capacity of Households – Linking Micro-Level Data to the Macroprudential Toolkit. OeNB Financial Stability Report 27. 95–110.

² Scenario 3 reflects current supervisory policy, which requires banks to inform potential borrowers of adjustable rate loans with a leaflet indicating, among other things, how repayment may be affected by interest rate changes. Specifically, the leaflet must show the maximum repayment amount based on the “highest borrowing rate of the past 20 years.”

In order to be able to assess underlying risks to financial stability, the amount of household assets and the level of outstanding debt need to be taken into consideration as well. These aspects are captured by the other two risk indicators shown in table 2. By taking into account only the level of outstanding debt in a first step, the second risk indicator shows that in scenario 1 the 3.8% share of households with a negative financial margin accounts for 9% of total household debt. When we proceed to offset debt against assets, the third risk indicator shows that the residual risk to financial stability is likely to be rather small: Only 0.3% of total household debt can be traced to debt of vulnerable households whose assets do not suffice to offset it (which is exactly the same percentage as in the baseline scenario). As would be expected, real assets (rather than financial assets) serve to offset the bulk of household debt.

The difference between scenario 3 and the baseline scenario illustrates how these risk indicators would change if interest rates were to rise to the level of the highest weighted interest rate in the time series since 2003 (6.35%, measured in October 2008). In this case, the share of households with a negative financial margin would increase by 1.6 percentage points; their share in total household debt would rise by 3.4 percentage points; and their share of uncovered debt in total household debt would climb by 0.2 percentage points.

These stress test results should be interpreted as upper boundaries for the following reasons: First, the figures relate to households with a negative financial margin, rather than to private bankruptcy cases. Households with negative financial margins can be expected to have a few options left before filing for private bankruptcy, such as seeking debt restructuring, seeking help from family and friends, etc. Second, the amount of outstanding debt, as defined for the second and the third risk indicator, relates to the entire debt (mortgage and nonmortgage) of households with a negative financial margin; it is not limited to mortgages with adjustable rates. The analysis at hand is based on the assumption that households with two or more outstanding loans or with other types of debt will not be able to repay any one of their loans or any of the other debt types, not even in part. Finally, readers must bear in mind that the simulated losses estimated for banks and households refer to unrealized losses. These losses would only be realized if they were to fall due as soon as a given scenario materializes. In actual fact, loans come with comparatively long maturities.

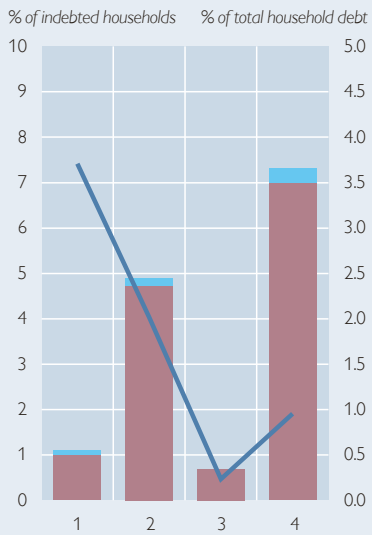
A disaggregated look at the stress test results shows that the simulated increase in interest rates affects above all households whose debt is largely offset by their assets. This finding, which becomes evident from chart 2, is consistent with the results in table 1, according to which higher-income households tend to hold a larger share of the adjustable rate mortgage debt. While the incidence of households with a negative financial margin is disproportionately high in the lower-income segments, such households at the same time account for a smaller share in total household debt. Of the 7% of total household debt held by households with a negative margin in the baseline scenario (see table 2), the two lower-income segments account for 3 percentage points, and the two upper-income segments account for 4 percentage points (see chart 2). The simulated scenarios 1 to 3 show that an increase in interest rates will affect the debt of the lower-income segments as much as those of the upper-income segments. For instance, we find a rise in interest rates of 3.9 percentage points (scenario 3) would drive up the share of debt held by vulnerable households by 1.7 percentage points both in the two lower-income segments (from 3% to 4.7%) and in the two upper-income groups (from 4% to 5.7%). At the same time, the amount of debt held by vulnerable households that is not offset by their total assets is low across all income groups and in all scenarios.

While the risk to financial stability that may arise from interest rate increases is interpreted to be low, the debt burden may nonetheless be huge for individual households. Many of them would have to use a major share of their financial and/or real assets to be able to pay back their debt. Moreover, the debt burden would be even higher if interest rate increases were to coincide with other shocks, such as income losses or an appreciation of foreign currencies, such as the Swiss franc.

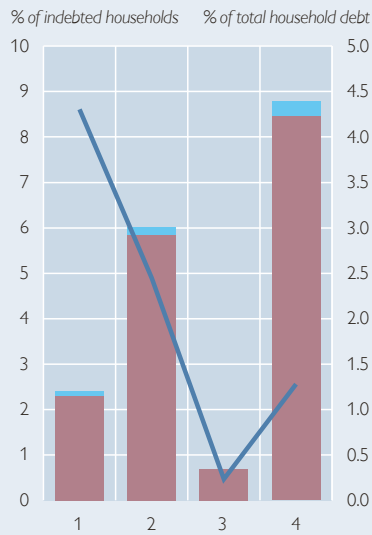
Chart 2

OeNB household stress test: increase in interest rates (by income segments)

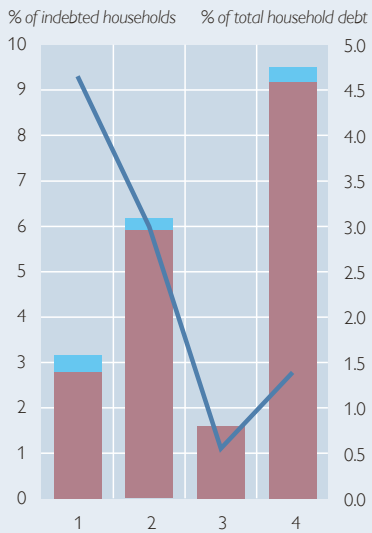
Baseline scenario



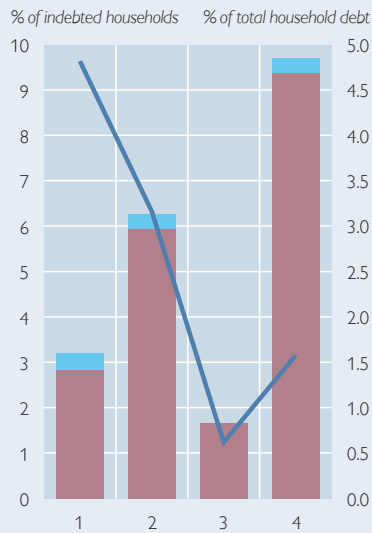
Scenario 1: increase by 1.4 percentage points



Scenario 2: increase by 2.9 percentage points



Scenario 3: increase by 3.9 percentage points



■ Debt held by households with a negative financial margin, not offset by assets (right-hand scale)
■ Debt held by households with a negative financial margin, as offset by assets (right-hand scale)
— Households with a negative financial margin (left-hand scale)

Source: HFCS Austria 2014, OeNB and author's calculations.

Share of variable rate loans comes down gradually

Foreign currency loans remain a concern

In the second quarter of 2016, loans with an initial rate fixation period of up to one year accounted for 71% of new lending (in euro) to households compared to 75% in the same period of the previous year. The share of variable rate loans in new housing narrowed to 64%, down from 71% 12 months earlier. But despite this recent decline, the share of variable rate loans is still very high by international comparison. On the one hand, this entails lower current interest expenses. In the second quarter of 2016, households' interest expenses equaled 1.7% of aggregate disposable income, about 2 percentage points less than in 2008, the year before interest

rates had begun to fall. Lower current interest expenses result from the faster pass-through of the ECB's lower key interest rates to lending rates in Austria than to those in the euro area as a whole. In view of the comparatively low level of indebtedness of Austrian households, loan quality may also have played a role. On the other hand, however, the high share of variable rate loans in total lending over the medium term implies considerable interest rate risks in the household sector.

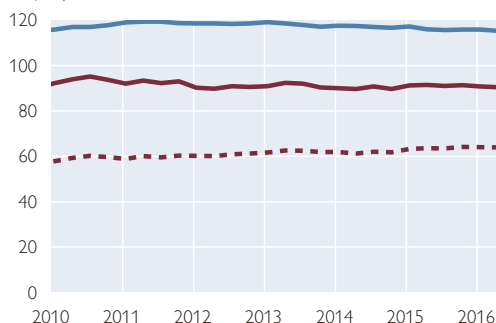
Likewise, the still very high share of foreign currency loans in the total stock of lending remains a major risk⁴ factor for households, despite a notice-

Chart 16

Indicators of household indebtedness

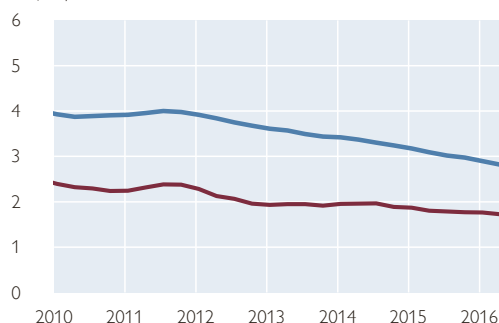
Liabilities

% of disposable income



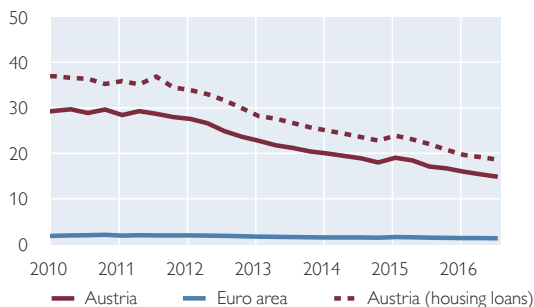
Interest expenses

% of disposable income



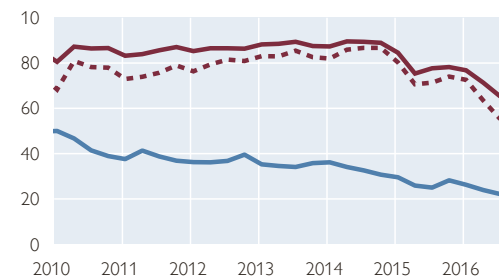
Foreign currency loans

% of total loans



Variable rate loans

% of total loans



Source: OeNB, Statistics Austria, ECB, Eurostat.

Note: Figures for the euro area represent only interest rate expenses on euro-denominated loans.

⁴ This risk had been highlighted in January 2015 when, as a result of the strong appreciation of the Swiss franc following the decision of the Swiss National Bank to discontinue the minimum exchange rate of CHF 1.20 per euro, the foreign currency share rose from 18.0% to 19.5% within one month.

able decrease in past years. In September 2016, the share of foreign currency loans fell to 14.8%, about half the maximum value reached about ten years ago. The foreign currency share varies considerably depending on loan pur-

pose: For housing loans, it was 18.0%, for consumer loans 5.0% and for other loans 11.0%. Almost all outstanding foreign currency-denominated loans are denominated in Swiss francs (close to 97%).

Box 2

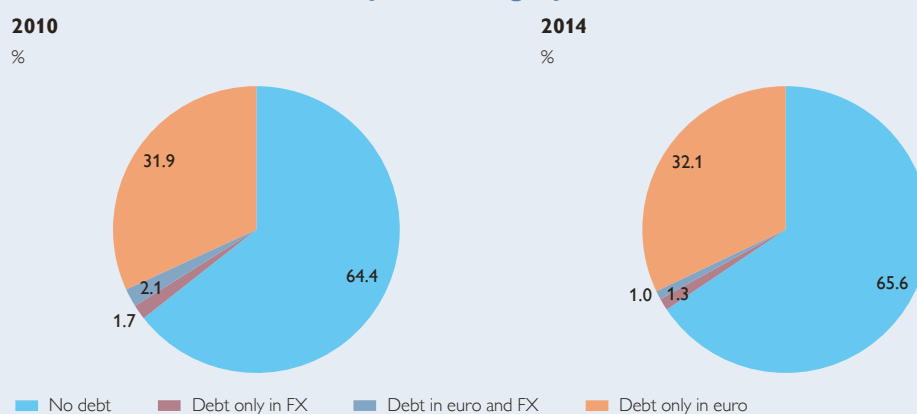
Foreign currency borrowers in Austria – evidence from the new wave of the Household Finance and Consumption Survey

In recent years, the allocation of new foreign currency (FX) loans to the household sector has been reduced considerably to about 1% of total new lending in mid-2016. However, the household sector's stock of FX loans remains relatively large, accounting for about 15.4% of all household debt in mid-2016. The fact that most loans are fully outstanding until the repayment deadline, which in most cases has yet to come, is crucial in understanding why the stock of FX loans is as large as it is. Also, valuation effects have played an important role for maintaining the large size of the stock of FX loans. In particular, as more than 90% of all FX loans to Austrian households are denominated in Swiss francs, the appreciation of the Swiss currency against the euro over recent years has directly increased the outstanding amount of such loans.

As FX borrowing is highly relevant for financial stability in Austria, we have analyzed the latest developments and present some descriptive statistics based on data of the Eurosystem Household Finance and Consumption Survey (HFCS) in this box. Chart 1 below shows that approximately 2.3% of Austrian households (90,000 households) have FX loans. About half of these households also hold debt in euro. Households with euro-only debt are a larger group, accounting for 32.1% of Austrian households. The remaining 65.6% of households do not have any debt.

Chart 1

Distribution of households by debt category



Source: HFCS Austria 2010 and 2014, OeNB.

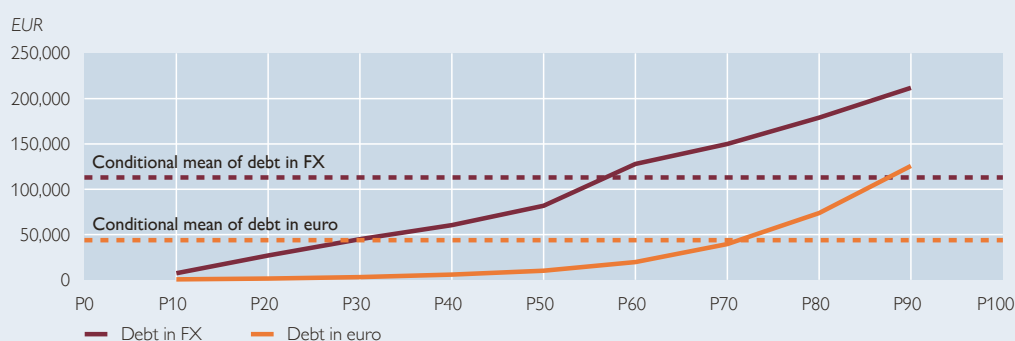
While the proportion of households with euro-only debt remained largely stable between 2010 and 2014, the proportion of FX borrowers in 2014 was significantly lower than in 2010. The share of households without debt increased slightly between 2010 and 2014.

Chart 2 shows the distribution of FX debt across Austrian households represented by its quantile function. One-tenth of Austrian FX-borrowing households have FX debt of less than EUR 7,000, and one-half have FX debt of less than some EUR 82,000. By contrast, about one-fifth of households with FX debt have FX debt of more than EUR 180,000, and one-tenth have FX debt of more than some EUR 212,000. The mean is around EUR 113,000 and

hence is in the sixth decile. This implies that approximately three-fifths of households have less FX debt than the average. The finding illustrates the slightly positively skewed distribution of FX debt. All FX debt values are relatively high compared with euro debt values, as illustrated by the fact that all percentiles of FX debt are above the respective figures of euro-denominated debt. The large FX debt values are due, on the one hand, to the bullet loan structure of most FX loans and, on the other hand, to the fact that FX loans are almost exclusively mortgage loans whereas very often euro loans are nonmortgage loans. Overall, around 17% of households hold mortgage loans; 21% hold nonmortgage loans. The aggregate share of mortgage loans accounts for more than 85% of total household liabilities.

Chart 2

Households with FX debt vs. euro-denominated debt: percentiles and mean



Source: HFCS Austria 2014, OeNB.

Looking at the coverage of FX debt by assets at the household level helps us understand the potential risk associated with the outstanding FX debt (see table below). Almost 45% of the FX debt is covered by financial assets. If real estate and other tangible assets are deducted, only 0.2% of all Austrian borrowers have FX debt that is not covered by some assets. This debt makes up 2.6% of total FX debt and 0.4% of total debt. This means that financial stability risks stemming from households defaulting on their FX debt are rather limited. What is more, most likely only a small share of these households would be vulnerable under adverse economic developments.

Table

FX debt covered by assets

	Share in total FX debt	Share in total debt
	%	
FX debt	100.0	15.4
FX debt minus current accounts	97.9	15.0
FX debt minus current and savings accounts	68.4	10.5
FX debt minus financial wealth	55.6	8.6
FX debt minus financial wealth and other real estate	46.6	7.2
FX debt minus financial wealth, other real estate and main residence	3.0	0.5
FX debt minus all wealth	2.6	0.4

Source: HFCS Austria 2014, OeNB.

However, while the risk to financial stability from household FX debt is low given the level of household wealth, FX debt can be a substantial burden for vulnerable households. Furthermore, small groups of highly FX-indebted households can still create problems, if this debt is concentrated in certain banks or regions. A further qualification to this analysis is that it is based on current wealth and debt figures, which may change with economic conditions, especially in the case of FX loans (due to the risks associated with changes in exchange rates, interest rates or asset prices; such changes could sharply reduce the value of the repayment vehicle).

Box 3

Real estate price changes and household vulnerability – microdata evidence in Austria

The evaluation of household vulnerability in conjunction with house price changes is a core topic of financial stability analyses. For this reason, an extensive analysis of the house price distribution, as well as its change over time and in connection with the finances and liabilities of households in Austria, was published in Financial Stability Report 31 (Albacete et al., 2016). This box returns to the subject and sheds some light on the development over recent years in Austria. Additionally, the results are compared with available information on the euro area.¹

We need to inspect information about household real estate holdings before evaluating related financial stability risk from households. Table 1 reports participation rates as well as median and mean levels of real assets, with an emphasis on the subcomponents household main residence and other real estate as well as mortgage loans (separated into mortgages for households' main residences and for other real estate) for Austria for the years 2010 and 2014 and for the euro area² for 2010.

Table 1

Real estate and mortgage loans: Austria vs. the euro area

	2010						2014		
	Austria			Euro area			Austria		
	Owner-ship rates	Median	Mean	Owner-ship rates	Median	Mean	Owner-ship rates	Median	Mean
	%	EUR 1,000		%	EUR 1,000	%	EUR 1,000		
Real Assets	84.8	107	277	91.1	145	235	84.5	140	281
HMR	47.7	200	258	60.1	180	217	47.7	250	289
ORE	13.4	94	228	23.8	103	211	12.1	124	330
Mortgage loans	18.4	38	76	23.1	68	95	16.7	60	89
Mortgages for the HMR	16.6	37	73	19.4	65	87	15.5	60	89
Mortgages for ORE	2.4	36	80	5.5	57	95	1.5	53	76

Source: HFCS 2010 and 2014, OeNB and ECB.

Note: HMR = household's main residence; ORE = other real estate. The first wave of the HFCS 2010 covered those countries that were members of the euro area at the time, excluding Ireland, Estonia and Latvia. The estimates of mean and median are all rounded to the nearest thousand.

Slightly fewer than half of households in Austria own their main residence. The ownership rate in Austria in 2010 was 47.7% compared to 60.1% in the euro area. As the ownership rate stayed constant from 2010 to 2014, the group of households that newly bought real estate in Austria should also be small.

The HFCS data also reflect the recent house price inflation in Austria, as the median wealth held in the form of a household's main residence increased from EUR 200,000 to EUR 250,000 between 2010 and 2014. By comparison to the euro area, the wealth held in Austria in the form of households' main residences is relatively large, conditional on the household owning its main residence.

Looking at the liability side, the share of mortgage holders is smaller in Austria (18.4%) than in the euro area (23.1%), and both the mean and median levels of outstanding mortgages were lower in Austria than in the euro area in 2010. Furthermore, while the share of households with a mortgage decreased from 18.4% to 16.7%, the size of mortgages in terms of both mean and median increased substantially in Austria between 2010 and 2014 (the median from EUR 38,000 to EUR 60,000; the mean from EUR 73,000 to EUR 89,000).

¹ All the results are based on the first two waves of the Household Finance and Consumption Survey (HFCS) published by the ECB (the interested reader is referred to the documentation of this survey, e.g. Fessler et al., 2016, or ECB, 2013).

² The first wave in the HFCS 2010 contains the euro area countries at the time, excluding Ireland, Estonia and Latvia.

In addition, in Austria, the high share of foreign currency loans (in terms of outstanding stocks from the past, not new loans), which are often bullet loans, has to be kept in mind (see box 2 in this report).

However, as the level of wealth held in real estate also increased between 2010 and 2014, the change in liabilities itself does not provide enough information about household vulnerability. Household vulnerability is discussed in more detail below.

Table 2 shows the importance of real estate wealth for the large majority of households in Austria. To account for the limitations that surveys (without an oversampling scheme) have in recording the tails of the distribution, we restrict the analysis in this part to the middle 90% of households with respect to net wealth.

Table 2

Portfolio allocation for the middle 90% of households in terms of net wealth

%	2010				2014	
	Austria		Euro area		Austria	
	Share in gross wealth	Share in net wealth	Share in gross wealth	Share in net wealth	Share in gross wealth	Share in net wealth
Net wealth	92.4	100.0	87.7	100.0	91.8	100.0
Gross wealth	100.0	108.3	100.0	114.1	100.0	108.9
Real assets	79.3	85.8	83.4	95.1	82.1	89.4
Real estate assets	67.6	73.2	75.6	86.2	73.5	80.1
Financial assets	20.7	22.4	16.6	19.0	17.9	19.5
Total liabilities	7.6	8.3	12.3	14.1	8.2	8.9
Mortgage loans	6.7	7.2	10.5	12.0	7.5	8.1
Nonmortgage loans	1.0	1.1	1.8	2.1	0.7	0.8

Source: HFCS 2010 and 2014, OeNB and ECB.

Note: The first wave of the HFCS 2010 covered those countries that were members of the euro area at the time, excluding Ireland, Estonia and Latvia.

Real assets in general, and real estate (households' main residences and other real estate taken together) in particular, constitute the most important components of households' wealth at the aggregate level. In the euro area, in particular, 75.6% of gross wealth is held in real estate compared to 67.6% in Austria. The share of total liabilities is also smaller in Austria than in the euro area. For instance, the aggregate share of outstanding mortgages in terms of net wealth is 7.2% in Austria compared to 12.0% in the euro area. Reflecting the substantial price increases in the past few years, between 2010 and 2014 both real estate assets and liabilities gained importance in Austrian households' balance sheets.

Turning to households' financial vulnerability, table 3 reports the debt³-to-asset (DTA), debt-to-income (DTI, based on yearly gross income), and debt-service-to-income (DSTI, also based on gross yearly income) ratios for mortgage holders. These indicators are generally thought of as short-term (DSTI), medium-term (DTI) and long-term (DTA) measures of households' debt burden. All indicators focus on the borrower's perspective, as is highlighted in the handbook of the ESRB (ESRB, 2014). Again, the special case of bullet loans has to be kept in mind.

³ For reasons of simplicity and comparability, none of the indicators take the savings for repayment vehicles into account. Debt includes both mortgage and nonmortgage debt of mortgage holders.

Table 3

Household vulnerability for mortgage debt holders

%

	2010				2014	
	Austria		Euro area		Austria	
	Median	Share of vulnerable households	Median	Share of vulnerable households	Median	Share of vulnerable households
Debt-to-asset ratio (DTA)	12.2	3.5	26.8	3.9	18.0	1.6
Debt-to-income ratio (DTI)	76.4	15.4	167.2	26.4	106.7	17.9
Debt service-to-income ratio (DSTI)	4.8	5.4	17.9	14.6	6.9	2.6

Source: HFCS 2010 and 2014, OeNB and ECB.

Note: The first wave of the HFCS 2010 covered those countries that were members of the euro area at the time, excluding Ireland, Estonia and Latvia. As commonly done in the literature, a household is classified as vulnerable with regard to the relevant indicator if DTA>100%, DTI>300% and DSTI>40%.

In 2010, the Austrian median household with mortgage loans had a lower debt burden than the median euro area household. Taking, for example, the DTA indicator, in 2010 at the median, about 12% of gross assets were outstanding in liabilities for mortgage holders. This figure was less than half the comparable figure for the euro area (about 27%). The same holds for the two other indicators of households' debt burden. Furthermore, in Austria, the share of vulnerable households⁴ in 2010 was considerably lower than in the euro area. Taking e.g. the definition of vulnerability of DSTI greater than 40% provides an estimate of 5.4% of vulnerable mortgage holders in Austria compared with 14.6% in the euro area.

While the median of each measure of vulnerability increased between 2010 and 2014 in Austria, the share of vulnerable households is more important with respect to financial stability. In two out of three of the indicators (DTA and DTI), this share decreased by more than 50%. Thus, in 2014, fewer mortgage holders in Austria were potentially vulnerable than in 2010. Only the estimate of the share of vulnerable households based on DSTI increased slightly due to the increase in outstanding liabilities (as was shown in table 1).

While this box cannot cover the full depth of issues related to households' financial vulnerability from house price developments and mortgage loans, it provides additional information compared to the specific study on the topic in the Financial Stability Report 31, because it highlights the comparison with the euro area and the development over time between 2010 and 2014 in Austria. Overall, the conclusions from Albacete et al. (2016) are confirmed and complemented: The vulnerability of households from mortgage loans is considerably lower in Austria than in the euro area. The share of vulnerable households decreased substantially for two out of three indicators between 2010 and 2014. Even adverse scenarios of house price decreases (drawing on results from the Financial Stability Report 31) have only a limited impact on the losses given default of vulnerable households. Hence, judging from HFCS data on real estate and liabilities, Austrian households' financial vulnerability from these assets and liabilities has remained relatively modest so far. In a changing environment, however, the vulnerability of indebted households deserves close attention and constant monitoring.

⁴ The common definitions of vulnerability from the literature, i.e. DTA greater than 100%, DTI greater than 300%, and DSTI greater than 40%, are used for illustrative purposes for these results.

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Austrian financial intermediaries: structural reforms gain momentum in a challenging environment

Operating profitability of Austrian banks under pressure

In 2016, the European financial sector has still faced subdued economic growth and low interest rates. In this challenging environment, legacies of nonperforming loans and increasing pressure on interest margins continue to dampen the profitability outlook. Austrian financial intermediaries are continuing their adaptation process, as structural reforms designed to improve efficiency gain momentum.

In the first six months of 2016, the consolidated net profit of Austrian banks came to EUR 2.9 billion, nearly 10% above the corresponding figure of the previous year. On an annualized basis, this would translate into a return on average assets of 0.6%. However, this improvement was mainly attributable to a significant reduction in credit risk provisioning rather than improvements in operating business.

Owing to the transfer of ownership in UniCredit Bank Austria's CESEE subsidiaries to the Italian UniCredit Group in October 2016, the comparability of most aggregate balance sheet and profit and loss account positions of Austrian banks is limited. Thus, the year-on-year changes mentioned in the following paragraphs are based on figures that have been adjusted for this one-off effect.

Austrian banks' consolidated operating profit decreased by around one-quarter in the first half of 2016, due to weakened operating income and slightly rising operating expenses. As a consequence of the low interest rate environment, net interest income remained under pressure. Fee and commis-

sion income was burdened by sluggish securities business, and other operating income was negative again. On the positive side, trading income increased markedly compared to the previous year.

Operating expenses increased, driven by higher write-downs on non-financial assets and slightly rising administrative expenses, including staff costs (partly attributable to a one-off effect). Moreover, since 2015, banks have had to pay contributions to funds for deposit insurance and bank resolution. A considerable positive impact on banks' profits came from lower credit risk provisioning, which is well below pre-crisis levels.

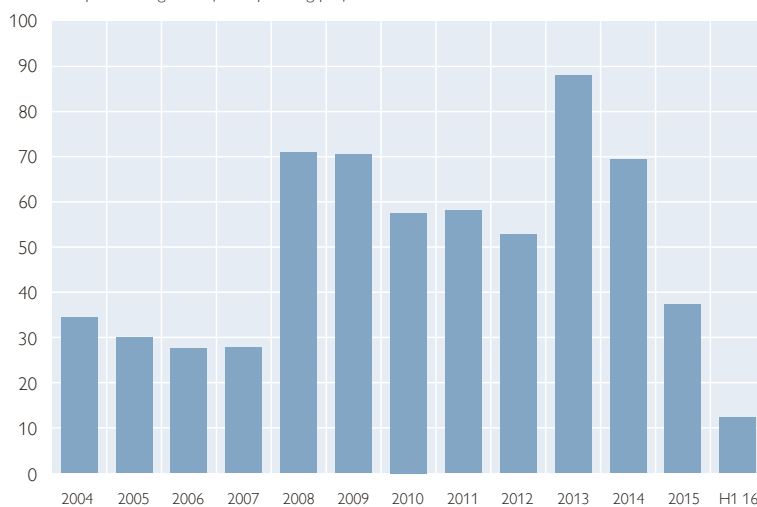
As a consequence of declining operating income and increasing operating costs, the consolidated cost-income ratio of the Austrian banking sector worsened to 72% (up from 60% a year ago) and was markedly above the

Profitability improved due to further reductions in risk provisioning

Chart 17

Risk provisioning of Austrian banks

Credit risk provisioning in % of net operating profit



Source: OeNB.

European average of 63%.¹ This increase was also driven by the previously mentioned restructuring of UniCredit, as (the now reduced) CESEE activities are generally characterized by lower cost-income ratios. This highlights the need for strengthening operational efficiency. There have already been some efforts to address structural issues; these will have to show their long-term effects over time. Noteworthy examples are UniCredit's restructuring and the agreement of the boards of Raiffeisen Zentralbank Österreich and Raiffeisen Bank International on a merger, which should have a positive impact on the cost structure and capitalization of the group.

Consolidation process continues

The ongoing consolidation process in the Austrian banking system is important in terms of international competitiveness. This equally applies to euro area banks as the IMF pointed out in its latest Global Financial Stability Report; the IMF recommends enhancing operational efficiency through rationalizing branch networks. For the

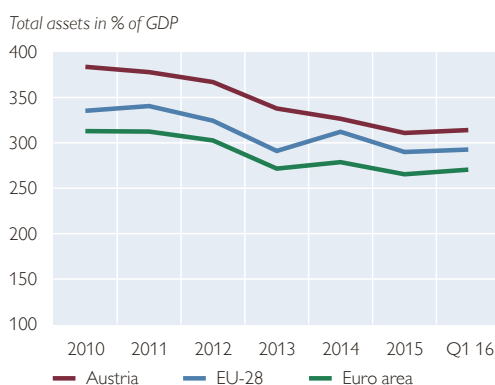
Austrian banking system, the adaptation process continued in the first half of 2016. The total number of credit institutions decreased to 723 in June 2016, down from 739 as at end-2015 and 867 in 2008. At the same time, the consolidated total assets of the Austrian banking sector, which had totaled EUR 1,176 billion in 2008, decreased to EUR 1,062 billion at end-June 2016, corresponding to 314% of GDP. In terms of this percentage, the Austrian banking sector is still larger than the average European banking sector (euro area: 270%; EU-28: 293%)². However, Austrian banks have gradually been coming closer to these averages in recent years, which mirrors first consolidation effects.

Profitability of Austrian subsidiaries in CESEE improved

The profitability of Austrian banks' subsidiaries in CESEE improved considerably in the first half of 2016 as their aggregated net profit increased to EUR 2.1 billion. Therefore, operations in CESEE remain a key source of overall profitability for Austrian banks and continue to offset the relatively weak profitability in the domestic market. Moreover, in the current low interest rate environment in western European countries, CESEE operations may act as a buffer for overall lower interest income, as yields in this region are still higher. Altogether, the restructuring within the UniCredit Group has led to a material decline in the Austrian banking system's exposure to the region. This also means a decrease of total assets by around 40% for the Austrian subsidiaries in CESEE, and a decline in

Chart 18

Total assets of Austrian banking sector in comparison to EU-28 and euro area



Source: OeNB, ECB, Eurostat.

Note: Total assets as of March 2016, GDP as of 2015.

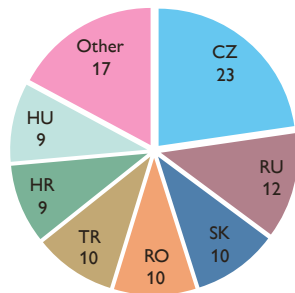
¹ Source: EBA Risk Dashboard (Q2 2016).

² Compare e.g.: United Kingdom: 434%, the Netherlands: 385%, Spain: 337%, Germany: 233%, Italy: 167%, the Czech Republic: 128%, Hungary: 94%.

Chart 19

Composition of Austrian banks' profits in CESEE

%



Total: EUR 2.1 billion

Source: OeNB.

Note: Data as of June 2016.

net profit from the region by more than one-third.

In the first half of 2016, the highest profits continued to come from subsidiaries in the Czech Republic and Russia. Whereas in the Czech Republic profits have remained fairly stable in recent years, Austrian banks' subsidiaries in Russia have registered a decrease in profitability since 2014. However, Russia is still a key market for Austrian banks, as profits are still considerable.

Adjusted for the restructuring of UniCredit Group, the remaining Austrian CESEE subsidiaries faced a reduction in net interest income of nearly 8% in the first half of 2016. The contractions in this (most important) source of income were most pronounced in Russia, Croatia and Hungary.

Trading income recovered sharply, because the result in the first half of the previous year had been burdened by noticeable losses in several countries. Fee and commission income weakened by close to 6%; this is especially worrying in times of increasing pressure on interest income.

The total operating income of Austrian subsidiaries in CESEE decreased by 1% compared to the previous year. At the same time, operating expenses shrank by 2%. As a result, net operating profit remained relatively stable.

In an environment of improving credit quality, Austrian subsidiaries in CESEE significantly reduced credit risk provisioning in the first half of 2016. In this regard, the largest impact came from Hungary, followed by the Ukraine and Croatia. In Hungary and Croatia, the improvement in credit quality was helped by a decline of foreign currency (FX) loan volumes, while lower provisioning in Ukraine was attributable to the country's economic stabilization.

With respect to economic, macro-financial and political risks, however, the outlook for Austrian banks' profitability in the region remains subdued. Therefore, banks are aiming for selective growth in promising markets such as the Czech Republic and Slovakia, while activities in Russia and Ukraine, for example, have been further reduced.

Credit quality improved further

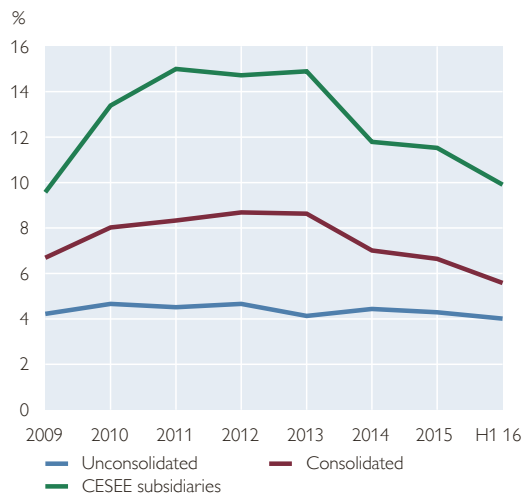
The process of European banks' balance sheet repair has continued in the course of 2016, but credit quality remains weak by historical standards. For the European Union, the nonperforming loan (NPL) ratio came to 5.5% in June 2016³. However, NPL ratios differ markedly across countries, with the highest ratios in financially stressed Member States, which were hit most strongly by the global financial crisis. The increase in the coverage ratio in most countries is probably the result of greater regulatory scrutiny in asset quality reviews, as well as negative developments of collateral values leading to an increase in impairments.

Subsidiaries in CESEE further reduced risk provisioning

³ Source: European Banking Authority.

Chart 20

Nonperforming loan ratios of the Austrian banking sector



Source: OeNB.

Note: Data as of year-end except for 2016.

Austrian banks' NPL ratios continue to improve

The consolidated NPL ratio of the Austrian banking system improved in the first half of 2016, declining by nearly 110 basis points to 5.6% compared to year-end 2015, mainly due to the restructuring of UniCredit Bank Austria's CESEE subsidiaries. Adjusted

for this effect, the remaining improvement can be explained by the better credit quality of corporate loans; loans to households, on the other hand, have seen a slight deterioration. The NPL ratio of the domestic loan portfolio in Austria continued to improve from an already low level.

Austrian banking subsidiaries in CESEE recorded an average NPL ratio of 9.9% at the end of June 2016, which is well below the figure reported a year before (12.0%), continuing an improving trend that has been evident since 2014. The ratio for FX loans is worse than for domestic currency loans (15.3% versus 7.5%), but due to higher loan loss provisioning over the past years, the NPL coverage ratio for FX loans has improved and at 67% is now higher than that for domestic loans (62%), which provides for a certain risk mitigation effect. At the country level, differences in NPL ratios remain high, reflecting heterogeneous economic and foreign exchange developments: In host countries such as the Czech Republic and Slovakia, the ratios remained close

Box 4

Reducing NPLs in the banking system – a key priority of the SSM

Facing the prevailing asset quality problems in the European banking sector, the Single Supervisory Mechanism (SSM) issued guidance on the qualitative treatment of NPLs in fall 2016. For the first time, the published documents define the SSM's supervisory expectations and best practices regarding the treatment of NPLs. In principle, this guidance applies to all significant institutions. However, depending on the level of NPLs at a bank, certain requirements can be waived. The document covers in particular the NPL strategy, NPL governance and operations, forbearance, NPL recognition, NPL impairment measurement and write-offs as well as collateral valuation for immovable property. Moreover, the SSM took stock of selected countries' national frameworks, identifying impediments to NPL reduction.

After the implementation of the qualitative guidance and the stocktaking of the remaining national frameworks not included in the first round, the SSM will continue its work on NPLs. As already announced by the SSM, banks are expected to develop credible and ambitious plans for reducing the NPL stock over time and will also be asked to collect certain key information. In addition, they are expected to adjust their internal organizational structures (if they have not already done so) to deal specifically with the problem of high NPLs.

There are also legal impediments to NPL reduction (e.g. insolvency or tax laws) that are outside regulatory and supervisory competences. Thus, solving the NPL issue will require a coordinated approach involving various legislators and regulatory agencies.

to Austrian levels (4% and 5%, respectively), whereas other countries (e.g. Hungary, Croatia, Serbia) – although having recorded declines during the past year – still show elevated levels close to 17%.

The argument for tackling asset quality issues is compelling for policy-makers, especially in light of the multiple adverse effects of high NPL levels: On the microprudential side, high NPL stocks are associated with lower bank profitability, which, on the macroeconomic side, contributes to stagnant growth in the real economy, as capital is tied up by NPLs and not available for new lending.

European banks' capital levels continue to strengthen, but very high Texas ratios still point to weak asset quality in some countries

European banks' balance sheets are substantially stronger and more resilient than they were before the global financial crisis – they show higher and better-quality capital levels. In the first half of 2016, banks' common equity tier 1 (CET1) ratio improved further to 13.5%.⁴ Nonetheless, investors remain concerned about banks' medium-term profitability in a low growth and low interest rate environment. Furthermore, legacy NPL issues at some banks – particularly in the countries most affected by the financial crisis – together with limited provisioning and/or capital levels (as indicated by still high Texas ratios⁵) hamper the resolution of NPLs. The aggregated Texas ratio of European SSM banks improved (i.e. decreased) to 62% in the first half of 2016 but Texas ratios vary greatly from country to country, with some financial systems display-

⁴ Source: European Banking Authority.

⁵ Source: ECB. The Texas ratio is defined as gross NPLs divided by the sum of provisions for NPLs and (fully loaded) tier 1 capital.

Chart 21

Texas ratios of European banking systems¹



Source: ECB.

¹ SSM banks only.

ing ratios above 100%. Coupled with a coverage ratio of 44%, this means that a complete default of all these banks' NPLs would erase nearly half of their (fully loaded) tier 1 capital.

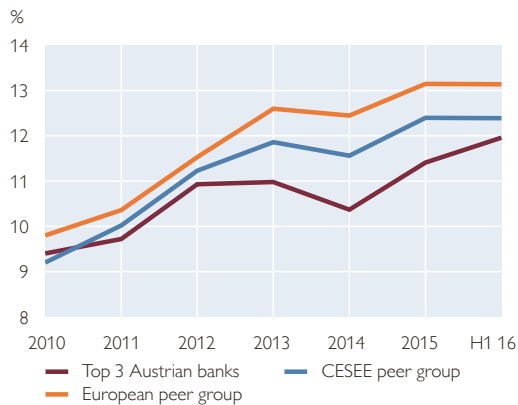
In the first half of 2016, the Austrian banking sector markedly increased its consolidated capitalization due to retained earnings and an increased eligibility of valuation reserves, with its CET1 ratio rising by nearly 40 basis points to 13.2%. In line with this improvement, the leverage ratio of Austrian banks climbed to 6.5%. Given that the banks in the European and CESEE peer groups held their capital ratios broadly stable, the top 3 Austrian banks substantially caught up with these groups, although the gap was not fully closed.

Regarding the above-mentioned credit risk-bearing capacity, the Austrian SSM banks are in a better position than the SSM banks on average, given

CET1 ratio of Austrian banks improved markedly

Chart 22

CET1 ratios in an international comparison



Source: OeNB, S&P Global Market Intelligence.

Note: Data as of year-end except for 2016.

that their aggregated Texas ratio is at 49%, which combined with a well-above average coverage ratio of 55% (SSM average 44%) means that a complete default of all Austrian SSM banks' NPLs would erase less than 30% of their (fully loaded) tier 1 capital.

The regulatory responses to the financial crisis have not yet been completed. However, substantial progress has been made since 2008. In connection with the orderly resolution of banks, the Financial Stability Board has designed a total loss-absorbing capacity standard to improve the resolvability of banks. This standard is applicable to global systemically important banks and will come into force in 2019. On the European level, the Single Resolution Board and national resolution authorities determine the minimum requirement for own funds and eligible liabilities (MREL) for banks on the basis of a case-by-case analysis. This Financial Stability Report includes a study with a first analysis of the buyers of MREL-eligible securities. The analysis

assesses potential contagion channels, if a bail-in were to occur.

Evaluation of the O-SII buffer and the anticyclical capital buffer

The annual evaluation of the capital buffer for other systemically important institutions (O-SII buffer) is based on the ten main indicators defined in the EBA Guidelines (EBA/GL/2014/10). The analysis identified seven banks as O-SIIs (at the consolidated or the sub-consolidated level). For four banks (Erste Group Bank, Raiffeisen Zentralbank Österreich, Raiffeisen Bank International and UniCredit Bank Austria) the analysis implied a 2% O-SII buffer. For the other three banks (BAWAG P.S.K, Raiffeisenlandesbank Oberösterreich, and Raiffeisen-Holding Niederösterreich-Wien), the buffer has been set at 1%. The effective O-SII buffer for UniCredit Bank Austria remained capped at 1% due to the 1% buffer imposed on UniCredit by the Italian authorities. As a consequence, the O-SII buffers and the regime for their phasing-in remained unchanged compared to the FMA regulation of 2015 (Federal Law Gazette II No. 435/2015).

The Financial Market Stability Board (FMSB) recommended that the Financial Market Authority (FMA) should keep the countercyclical capital buffer rate at 0% of risk-weighted assets from January 1, 2017, onward. Results from the recent quantitative and qualitative analyses do not point to excessive credit growth in Austria. Furthermore, total outstanding loans relative to GDP continue to considerably lag behind their long-term trend.

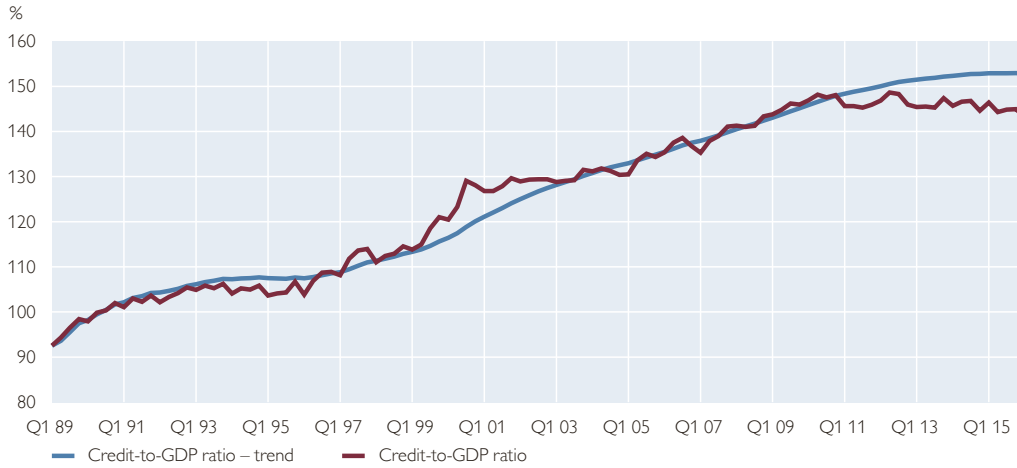
The Austrian supervisory Sustainability Package adopted by the OeNB and the FMA in 2012⁶ stipulates that

CESEE subsidiaries increasingly focus on local stable sources in their funding

⁶ For more details, see <https://www.oenb.at/en/Financial-Stability/Systemic-Risk-Analysis/Sustainability-of-Large-Austrian-Banks--Business-Models.html>.

Chart 23

Credit-to-GDP ratio and its trend in Austria¹



Source: OeNB and Bank for International Settlements (BIS).

¹ The credit-to-GDP gap is the main indicator for assessing excessive credit growth. The gap is defined as the difference between the credit-to-GDP time series (purple line) and credit-to-GDP trend (blue line). A negative gap indicates that the current credit-to-GDP value is lower than its trend.

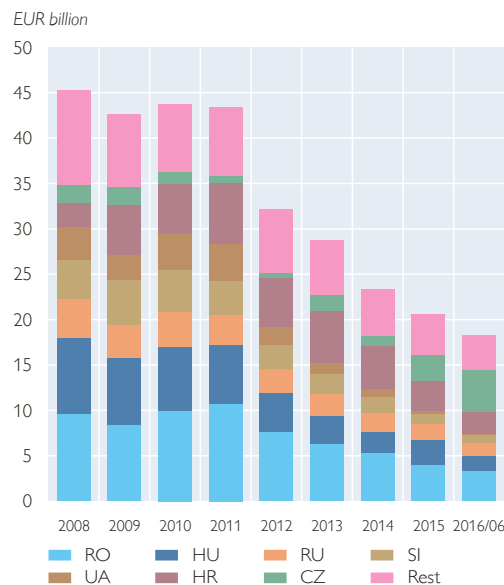
the stock and flow loan-to-local stable funding ratios (LLSFRs) of the foreign subsidiaries of Austria’s three largest banks be monitored. With the transfer of UniCredit Bank Austria’s CESEE subsidiaries to its Italian parent bank, the monitoring requirement now only applies to Erste Group Bank’s and Raiffeisen’s subsidiaries. At mid-2016, all 23 monitored subsidiaries had a sustainable business model (compliant with the supervisory guidance).

Lower LLSFRs have been accompanied by a substantial decrease in the (gross) intra-group liquidity transfers from Austrian parent banks (including UniCredit Bank Austria) to their CESEE banking subsidiaries (by EUR 25 billion or –58% from end-2011 to mid-2016), as these were replaced by local funding. The largest contributors to this broad-based decline were transfers to subsidiaries in Romania (EUR 7 billion), Hungary (EUR 5 billion), Croatia and Ukraine (EUR 4 billion each). Very few countries saw intra-group liquidity transfers increase, with the situation

of Austrian subsidiaries in the Czech Republic particularly noteworthy: In their case, this volume increased from

Chart 24

Intra-group liquidity transfers to CESEE subsidiaries



Source: OeNB.

Note: Liquidity transfers to credit institutions only.

less than EUR 0.7 billion in 2011 to more than EUR 4.6 billion in mid-2016.

Residential real estate-related systemic risk contained in Austria

The assessment of systemic risk in Austria related to residential real estate (RRE) is based on a comprehensive approach. It takes into account data on (1) real estate price developments, (2) the resilience of borrowers with regard to shocks to income, interest rates, and RRE prices as well as (3) the risk-bearing capacity of credit institutions with respect to increases of mortgage defaults in combination with RRE price decreases. The analysis includes estimates of the systemic effects of contagion and common exposure to RRE in case of market-wide shocks. Finally, it places the results in the context of the Austrian housing market.

Since 2010, RRE prices have increased in Austria, especially in Vienna. In addition to the mitigating factors discussed in the section on corporate and household sectors in Austria, the potential systemic risk for the financial sector is relatively limited: The share of mortgage loans in Austria is low rela-

tive to GDP (28%). Comparable small open economies with mature financial systems like Belgium, Finland, Sweden and the Netherlands record values between 44% and 67%.⁷ In Austria, the average risk weight in the IRB approach is among the highest in Europe (25%). In Belgium, Finland, Sweden and the Netherlands, average risk weight values range from below 10% to 22%. Similarly, Austrian banks' risk-bearing capacity regarding their mortgage loan exposure is relatively high. The ratio of total mortgage loans to CET1 stands at 165%. The respective ratios in the four comparable countries range from 410% to 640%.

The Austrian authorities regard RRE-related systemic risk in Austria as contained as they are confident that they have taken appropriate and effective measures to address the potential buildup of RRE-related systemic risk as highlighted in the warning issued by the European Systemic Risk Board (ESRB) regarding medium-term vulnerabilities in Austria's residential real estate sector.

Residential real estate price growth mitigated by various factors

⁷ For international comparisons see: ESRB Report, *Vulnerabilities in the EU residential real estate sector*.

ESRB issues warning against vulnerabilities in Austria's residential real estate sector

The European Systemic Risk Board (ESRB) has issued a warning regarding medium-term vulnerabilities in Austria's residential real estate sector. The ESRB considers the main vulnerabilities to be the robust growth in residential real estate prices and mortgage loans, and warns against the risk of loosening lending standards. The OeNB welcomes the efforts the ESRB has put into analyzing the Austrian residential real estate market and shares many of the findings of the ESRB.

However, the ESRB has insufficiently taken into account crucial factors that mitigate the vulnerabilities of Austria's residential real estate market as identified in its assessment: Though considerable price increases have indeed occurred in Austria recently, it is important to emphasize that residential real estate price increases in Austria started from a comparatively low level. Moreover, in Vienna, where house price increases have been particularly strong in recent years, only about 18% of households are owner occupiers and only 6% of households have mortgage debt according to microdata evidence (Household Finance and Consumption Survey, HFCS; for further details please refer to boxes 1 and 3 in this report). These low homeownership rates, in conjunction with a well-developed rental market with a high share of subsidized housing, limit the incentive and need for vulnerable households to become homeowners and thus limit associated systemic risks. The aggregate indebtedness of the household sector is comparably low and has not increased in recent years. Also, the share of mortgage loans in Austria is comparatively low relative to GDP and relative to banks' tier 1 capital.

In addition, the ESRB warning does not take into account additional measures by the Financial Market Stability Board (FMSB), which were introduced in September in order to prevent the emergence of residential real estate-related systemic risks.¹ These new measures encompass sustainability requirements on loan-to-value, debt service-to-income, and debt-to-income ratios as well as on risk management practices and risk pricing. The FMSB will continue to closely monitor the sustainability of lending standards and specify the criteria for the aforementioned limits in greater detail. The FMSB has also advised the Federal Minister of Finance to take preventive action and expand the macroprudential toolbox by providing the legal instruments for imposing limits on the loan-to-value ratio, the debt-to-income ratio or the debt service-to-income ratio in new lending.² The Austrian authorities are currently preparing a draft law in order to establish the legal basis for the aforementioned instruments.

Taking a comprehensive view of real estate developments, i.e. also taking into account mitigating factors as well as recent policy actions, the OeNB deems the current policy stance sufficient in view of the current real estate cycle. Nevertheless, the OeNB places high priority on monitoring developments in the domestic real estate market, and the Austrian authorities stand ready to act if necessary.

¹ <https://www.fmsg.at/en/publications/press-releases/Ninth-meeting.html>.

² <https://www.fmsg.at/en/publications/warnings-and-recommendations/advice-2-2016.html>.

On September 23, 2016, the Austrian authorities introduced additional measures to prevent the emergence of residential real estate-related systemic risks in Austria. These include sustainability requirements on three ratios (loan-to-value, debt service-to-income and debt-to-income ratios) as well as on

risk management practices and risk pricing.

The Financial Market Stability Board (FMSB) calls for conservative loan-to-value (LTV) ratios to ensure that there is sufficient buffer to avoid collateral stretch in case of falling real estate prices. Furthermore, the FMSB

Sustainable lending standards crucial for maintaining stability and growth

requires banks to consider debt service-to-income (DSTI) and debt-to-income (DTI) ratios in their risk management to address a potential household stretch: Households must be able to service debt even under stress scenarios such as reductions of household income and unexpected payment obligations. The debt service capacity of households must also be resilient to plausible interest rate shocks, leading to a sharp increase in debt service obligations. Finally, the pricing of mortgage loans must be risk adequate, reflecting credit risk as well as the costs of liquidity and capital.

The FMSB announced that it will continue to closely monitor the sustainability of lending standards in real estate lending. In Austria, LTV ratios already play a key role in the eligibility of mortgages for Pfandbrief (i.e. covered bond) issuances (maximum LTV

ratio of 60%) and in the regulation of building societies (maximum LTV ratio of 80%). Analysis by the SSM and comparisons across European countries that have already introduced sustainability initiatives suggest that LTV ratios above 80% point toward high risk. At the same time, DSTI ratios of up to 30% are considered low risk, and DTI ratios of up to about six times net income are seen as medium-low risk. On the basis of improved reporting, the FMSB may specify in greater detail the criteria of sustainability and issue recommendations if the need arises.

On June 1, 2016, the FMSB advised the Federal Minister of Finance to take preventive action and expand the macroprudential toolbox by providing the legal instruments for imposing limits on LTV, DTI and DSTI ratios in new lending.⁸

Borrower-related
macroprudential
instruments
necessary

Box 6

Variable interest rate loans in Austria

The majority of loans to customers in Austria are loans with a variable interest rate, i.e. with a floating rate or an initial rate fixed for a period of up to 1 year. In September 2016, the share of variable rate loans in total loans to households and nonfinancial corporations (for new business, denominated in euro) was 83%, well above the euro area average of 62%. Although the ratio in Austria was even higher until recently and although the low interest rate environment has led to some rethinking among consumers, Austrian borrowers still bear considerable interest rate risks.

The high popularity of variable rate loans in Austria is due to factors on both the supply and the demand side. Borrowers with variable interest rate loans benefit if market interest rates go down. In this case interest expenses decline and disposable income increases. On the other hand, if interest rates rise, borrowers face additional interest expenses. Borrowers with a fixed rate loan avoid this kind of risk. However, the interest rates on fixed rate loans are typically higher than for variable interest rate loans, as banks usually hedge against interest rate risk and add those hedging costs to the cost of borrowing. Another disadvantage for borrowers with fixed interest rate loans is that banks can charge a contractual penalty if the loan is redeemed prematurely.

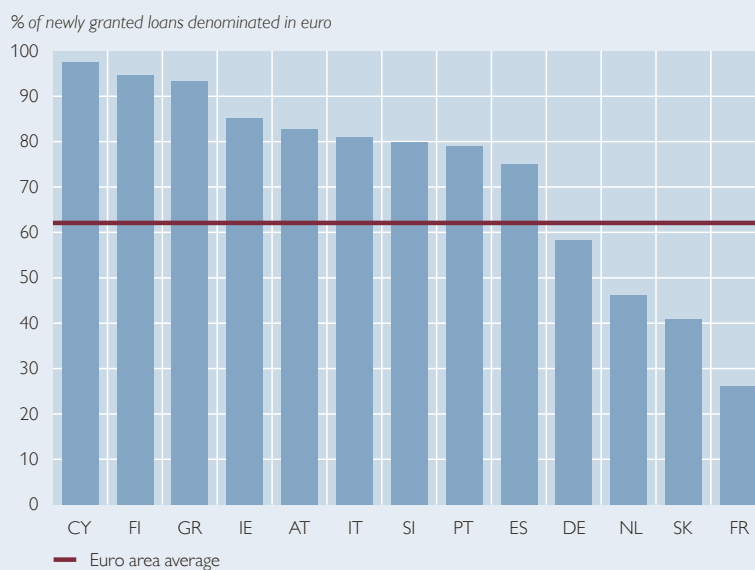
For banks, there are mainly two risks in connection with variable rate loans. When interest rates rise, interest expenses increase for the borrowers. If this has not sufficiently been taken into account by the borrowers, their repayment capacity declines, which can subsequently lead to a deterioration in credit quality. Another risk for banks is that an environment of very low or even negative interest rates also affects banks with a high share of variable rate loans (see “From low to negative rates: an asymmetric dilemma” in the special topics section of this Financial Stability Report).

⁸ <https://www.fmsg.at/en/publications/warnings-and-recommendations/advice-2-2016.html>.

In such a case, an asymmetric dilemma creates additional pressure on banks' net interest margins: For deposits, there is a legally stipulated zero lower bound on the rate. On the asset side of banks, however, variable rate loans are linked to a reference rate like the EURIBOR (stipulated in the loan contract) and a negative reference rate has to be passed on to interest charged on loans (until the total rate of the loan, i.e. reference rate plus add-on, reaches zero).¹ As a consequence, a squeezing of banks' margins is expected, should rates drop further into negative territory.

Chart

Share of variable rate loans in total loans to households and corporations



Source: ECB.

Note: Data as of September 2016

But there are also risks for banks in case of fixed rate loans. Here, the interest rate risk shifts from the borrower to the bank. As noted above, the bank usually tries to hedge against this risk via interest rate swaps. However, some party in the system – typically a bank – has to bear that risk.

One possibility to reduce the risks associated with variable rate loans for borrowers is to raise awareness for financing costs in case of higher interest rates. As an example, banks should discuss calculations showing monthly payment rates in hypothetical interest rate scenarios with the borrower. Austrian mortgage and property loan law prescribes that banks have to run a scenario in which they simulate the interest expenses borrowers would have to bear if the most adverse interest rate development of the last 20 years were to occur. The results have to be declared in writing and handed to borrowers at the time a loan is granted.

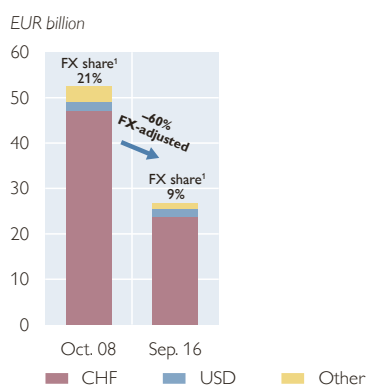
¹ This sentence reflects the outcome of several court cases. While a total negative interest on customer loans is ruled out, negative reference rates need to be passed on until the total rate reaches zero (Oberlandesgericht Innsbruck, 4 R 58/16k, July 14, 2016, AK vs. Hypo Tirol). See also court case decisions dealing with Swiss-franc foreign currency loans where the reference rate, CHF LIBOR, moved into negative territory already at year-end 2014: Landesgericht Feldkirch (5 Cg 18/15z, August 28, 2015, VKI vs. Raiffeisenbank am Bodensee), Handelsgericht Wien (57 Cg 10/15v, September 24, 2015, VKI vs. UniCredit BA) and Landesgericht Eisenstadt (27 Cg 32/15x, November 15, 2015, VKI vs. HYPO-BANK Burgenland).

Foreign currency loans in Austria show a remarkable decline

In September 2016, FX loans to domestic nonbank borrowers amounted to EUR 31.6 billion, of which around EUR 22.3 billion are FX loans to households and EUR 4.7 billion are attributable to nonfinancial corporations.⁹ FX loans to domestic nonfinancial borrowers have declined continuously since October 2008, when the FMA strongly recommended that banks refrain from granting new FX loans to households¹⁰ (see chart 25). Between then and September 2016, FX loans to households and nonfinancial corporations shrank by 58% and 68%, respectively (adjusted for exchange rate effects). Consequently, the share of FX loans in Austria has fallen sharply: In September 2016, 9% of all loans to households and nonfinancial corporations were denominated in a foreign currency, a level more than 11 percentage points below that of October

Chart 25

Austria: change in foreign currency loans to households and nonfinancial corporations since supervisory measures have been taken



Source: OeNB.

¹ Foreign currency loans in total loans.

2008, with the Swiss franc the dominant currency for FX loans to households (accounting for 96%).

Foreign currency loans linked to repayment vehicles: multi-fold risks

In June 2016, the outstanding amount of repayment vehicle (RPV) loans in Austria denominated in foreign currency was EUR 17 billion, with RPV loans denominated in euro playing a minor role (EUR 3 billion). Both values have declined since end-2008, by 44% and 45%, respectively (not adjusted for exchange rate effects).

About three-quarters of FX loans to households are designed as RPV loans, which means the borrower pays regular contributions into an RPV, usually a life insurance policy or other capital market product, to repay the loan at the end of its term. This implies that borrowers are exposed to two main risks: first, the risk that the amount to be repaid at maturity increases as a result of foreign currency appreciation (exchange rate risk) and second, the risk that the originally assumed performance of the RPV is not reached and the amount saved in the RPV does not cover the entire loan repayment due at maturity (performance risk). Both risks may lead to funding gaps between the repayment vehicle's final value and the amount outstanding at loan maturity.

To monitor the development of RPV loans (especially those denominated in foreign currency) and to gain an overview of borrowers' funding gaps, the OeNB, in cooperation with the FMA, conducted a survey in mid-2016 among a representative sample of Austrian

Total funding gap:
EUR 6.2 billion
(end-2015)

⁹ The remaining FX loans were extended to the government sector (EUR 2.7 billion) and nonbank financial intermediaries (EUR 1.9 billion).

¹⁰ More details on the latest version of the "FMA-Minimum Standards for the Risk Management and Granting of Foreign Currency Loans and Loans with Repayment Vehicles" (2013) can be found at <https://www.fma.gv.at/download.php?d=1400>.

banks.¹¹ The results show that, at the end of 2015, the total funding gap was approximately EUR 6.2 billion. However, this is a volatile figure due to currency movements and the performance of RPVs. On average, borrowers' RPVs were underfunded by 29%.

Based on the remaining maturity profile of RPV loans, there is still some time to close borrowers' funding gaps, as more than 75% of all RPV loans have remaining maturities of more than 7 years and a large share (35%) will mature in 10 to 15 years (see chart 26). Those funding gaps may, however, pose problems for Austrian banks and their customers in the medium to long term, and could widen even further, if downside risks were to materialize (especially adverse financial market and/or Swiss franc movements). Consequently, the OeNB and FMA are intensifying their efforts to encourage banks and borrowers to engage in bilateral negotiations over measures to enable sustain-

able, tailor-made solutions and reduce the risks stemming from RPV loans.

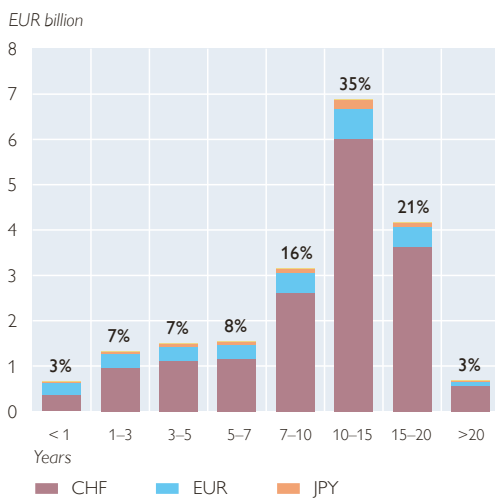
Austrian CESEE subsidiaries reduce their exposure to foreign currency loans

By mid-2016, the total volume of FX loans of Austrian banking subsidiaries in CESEE had decreased by more than half year-on-year to EUR 33 billion (–55% adjusted for exchange rate effects), with the share of FX loans in total loans dropping from 39% to 31%. These substantial short-term declines are mainly due to UniCredit Group's restructuring of its CESEE operations. But they also highlight continued long-term efforts by banks and regulators to reduce FX loans in the region over past years, as the foreign exchange-adjusted decline was –38% from end-2010 to mid-2016 for all remaining Austrian subsidiaries (i.e. excluding those of UniCredit Bank Austria). Nonetheless, political uncertainties with regard to legal initiatives directed at FX loans remain high in the region (e.g. in Poland) and could result in a further financial burden for Austrian banks.

More than one-third of all repayment vehicle loans mature in 10 to 15 years

Chart 26

Residual maturity profile of repayment vehicle loans (mid-2016)

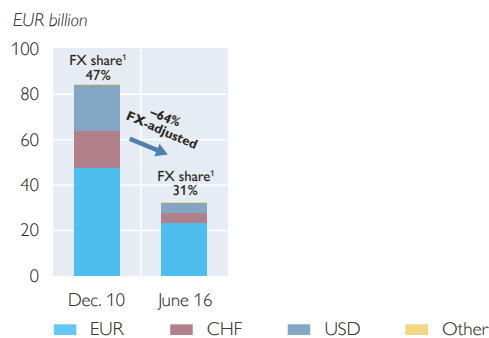


Source: OeNB.

Note: Percentage values indicate the share of each segment in the total volume of outstanding repayment vehicle loans.

Chart 27

CESEE: change in foreign currency loans to households and nonfinancial corporations since supervisory measures have been taken



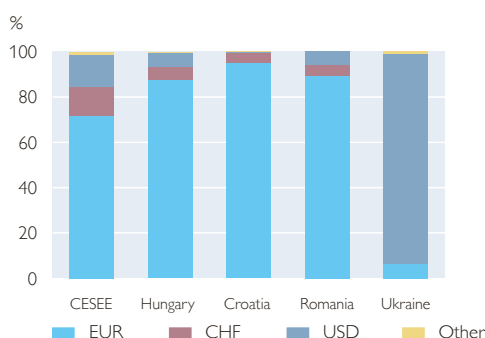
Source: OeNB.

¹ Foreign currency loans in total loans.

¹¹ The sample covered about 90% of outstanding domestic RPV loans. Similar surveys were carried out in 2009, 2011 and 2015.

Chart 28

Currency composition of foreign currency loans of Austrian banking subsidiaries in CESEE



Source: OeNB.

Note: Data as of mid-2016.

being the dominant currency (about two-thirds in the former and three-quarters in the latter category). As displayed in chart 28, 72% of all FX loans are denominated in euro, about 14% in U.S. dollars and 13% in Swiss francs, but the currency split is heterogeneous across countries: In Hungary, Romania and Croatia the vast majority of FX loans are denominated in euro, while Russia and Ukraine display high levels of U.S. dollar FX loans.

The FX leasing volume of Austrian subsidiaries in CESEE also experienced a steep decline (–61% year on year) and amounted to roughly EUR 1.5 billion at mid-2016, while Austrian banks' direct FX lending to CESEE decreased (–8% year on year), coming to EUR 32 billion, of which three-quarters were denominated in euro and nearly a quarter in U.S. dollars.

Currency composition differs across countries

FX loans extended to households and nonfinancial corporations, respectively, make up 39% and 61% of the outstanding volume of FX loans, with the euro

Box 7

Strengthening the cyber resilience of financial market infrastructures – a new framework

Following several major incidents, cyber resilience is currently on everyone's lips and considered as one of the most important challenges in the oversight of financial market infrastructures (FMIs, i.e. payment systems, central securities depositories and central counterparties). Whereas operators of FMIs have been dealing with cyber threats for a long time, this topic is quite new for regulators and overseers.

Against this background, the Committee on Payments and Market Infrastructures (CPMI) and the Board of the International Organization of Securities Commissions (IOSCO) released a first "Guidance on cyber resilience for financial market infrastructures" in June 2016. The cornerstones of this guidance are sound cyber governance with senior management attention and a culture of cyber risk awareness throughout each institution. A further key element is cooperation within the FMI's environment (which primarily consists of the various stakeholders and similar FMIs) regarding information-sharing practices, high-quality threat intelligence and risk assessments. Other chapters of the guidance deal with best practices regarding incident identification and monitoring, the ability to quickly resume operations in case of successful cyber attacks, institutionalized change management and testing procedures as well as an ongoing re-evaluation and improvement of the cyber resilience framework to learn from previous attacks and adapt to possible new threats. The guidance is directed at FMIs. However, relevant authorities are also expected to comply when carrying out their regulatory responsibilities. In this context, the oversight function of the ESCB is currently developing a consistent European approach regarding the implementation of the guidance.

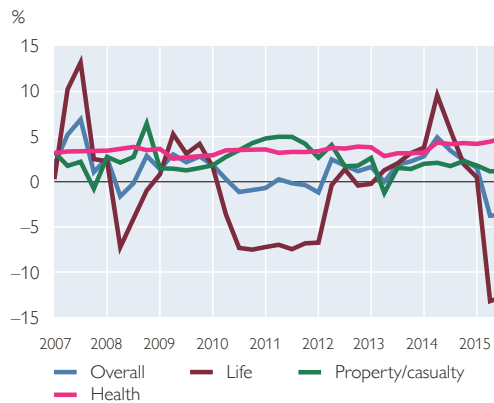
The OeNB, too, is closely following these developments and regularly conferring with banking supervisors in an effort to adapt the existing framework for its oversight activities. Specific audits of FMIs' cyber resilience have been initiated and will be intensified in the future.

Prolonged period of low interest rates challenges the profitability of the insurance sector

Low profitability caused by a prolonged period of low interest rates and weak macroeconomic growth remains the key risk for the insurance sector. Not all institutions are equally affected by this challenging environment depending on product or business lines, maturities of liabilities and levels of guaranteed interest rates on the outstanding stock. As chart 29 shows, premium growth has been rather stable for property/casualty and health insurance, while a sharp decline of more than 10% can be observed for the life insurance business in 2016. The latter was driven by a fall in single-premium life insurance policies, which witnessed a dramatic decline of new business (–41%). This challenging environment (i.e. what has been dubbed the “new normal”) needs to be addressed, and the insur-

Chart 29

Yearly growth of insurance premiums



Source: FMA.

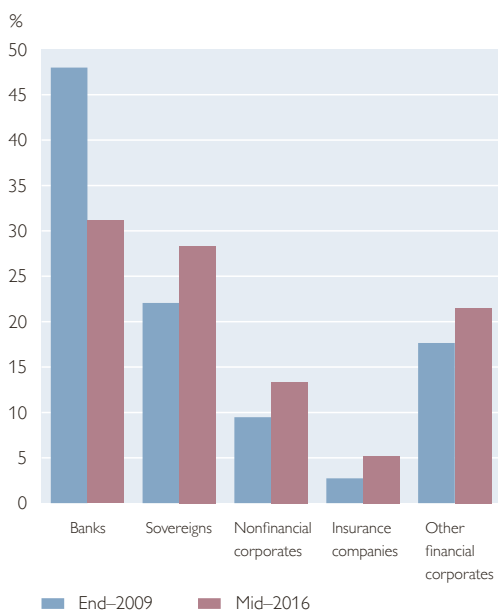
ance sector continues to react by shifting its business mix toward products that are directly linked to market performance and where the investment risk is borne by the policyholder.

Besides the macroeconomic environment, insurance companies also face regulatory challenges, as Solvency II

Chart 30

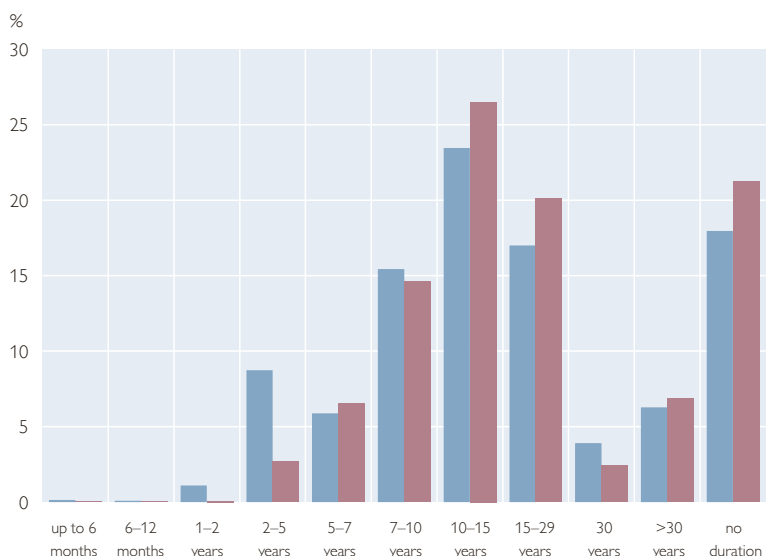
Considerable changes in investment behavior of Austrian insurance companies

Asset allocation of insurers' investments in securities



Source: OeNB.

Original maturity of insurers' investments in securities



entered into force in 2016. Chart 30 shows how Austrian insurance companies have modified their investment behavior to adapt to these new rules. From end-2009 to mid-2016, the securities investments of Austrian insurance companies show a notable shift away from investments in bank securities (–17 percentage points) toward government bonds (+6 percentage points), nonfinancial corporations (+4 percentage points) and insurers (+2 percentage points). There has also been a shift in terms of securities’ duration, from short durations (2 to 5 years) toward the 10- to 15- and 15- to 29-year dura-

tion band, as the low yield environment makes short-term securities particularly unattractive.

Currently, the European Insurance and Occupational Pensions Authority (EIOPA) is conducting a stress test for the European insurance sector. This regular exercise is aimed at assessing the resilience of the sector to severe adverse market developments. In 2016, it focuses on two major market risks: the prolonged low yield environment and the so-called “double hit” scenario, which combines low interest rates with a negative shock to asset prices. The results will be published in December 2016.

Special topics

The profitability of Austrian banking subsidiaries in CESEE: driving forces, current challenges and opportunities

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This study analyzes the driving forces behind the profitability of Austrian banking subsidiaries in Central, Eastern and Southeastern Europe (CESEE) from 2003 to 2015, with a particular focus on the aftermath of the global financial crisis, which marked a turning point for their risk-return characteristics. We start off with an analysis of operating income and expense trends and delve into an analysis of credit risk costs. Then we look at large extraordinary one-off cost items before summing up with a long-term revenue bridge and an analysis of the most recent risk-return metrics. Overall, we find that the subsidiaries generated substantial profits, which have to be seen in the light of significant writedowns of their book values at the parent level. Regarding current challenges, operating profits are under pressure from falling net interest margins and fading organic growth, while remaining foreign currency loans might lead to further one-off costs, which in the past offset efficiency improvements. Credit risk also remains high in some countries, but a positive trend has emerged over the past years and provisioning levels have improved. One lesson learned in this respect is that rapid credit growth before the crisis typically led to high nonperforming loan (NPL) ratios, which now weigh on some subsidiaries' ability to lend. Looking forward, banks continue to face a challenging environment in the CESEE region with little low-hanging fruit, as the speed of macroeconomic catching-up has slowed and low interest rates have taken hold. Therefore, Austrian banks' subsidiaries should diversify their income base, maintain their operating cost discipline and continue to strive for risk-adequately priced products in order to keep their profitability on a sustainable footing.

JEL classification: G01, G21

Keywords: banking, financial crisis, Austrian banks, bank profitability, net interest income, net interest margin, operating expenses, credit risk, NPL, writedowns, foreign currency loans, Texas ratio, CESEE

Austrian banking subsidiaries in CESEE² generated more than EUR 25 billion in profits between 2003 and 2015, contributing significantly to the overall profitability of the Austrian banking system. In absolute numbers, the Czech Republic, Russia, Slovakia and Croatia were the most profitable markets (see chart 1), accounting for nearly 80% of total profits over the entire period of 13 years. Yet, not all host markets have been profitable; some subsidiaries, especially in countries with higher macro-

economic and/or political uncertainty, recorded overall losses, with activities in e.g. Hungary, Ukraine and Slovenia weighing on Austrian banks' CESEE profitability.

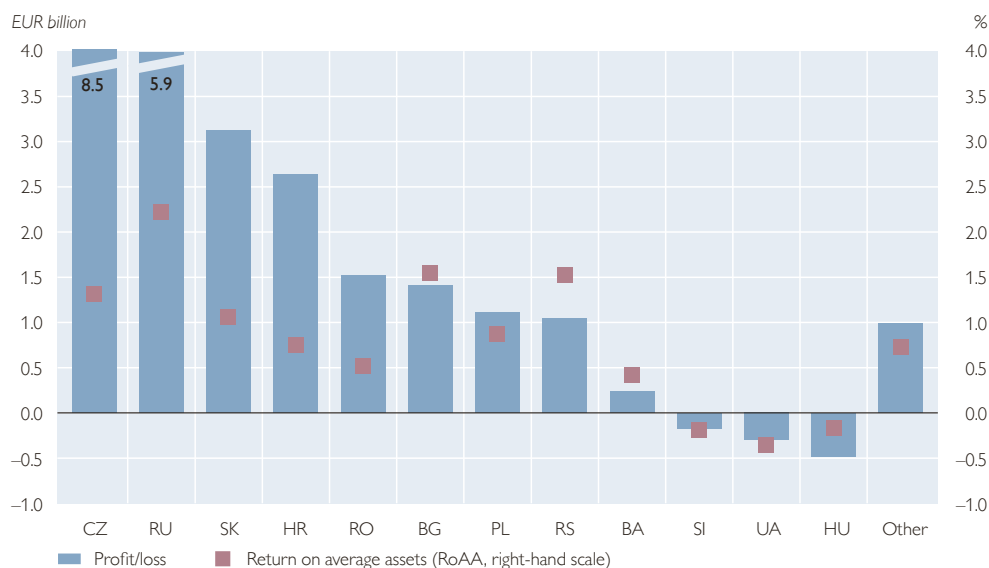
Absolute profit figures are obviously influenced by the size of subsidiaries' balance sheets. Therefore, a look at their relative profitability is equally important. The return on average assets (RoAA) eliminates size disparities, thereby allowing a more meaningful comparison of different markets. The RoAA of all

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² We analyze data of all Austrian banking subsidiaries in CESEE for the period from end-2003 to end-2015, irrespective of the subsidiaries' ownership structure. In this paper, CESEE includes the EU Member States Bulgaria, Croatia, the Czech Republic, Hungary, Latvia, Poland, Romania, Slovakia, and Slovenia as well as Albania, Belarus, Bosnia and Herzegovina, Kazakhstan, Kosovo, Kyrgyzstan, the former Yugoslav Republic of Macedonia, Montenegro, Russia, Serbia, Tajikistan, Turkey and Ukraine.

Chart 1

Accumulated profit/loss and RoAA of Austrian banks' subsidiaries in CESEE between 2003 and 2015



Source: OeNB.

Austrian subsidiaries in CESEE between 2003 and 2015 was 0.9%. Countries with large absolute profits were not always the most profitable in this respect, as some of these markets display a higher level of economic and financial development and generate lower margins due to increased competition.

In this study, we analyze the driving forces behind this profitability – especially after the global financial crisis (GFC)³ – by dissecting the profit and loss statements of Austrian banking subsidiaries in CESEE. Given that the period covered (2003–2015) was characterized by two very different subperiods, we often distinguish between the period before the GFC (2003–2008, the expansion phase) and its aftermath (2009–2015, the consolidation phase). These two periods differ not only in terms of the prevailing business environment and growth dynamics, but

also in terms of the sample of banks analyzed and their business models, given that the expansion phase was characterized by a succession of acquisitions, while the consolidation phase saw several subsidiary divestments and fundamental changes to some business models.

Section 1 provides an analysis of operating income with a special focus on net interest income and the net interest margin, and section 2 examines trends in operating expenses and the cost-income ratio. We then delve into an analysis of credit risk and its associated costs (section 3) and look at large as well as potential one-off cost items, i.e. consolidated writedowns of the subsidiaries' book values and the (remaining) foreign currency loan exposure (section 4). The study concludes with a profitability overview in the form of a revenue bridge and a brief cluster analysis of 2015 data (section 5).

³ We use the term GFC for the bank crisis that followed the collapse of the U.S. investment bank Lehman Brothers in 2008.

1 Operating income under pressure despite continued increase in total assets

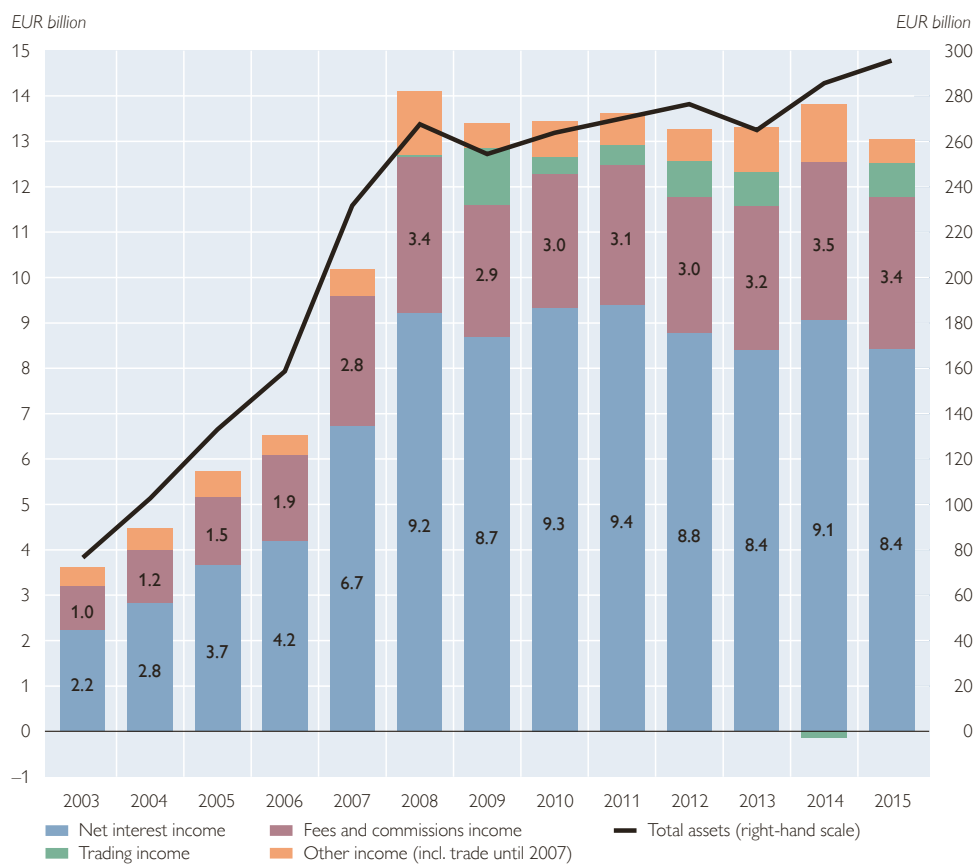
Before the GFC started to affect business activities in CESEE, the operating income of Austrian subsidiaries showed rapid growth in the early 2000s and especially in 2007 and 2008, when the CESEE economies were catching up rapidly and Austrian banks acquired new subsidiaries abroad, resulting in a quadrupling of income from 2003 to 2008. This growth was in line with and even outpaced the general expansion of Austrian banks' exposure to the region, which was marked by a 3.5-fold

increase of total assets. In the aftermath of the GFC, operating income came under pressure despite a continued – albeit markedly slowed down – increase in the aggregate balance sheet size: While total assets expanded by 10% from end-2008 to end-2015, operating income contracted by 7% (see chart 2).⁴

The following subsections explain this divergence that have adversely affected Austrian CESEE subsidiaries' profitability since 2009, focusing on the main income drivers: (1) net interest income, which throughout the entire time period made up around two-thirds

Chart 2

Breakdown and growth of operating income



Source: OeNB.

Note: Data for all Austrian CESEE subsidiaries at year-end.

⁴ In this section, data are not adjusted for exchange rate movements, so their impact on the growth rates is not accounted for.

of operating income and reflects the subsidiaries' retail business models, and (2) fees and commissions income, which contributed about one-quarter and has been cited as a potential new avenue for profit generation.

Net interest income negatively affected by strong margin pressure

Net interest income (NII) is by far the most important component of operating income and has come under pressure over the past few years. This trend was only interrupted in 2014 (when data of a subsidiary in Turkey were reported for the first time⁵), but became clearly visible again in 2015. In order to analyze this source of income, we dissect its changes into a volume and a price effect, using the total spread (i.e. a margin/price) on interest-earning assets and interest-bearing liabilities (i.e. volumes) according to a formula proposed by the ECB. This formula defines the total spread as the combination of a spread – i.e. interest revenue per interest-earning asset (IEA) minus interest expense per interest-bearing liability (IBL) – and an endowment effect, which “measures the gain from the fact that some part of IEA does not have an interest cost. [...] This calculation disregards the cost of equity capital.” (ECB, 2000, p. 27).

As described above, the aggregate balance sheet of Austrian CESEE subsidiaries has continued expanding after 2008, but its composition has changed substantially (see chart 3). While the share of loans to nonbanks (after provisioning) in total assets decreased from 64% to 60% from end-2008 to end-

2015 and the absolute loan level barely increased, the share of debt securities (mostly sovereign bonds) rose from 11% to 17%. During the same period, changes on the liability side were even more significant: The share of deposits from credit institutions (including parent banks) in total assets declined from 27% at end-2008 to 13% at end-2015, and this decrease was compensated for by a strong rise in deposits from non-banks (54% to 68%). At first sight, these changes in the asset and liability mix point to a shift to relatively lower-yielding assets (sovereign bonds vs. loans to the real economy) and potentially more costly funding sources (local deposits from nonbanks vs. intra-group liquidity transfers by parent banks). Whether and how this affected the average yield on IEAs and the costs of IBLs is analyzed below. Prior to this, it is worth noting that volume growth in aggregate (average) IEAs and IBLs over the past years has mostly been related to the subsidiary in Turkey,⁶ while growth also occurred in the Czech Republic and Russia, among others, whereas (average) IEAs and IBLs declined e.g. in Hungary, Romania and Ukraine.⁷

The CESEE subsidiaries' total spread, which stood at close to 4% before the GFC, declined to barely above 3% (especially since 2011–12), marking an overall decline by 78 basis points from 2008 to 2015 (see chart 4). More than three-quarters of this deterioration were caused by a falling spread, i.e. the margin between the average yield on IEAs and the average cost of IBLs. With the exception of 2014, when develop-

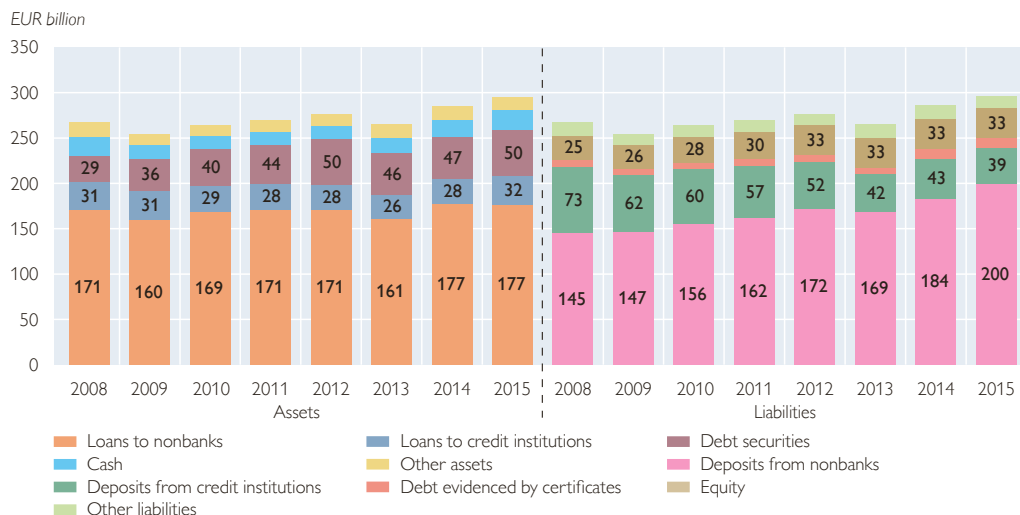
⁵ In 2005, Koç Financial Services (a 50/50 joint venture between UniCredit and Koç Group) agreed to acquire a stake in the Turkish bank Yapı ve Kredi Bankası A.S. As of August 2016, 81.8% of the bank's shares were owned by Koç Financial Services (Yapı Kredi, 2016). Standardized supervisory reporting data for this joint venture were first submitted in the first quarter of 2014 and had a large impact on all CESEE aggregates.

⁶ Please refer to footnote 5 for more details.

⁷ Due to data limitations, the calculation of average IEAs and IBLs for 2008 relies on data from March 2008 as a proxy for end-2007 data for certain types of IEAs and IBLs (e.g. debt securities).

Chart 3

Breakdown and growth of the aggregate balance sheet



Source: OeNB.

Note: Data for all Austrian CESEE subsidiaries at year-end.

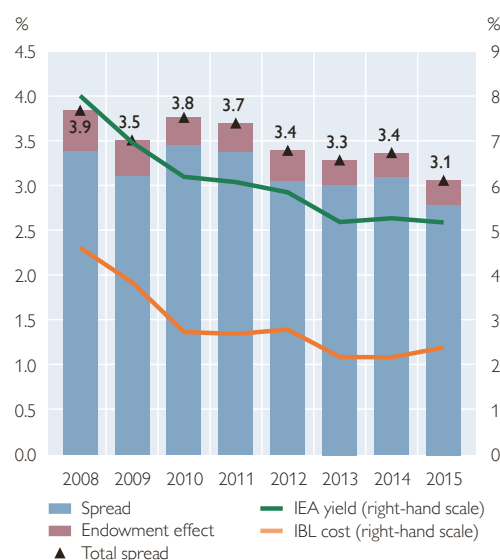
ments were subdued on all fronts, 2010 was the only year in which Austrian CESEE subsidiaries saw their spread expanding (+35 basis points), which was due to their funding costs falling faster (−111 basis points) than their yield on IEAs (−77 basis points). In all other years, the spread narrowed, leading to an overall decline by 60 basis points as the yields on IEAs fell more sharply than the refinancing costs (−283 basis points vs. −223 basis points). To cut a long story short, cheaper funding in a lower interest rate environment was not able to fully compensate for the receding profitability of banks' assets.

The bottom line of our analysis of NII drivers in the aftermath of the GFC is that an adverse price effect (i.e. margin pressure) was the main reason for the decline in NII, while organic volume growth faded and no longer contributed positively to NII over the past three years (see chart 5).⁸ Due to a combination of slower economic catch-

ing-up of CESEE host markets after the GFC (with substantially smaller gaps to Western European peers for some),

Chart 4

Breakdown of the total spread



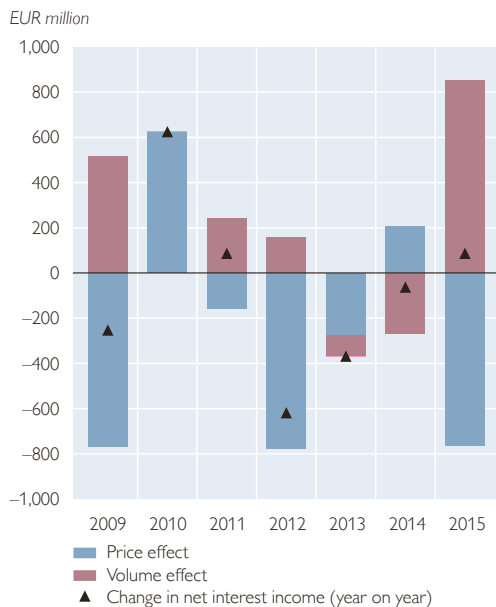
Source: OeNB.

Note: For the sake of consistency, the sample of banks was adjusted to include only those subsidiaries in each year that reported data from the beginning to the end of that year.

⁸ The volume effect shown in chart 5 for 2015 is primarily due to the fact that the subsidiary in Turkey reported its first full year of data. Please refer to footnote 5 for more details.

Chart 5

Effects on net interest income



Source: OeNB.

Note: For the sake of consistency, the sample of banks was adjusted to include only those subsidiaries in each year that reported data from the beginning to the end of that year.

selective withdrawal plans of some Austrian parent banks and an ongoing low interest rate environment, pressures on NII are likely to persist over the coming years, but the heterogeneity of the region might provide for pockets of growth in less competitive and/or more dynamic markets. Given the importance of NII for the profitability of Austrian banking subsidiaries in CESEE, trends in their interest margins will be of utmost importance for the sustainability of their business models.

Fees and commissions income could not offset the decline in net interest income after 2008

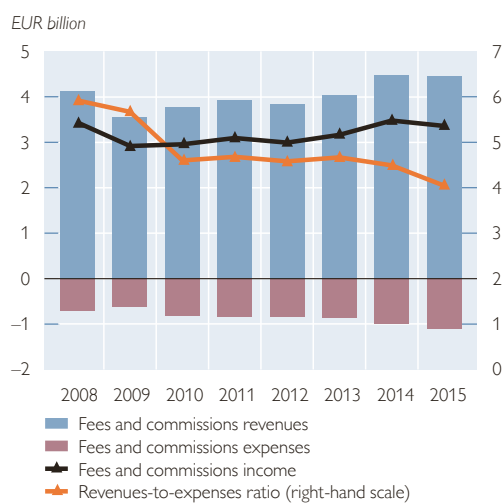
Fees and commissions income (FCI) has been the second-most important source of operating income for Austrian CESEE subsidiaries. It declined

significantly in the immediate aftermath of the GFC (–15% in 2009) as the related business activities (e.g. investment banking and asset management) dropped substantially in a risk-averse and uncertain economic environment, but grew slightly again thereafter (see chart 6). By 2015, FCI had nearly returned to its pre-crisis level of 2008.⁹ Consequently, FCI was unable to offset the decline in NII, which tallied up to –EUR 800 million from 2009 to 2015. This narrative changes, however, when switching the perspective to the recovery phase: From 2009 to 2013, the rise in FCI nearly balanced out the fall in NII, and from 2009 to 2015 (i.e. including the subsidiary in Turkey), FCI increased by more than EUR 440 million, thus more than offsetting the NII decline of over EUR 260 million.

To analyze the relative profitability of the fees and commissions business over the entire time period, we examine the ratio of fees and commissions revenue to its associated (direct) expenses.

Chart 6

Fees and commissions income



Source: OeNB.

Note: Data for all Austrian CESEE subsidiaries at year-end.

⁹ This development was helped by the reporting start of the subsidiary in Turkey in 2014. Please refer to footnote 5 for more details.

From this viewpoint, the costs incurred have resulted in less and less revenues over the past years: While the ratio stood at 5.9 in 2008, it declined to 4.0 in 2015 (with a particularly steep decline in Russia). Given that the associated rise in expenses (more than EUR 400 million) outpaced the increase in revenues (about EUR 330 million), the additional expenses were not put to profitable use. The picture changes again when excluding the exceptional crisis year of 2009 and studying the subsequent time period until 2015: Additional revenues of more than EUR 900 million and additional expenses of almost EUR 500 million again generated income, but the relative profitability of this incremental business – with a ratio of 1.9 – lay below that of the previous period.

It is difficult to predict whether the CESEE subsidiaries' future FCI would be able to compensate for a potential further decline in NII. On the one hand, FCI is a much smaller income

component than NII and faces threats from increased competition, especially if many banks were to crowd into this business line, and if commoditization and digitalization were to lead to margin pressures. On the other hand, banks that face profitability challenges in a low interest rate environment may be tempted to boost their income through a mix of raising fees and cross-selling new products to their clients, which may include an expansion of their product range to more FCI-based lines of business.

We now turn to operating expenses and the changes seen in their composition after the GFC, which will help us bring together the income and the cost side to analyze the operating profitability of Austrian banking subsidiaries in CESEE.

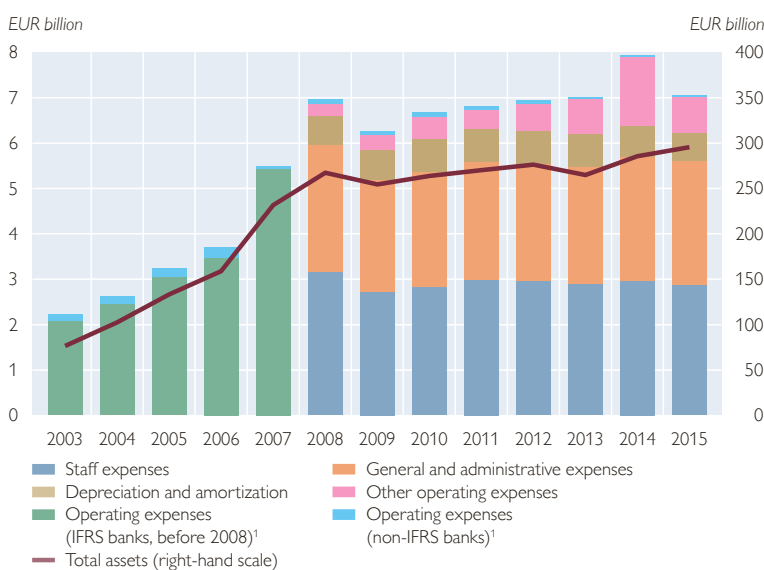
2 Operating expenses remained stable after the crisis, with one-off costs offsetting other efficiency improvements

Austrian banking subsidiaries' operating expenses in CESEE mainly consist of staff and other administrative expenses, which had a share of 41% and 39%, respectively, in 2015. When comparing 2008 and 2015 data, operating expenses increased only modestly (+EUR 90 million) as all components decreased except for other operating expenses, which rose sharply (see chart 7).

The strongest decline was registered for staff expenses (–EUR 288 million), which reflects reductions in personnel. After a strong expansion of Austrian banks in CESEE and a headcount peak at 143,000 in 2009, the number of employees was reduced to 129,000, with the largest declines registered in Ukraine (caused by the sale of a subsidiary and the geopolitical situation, among other things), followed by Romania (i.a. due to the sale of a sub-

Chart 7

Operating expenses of Austrian banks' subsidiaries in CESEE



¹ For the period 2003-2007 a decomposition of operating expenses is not possible. The same applies to data for non-IFRS banks for the whole period under review (i.e. 2003-2015).

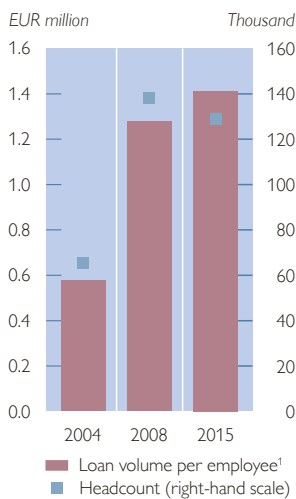
Source: OeNB.

sidiary) and Hungary. This reduction in staff numbers also helped raise the loan volume per employee between 2008 and 2015, which indicates an efficiency improvement (see chart 8).¹⁰

Unfortunately, the positive influence of enhanced staff efficiency at Austrian banking subsidiaries in CESEE was more than outweighed by an increase in other operating expenses (+ EUR 531 million or +207%) in the period from 2008 to 2015. Part of this sharp rise in other operating expenses, which peaked at EUR 1.5 billion in 2014, was due to legislative measures in several CESEE countries, e.g. measures to curb foreign currency loans in Hungary (2014) and in Croatia (2015), local bank levies as well as changes in business structure (e.g. sales of subsidiaries).¹¹

Chart 8

Staff-related figures at CESEE subsidiaries



¹ Loan volume before risk provisioning.

Source: OeNB

Declining operating income was responsible for (slightly) weaker operating efficiency

The cost-income ratio (CIR) is an indicator to gauge operating efficiency. The CIR of Austrian banking subsidiaries in CESEE improved from 62% in 2003 to 47% in 2009 (its lowest and thus best value over the period under review) before climbing back to 54% in 2015. The main factor behind this slight efficiency loss in the aftermath of the GFC was a decline in operating income and a modest increase in operating expenses (as described above and in chart 9). This suggests that it was the comparatively lower revenue generation – rather than ineffective operating cost control – that negatively affected operating profits in recent years. Compared to Austrian banks' domestic business or the EU average (CIR at 66% and 63%¹², respectively in 2015), this cost-income ratio is still rather favorable. It has to continuously prove its sustainability, though, as Austrian CESEE subsidiaries are still facing a challenging operating environment that is often characterized by heightened economic and macrofinancial risks. Furthermore, a certain number of tasks (headquarters functions) are performed by the parent banks for their foreign subsidiaries, which leads to a downward bias in operating costs at the subsidiary level. Therefore, further efficiency enhancements may be needed to contain costs at the currently moderate level.

Operating expenses are by far not the only cost item on banks' profit and

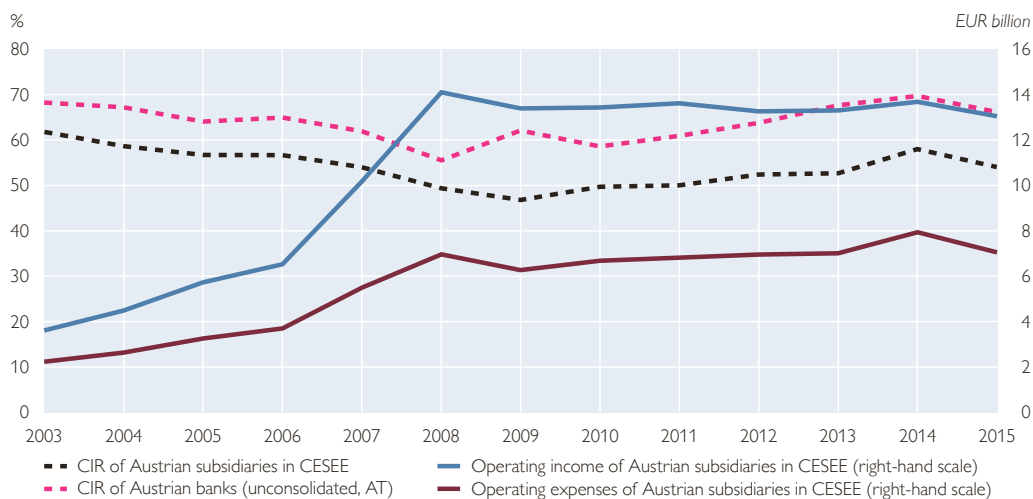
¹⁰ It should be noted that the number of employees as well as the loan volume per employee also depend on the subsidiaries' business model, i.e. those with a stronger focus on corporate business typically employ less personnel (as they have fewer retail branches) and display larger loan volumes per employee (also due to higher single loan volumes).

¹¹ No general statement can be made regarding the influence of legislative measures on other operating expenses or the categorization of these expenses in the supervisory reporting data, as some banks assign these costs to other operating expenses, whereas others book them as credit risk provisions.

¹² Source: ECB.

Chart 9

Cost-income ratio (CIR)



Source: OeNB.

loss statement. Therefore, the following two sections will address costs related to credit risk, writedowns on book value and (potential further) losses due to legislation on foreign currency loans, which will allow us to analyze the entire cost structure of the Austrian banking subsidiaries' CESEE activities.

3 Credit risk remains high in several countries, but its coverage has improved

Before the GFC, the loan loss provision ratio at Austrian banking subsidiaries in CESEE had decreased to 3% (end-2008). Due to the considerable deterioration of credit quality over the crisis years, this ratio rose sharply and peaked at 8% in September 2013, exerting strong negative pressure on the subsidiaries' profitability. Since then, aggregate credit risks have abated, and the ratio improved steadily to 7% in 2015. As a mitigating factor, the coverage ra-

tio for nonperforming loans (NPLs) has also improved over recent years. Nevertheless, the still elevated level of NPLs at some Austrian CESEE subsidiaries continues to be a major challenge, with adverse effects on their lending behavior.

In terms of the impact that heightened provisioning levels have had on profitability, the ratio of risk provisioning to operating profit stood at an elevated 68% in 2009, and slightly more than one-half of operating profits were still consumed by provisioning needs in 2015.¹³ The following paragraphs are dedicated to a more granular analysis of the underlying development of NPLs, their influencing factors and their coverage, which will allow us to gain a more detailed picture of the credit risk situation at Austrian banking subsidiaries in CESEE.

The NPL ratios of the CESEE subsidiaries of Austria's major credit institutions¹⁴ have shown a similar pattern

¹³ The year 2014 was exceptional in this respect, as the ratio reached 71% due to high risk provisioning needs as well as low operating profits in some countries (e.g. Romania, Hungary, Russia and Ukraine).

¹⁴ The Austrian credit institutions active in CESEE in the period under observation are UniCredit Bank Austria AG, Erste Group Bank AG, Raiffeisen Bank International AG, Hypo Alpe-Adria-Bank International AG, Volksbank Wien AG, Sberbank Europe AG and BAWAG P.S.K. The total assets of these credit institutions' subsidiaries correspond to nearly all total assets of Austrian banking subsidiaries in CESEE.

since 2009: They increased markedly in the first years of the GFC, peaked in June 2012 at an overall NPL ratio of 15% and then declined.¹⁵ This recent decline can be attributed to various measures taken by the banks, including efforts to restructure or sell NPLs¹⁶ as well as the disposal of entire subsidiaries. Also, local governments, supervisors and international stakeholders (e.g. in the Vienna Initiative¹⁷) have supported the orderly resolution of NPLs in CESEE. These recent improvements, however, did not compensate for the deterioration in overall credit quality, as NPL ratios in many host countries are still markedly higher than at the beginning of the GFC (see chart 10).

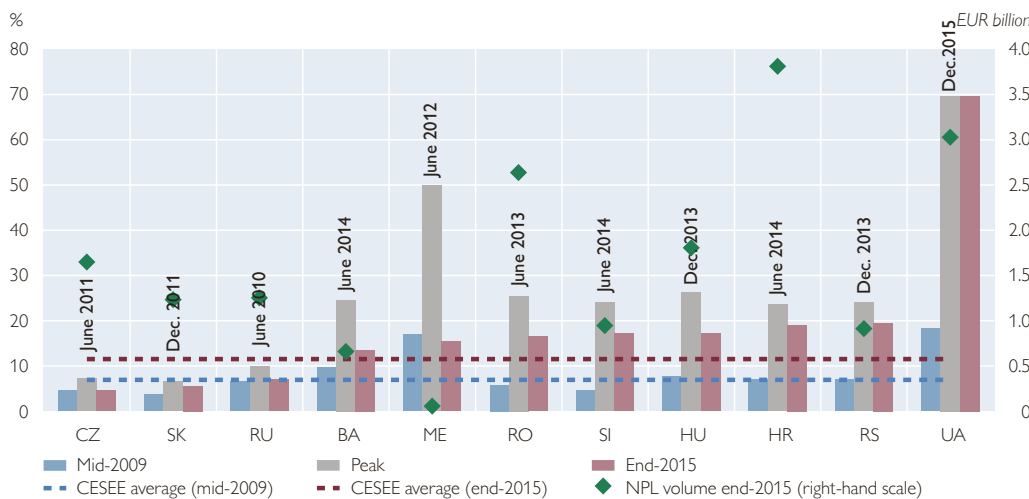
Cross-country differences in NPL ratios are high, reflecting heterogeneous economic and foreign exchange devel-

opments in the aftermath of the GFC: While the aggregate NPL ratio of Austrian subsidiaries remained below 10% in the Czech Republic, Slovakia and Russia, it was close to 20% in Hungary, Croatia and Serbia and reached nearly 70% in Ukraine at end-2015. Also, in most CESEE countries, loans to non-financial corporations performed worse than loans to households, with NPL ratios of 13% and 9%, respectively, at end-2015. The highest NPL ratios were observed in the building and construction industry (29% at end-2015), followed by accommodation and food service activities (18%), construction (17%) and wholesale and retail trade (14%).¹⁸

The currency composition of the subsidiaries' loan portfolio is another important factor influencing credit quality, and the NPL ratio of foreign

Chart 10

NPL ratios have declined recently, but levels are still elevated in several countries



Source: OeNB.

Note: Data for selected countries. The indicated date shows the peak NPL ratio.

¹⁵ Data are only available from 2009. Therefore the NPL analysis only covers the period 2009 to 2015. Only countries with at least two subsidiaries of Austrian credit institutions are shown in the charts.

¹⁶ For instance, the ratio improved when the majority of the NPL portfolio of Hypo Alpe Adria was shifted to the bad bank, HETA Asset Resolution AG.

¹⁷ The Vienna Initiative was launched in January 2009 as a framework for safeguarding the financial stability of emerging Europe and brought together all relevant public and private sector stakeholders of EU-based cross-border banks active in the region. For more details, please refer to npl.vienna-initiative.com.

¹⁸ These figures also include direct cross-border lending by Austrian banks to CESEE.

currency (FX) loans is higher than that of loans extended in a domestic currency (16% and 12%, respectively, at end-2015). Given that this issue has gained systemic importance in some host countries, it has been aggressively tackled, leading to increased operating expenses (see above) but also to a significant reduction in the volume of nonperforming FX loans, especially in Croatia and Hungary.

While the NPL stock often remains high, the associated risk has been mitigated via higher provisioning: The coverage ratio¹⁹ has increased considerably in most countries since end-2009 when it stood at 44%. With an average of 59% as of end-2015, it also compares favorably to the EU average of 44%.²⁰ It is also worth noting that the coverage of nonperforming FX loans has im-

proved recently due to measures in some host countries (see above) and the respective gap to the coverage of domestic currency loans has nearly been closed since mid-2014.

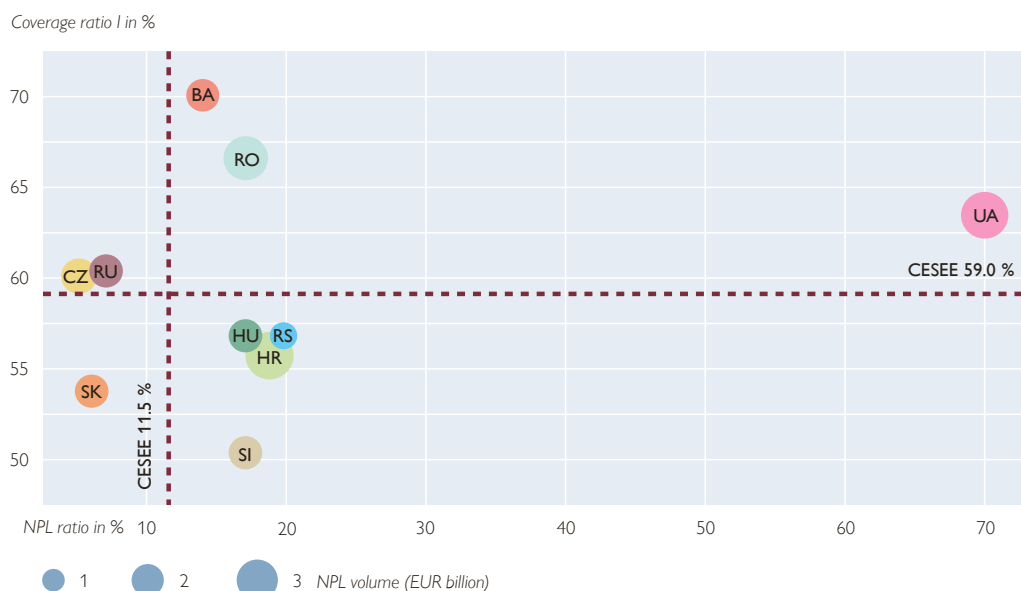
Nevertheless, coverage ratios in some countries with high NPL volumes and ratios are still below average. This is the case in Croatia (56%), Serbia (57%) and Hungary (57%) (see chart 11), which calls for particular attention to NPL resolution and/or provisioning in these countries.

Rapid credit growth led to high NPL ratios, which now weigh on the ability to lend

Rapid credit growth is often considered to be a driver of subsequent (high) NPL ratios.²¹ Data of Austrian banking subsidiaries in CESEE confirm this posi-

Chart 11

NPL and coverage ratio of Austrian banking subsidiaries in CESEE (end-2015)



Source: OeNB.

Note: The size of the bubbles corresponds to the NPL volume in EUR billion.

¹⁹ Loan loss provisions for NPLs relative to NPL volumes.

²⁰ Source: EBA (2015). The risk dashboard is based on a sample of risk indicators from 194 European banks.

²¹ "The effect of past excess lending is also captured by the lagged lending growth, which results in higher NPLs as well." (Klein, 2013, p. 12) and "excessive risk-taking (measured by loans-to-assets ratio and the growth rate of bank's loans) was found to contribute to higher NPLs in the subsequent periods." (Klein, 2013, p. 20).

tive relationship: As shown in the left-hand panel of chart 12, banking subsidiaries with currently high NPL ratios reported higher annual loan growth in the pre-crisis period (2005–2008) than banks with lower NPL ratios.²²

Furthermore, the still elevated level of NPLs reported by some subsidiaries seems to adversely affect their lending behavior: The right-hand panel of chart 12 shows that NPL ratios exhibit a negative correlation with lending growth, i.e. subsidiaries with higher NPL ratios tend to lend less.²³ While subsidiaries with NPL ratios below 5% (as of end-2014) posted weighted average loan growth rates of +6% in 2015, those with NPL ratios above 20% reported negative rates (–11%). This highlights the macroeconomic importance of reducing the stock of NPLs to support

credit growth and thereby the recovery in CESEE countries.

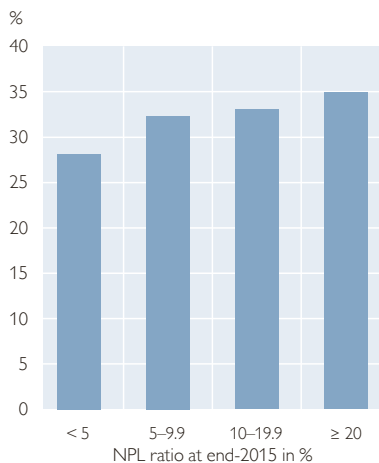
4 Writedowns of subsidiaries' book values and forced conversion of foreign currency loans led to substantial costs

So far we have analyzed Austrian banks' profitability in CESEE solely on the basis of income and expense data for their CESEE subsidiaries (at the sub-consolidated level) and in terms of standardized profit and loss positions. In this section, we aim to complement and extend this analysis by first taking into account writedowns of the subsidiaries' book values and then highlighting (potential) losses due to forced FX loan conversions, which will provide a more comprehensive view of the overall profitability of the Austrian banking business in CESEE.

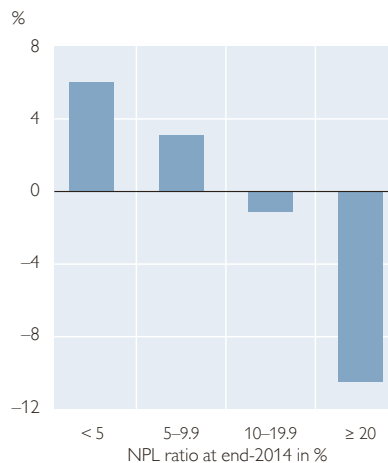
Chart 12

NPL ratios and lending growth¹

Average annual net lending growth (end-2004 to end-2008)



Gross lending growth in 2015



Source: OeNB.

¹ Lending to nonbanks.

²² A positive correlation (significant at the 5% level) was found between loan growth during the pre-crisis period and the subsequent NPL ratios at end-2015.

²³ Loan growth can be attributed to both supply and demand factors, and while this analysis focuses on supply effects, loan demand can also be assumed to be negatively affected by high NPL ratios (weak creditworthiness of borrowers and/or difficult general economic conditions). Note that a correlation (significant at the 1% level) was found between high NPL ratios and weak loan growth.

Between 2004 and 2015, Austrian banks held direct and indirect stakes in 90 banking subsidiaries domiciled in CESEE, with the highest number of holdings reported in 2007 (73 banks) and stakes in 59 subsidiaries at the end of 2015.²⁴ The book value of these CESEE subsidiaries peaked at EUR 32 billion between 2008 and 2010; EUR 8 billion – or one-quarter – was written down by the end of 2015 (see chart 13). High book values and writedowns mainly resulted from acquisitions in just a few countries (Croatia, the Czech Republic, Kazakhstan, Romania and Russia), and banks mostly kept these subsidiaries (with the exception of Kazakhstan). Given that these writedowns were made on the consolidated balance

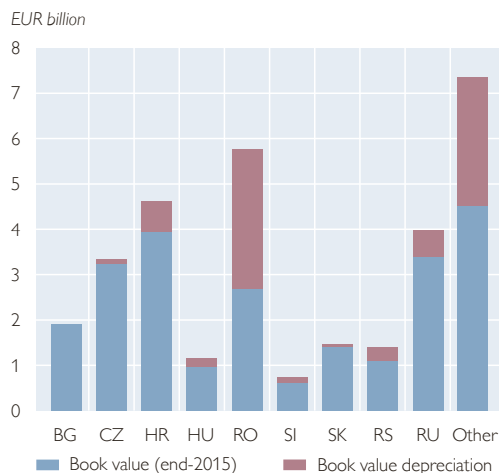
sheets of the Austrian parent banks and not on the balance sheets of the foreign subsidiaries, the profitability of activities in CESEE is usually overestimated considerably (especially with regard to the EUR 25 billion in subsidiaries' profits noted in the introduction for the period 2003–2015).²⁵

We now turn to the calculation of the costs arising from national legal measures regarding the forced conversion of FX loans, which has been another important (extraordinary) cost factor in recent years. Additionally, we attempt to estimate the remaining future cost potential. It is worth noting that these calculations only include the cost of mandatory FX loans conversions and do not take into consideration the standard risks usually linked to FX loans, e.g. exchange rate volatility or the (often related) ability of borrowers to service their debt.

Up until now, mandatory conversions of FX loans in CESEE were limited to FX loans to households, which peaked in mid-2012 and have declined substantially since then (by nearly 40% until end-2015), even though the reduction

Chart 13

Austrian banks' book value of CESEE subsidiaries



Source: OeNB.

Note: Book value depreciation refers to the difference between the maximum book value and the book value at end-2015. "Other" includes Albania, Belarus, Bosnia and Herzegovina, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, the former Yugoslav Republic of Macedonia, Montenegro, Poland, Turkey and Ukraine.

Table 1

Foreign currency loans to households

	FX loans total	FX loans denominated in		
		EUR	CHF	USD
EUR billion				
June 2012	33.3	16.5	13.4	3.4
Share		50%	40%	10%
Dec. 2015	20.1	12.1	6.3	1.7
Share		60%	31%	8%

Source: OeNB.

²⁴ The quoted number of stakes relates solely to the analysis of the subsidiaries' book values in this section. In all other parts of the study, the analyzed data refer to the 93 Austrian banking subsidiaries in CESEE that existed at various points in time over the period under review. The number of subsidiaries was highest in the fourth quarter of 2007 and the first quarter of 2008 (73) and stood at 61 at the end of 2015. With the transfer of subsidiaries from UniCredit Bank Austria AG to its parent bank, UniCredit, this number shrank considerably in 2016.

²⁵ As mentioned above, another cost item not booked through the subsidiaries' profit and loss accounts are the expenses relating to headquarters functions executed by the holding.

was distributed unevenly across currencies (see table 1).

The actual costs Austrian banking subsidiaries incurred in the past as a result of mandatory FX loan conversions varied substantially: While they were negligible in Hungary (2014–15) with conversion rates at or close to market rates, they amounted to roughly EUR 0.6 billion or 30% of the affected amount outstanding in Croatia (2015). The action taken in Croatia was particularly interesting in that it affected only loans denominated in or linked to Swiss francs (CHF), and the loans were converted into euro and not into Croatia’s legal tender, the Croatian kuna.

It has to be noted that mandatory FX loan conversions are often motivated by reasons other than purely financial stability considerations and raise crucial questions concerning legal certainty and the principle of legitimate expectations. Therefore, any estimate of the terms of future FX loan conversions and the related costs for lenders is subject to a high level of uncertainty and therefore, frankly, close to impossible.

5 Summary: sustainability of net interest income remains crucial while various risk costs are being digested

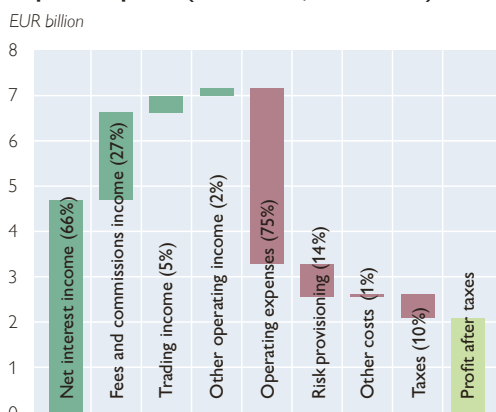
To conclude our study of the profitability of Austrian banking subsidiaries in CESEE and bring together all items analyzed, we use a revenue bridge to visualize the overall composition of income and costs over the entire time period from 2003 to 2015 (chart 14). Additionally, we look at the most recent full-year data for 2015 in a risk-return cluster analysis.

On the income side, the share of NII in total operating income increased slightly from an average of 66% (2003–2008) to 70% (2009–2015). In light of the pressure on interest margins in most CESEE countries and the lack of local organic growth, this large share raises questions regarding the sustainability of future profits at Austrian CESEE subsidiaries. This then highlights the importance of generating additional fees and commissions income, which is the other important source of operat-

Chart 14

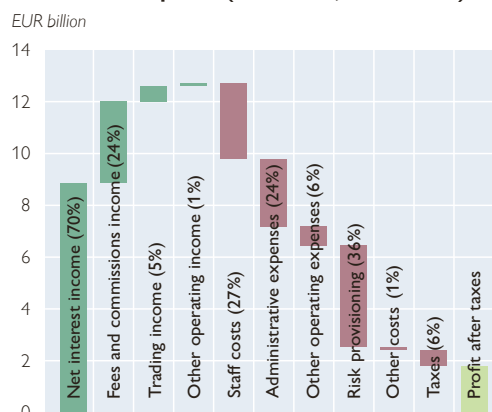
Accumulated profit and loss account of Austrian subsidiaries in CESEE

Expansion phase (2003–2008, annualized)



Source: OeNB.

Consolidation phase (2009–2015, annualized)



Note: Figures in brackets indicate the respective share in total income or total expenses/costs. No breakdown of operating expenses is available before 2009.

ing income: Due to the continuous financial integration and deepening of CESEE banking markets, banks could try to strengthen their noninterest-related business, e.g. by offering additional services, which would not only diversify their income base, but also help offset the negative effects of adverse interest margin developments. The next years will show whether this strategy will prove sufficiently profitable, especially if competition in this area was to increase and compress margins.

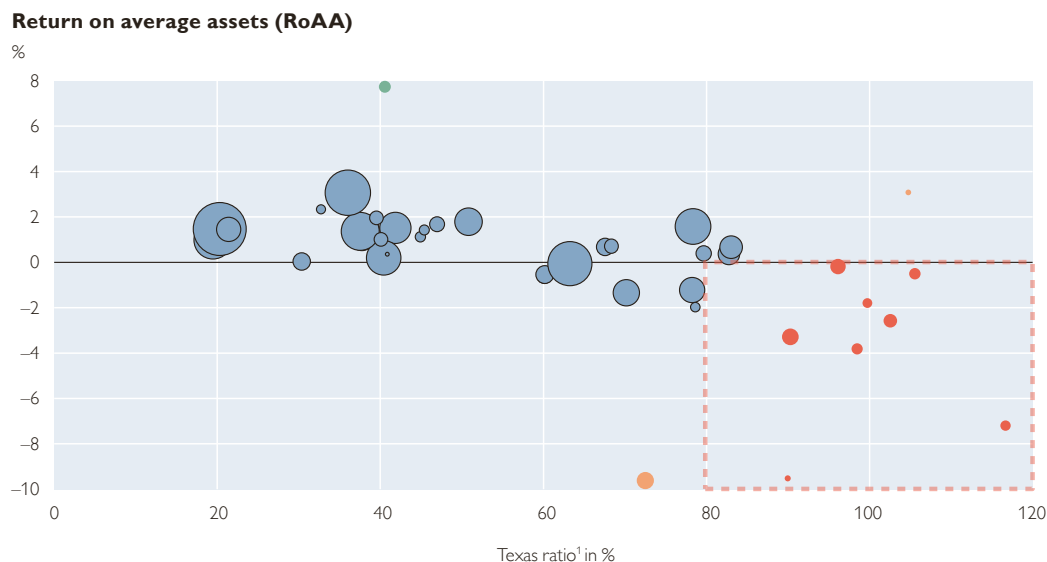
On the cost side, risk provisioning was of minor importance during the expansion phase, accounting on average for only 14% of all expenses. This share more than doubled to 36% in the consolidation phase. Risk provisioning has become the largest cost item in the profit and loss account of Austrian

banking subsidiaries in CESEE. Although provisions started to decrease from their 2013 peak, the subsidiaries should continue to strive for risk-adequately priced products and maintain their operating cost discipline to be able to absorb renewed credit losses should they occur.

At the end of this study, we extend our profitability focus to a brief risk-return analysis in order to cluster Austrian banking subsidiaries in CESEE according to their most recent profitability data (RoAA in 2015) and their credit risk-bearing capacity (Texas ratio²⁶ at end-2015). The data plotted in chart 15 show a significant relationship between both metrics, with less profitable subsidiaries also displaying weaker credit risk-bearing capacities (i.e. higher Texas ratios). It is also worth noting that larger subsidiaries tended to be

Chart 15

2015: Profitability (RoAA) versus credit risk-bearing capacity (Texas ratio)



²⁶ The Texas ratio allows to compare banks' realized credit risks (gross NPLs) to their provisions and capital, thereby providing a risk-bearing measure for nonperforming loans.

profitable and have better Texas ratios, while a few smaller subsidiaries posted losses and also displayed high Texas ratios above 80% (these subsidiaries' bubbles are marked in red). This latter group of subsidiaries calls for heightened attention: They would need to lower their net NPL volumes (e.g. by selling NPLs and/or increasing provisioning) and/or improve their capital levels in order to lower their Texas ratio to a more sustainable level. But at the same time, they were not profitable in 2015 and could therefore not easily afford further short-term costs or the organic generation of capital by retaining earnings.

This highlights that profitability is the first line of defense for Austrian banking subsidiaries in CESEE and that its sustainability is of utmost importance to the host markets' and Austria's financial stability. Substantial past prof-

its often went hand in hand with higher credit risk costs, book value write-downs and legal uncertainties. Future research regarding the adequacy of these profits – e.g. in terms of a comparison between the cost of and the return on equity – and a profitability decomposition in an adapted DuPont analysis could further complement this analysis.

Looking forward, net interest margins are likely to remain under pressure, organic growth is unlikely to play a sufficiently compensating role and an – albeit lowered – potential for extraordinary costs still remains. In this challenging environment, the improvement in credit quality and provisioning levels is a welcome trend. While banks should continue to proactively address the remaining legacy issues, strengthening the sustainability of the subsidiaries' profitability also requires persistent efforts.

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Banking employment in Austria

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The ongoing restructuring and consolidation process in the Austrian banking sector has drawn attention to banking employment developments. This article takes stock of the data on employment, labor costs and related indicators to provide a basis for discussion. Since 2008, the number of employees in banking has been on a slow, but permanent decline. Working hours have decreased even more strongly, reflecting a shift toward part-time work. Wage costs per employee are relatively high and have grown faster than those in most other sectors. However, until 2008, labor productivity growth outpaced labor cost growth. Since the crisis, labor cost growth has exceeded productivity increases, but less strongly than in the rest of the economy. Banks' intensity of IT use has increased over the past 15 years. Not all IT investments were intended to substitute labor with capital. Instead, increasing IT usage in banks went hand in hand with a significant shift toward higher-skilled labor. Moreover, organizational changes related to the ongoing consolidation processes within the Austrian banking sector have contributed to the reduction in labor demand. Until recently, banks appear to have avoided layoffs, relying on attrition instead.

JEL classification: E24, G21, J21

Keywords: banking, employment, labor costs, value added, Austria

The banking sector not only fulfills the essential economic function of financial intermediation but also plays an important role for the domestic labor market. Thus, analyzing both the structure and the development of banking sector employment in Austria can provide relevant insights into the extent of change in the role of banking in Austria in recent years – especially since the onset of the crisis. From a financial stability perspective, the issue of employment might be considered primarily a cost factor. But looking at employment is also relevant for understanding how banks fulfill their economic role and – in a wider context – for comprehending the development of Austria as a financial center.

Since the onset of the crisis we have witnessed a slow, but steady decrease of employment in Austrian banking. Moreover, many observers expect a further, possibly sharp decrease of the banking workforce in the coming years. In par-

ticular, the OeNB has pointed out repeatedly that the reduction in the number of people working in the Austrian banking sector in the past few years is likely to continue and might even gain momentum in the future (see, for example, OeNB, 2015). Many possible reasons support these expectations, among them relatively high labor costs and reduced profitability, cost pressures due to regulatory requirements and higher competition, technological change and the relatively high number of bank outlets.

This article takes stock of the data on employment in the Austrian banking sector to provide a suitable basis for discussing changes in employment. Seeking to condense the major trends, we have confined ourselves to looking at aggregate data for the banking sector as a whole and discuss neither heterogeneity within the banking sector nor developments at individual banks. Wherever possible, we focus on the period between the eve of

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the third stage of Economic and Monetary Union (EMU), i.e. end-1998, and 2015. We pay particular attention to the period since the onset of the crisis in 2008. To put developments in Austria into an international perspective, we provide some evidence that allows a comparison of Austria with other EU countries.

This paper is structured as follows: Section 1 shows the evolution of employment in banking in Austria by providing data on the number of people employed and on hours worked. We also shed some light on personal characteristics of employees, such as gender, age, tenure and educational attainment. Section 2 provides information on labor costs and productivity. Section 3 compares trends in employment in Austria with developments in other EU Member States. Section 4 discusses several factors affecting labor demand in banking. Section 5 summarizes and concludes.

1 The evolution of banking employment since the start of EMU

At the start, let us clarify what we mean by “employment” in “the Austrian banking sector.” We use a narrow definition of the banking sector wherever possible.² We define employment in banking as covering exclusively employees in banks operating in Austria.³ The data include only persons employed directly by banks, not persons em-

ployed by nonbank subsidiaries.⁴ In the same vein, we disregard employment of Austrian banks in subsidiaries abroad. Banking employees provided by staff leasing firms in banking are not included, either.⁵ For more information on the different data sources, see the data source annex.

1.1 Employment in banking on the decline since 2008

Panel (a) of chart 1 displays the number of persons employed in banking according to OeNB banking statistics (blue line). Between 1998 and the onset of the crisis in 2008, employment increased from 74,846 to 80,293 employees. Since then, a continuous decline to 75,034 (2015) has brought banking employment roughly back to the level of 1998. Against the background of positive employment growth in the economy as a whole, this decline implies a rather strongly decreasing employment share: In 2015, the share of banking employees in total employment (dashed black line) was less than 2%, down from 2.4% in 1998. As in the overall Austrian economy, the banking employment pattern to a considerable degree reflected cyclical factors. Panel (b) of the chart compares the growth rates of banking employment (blue line) and of the number of all employees in the total economy (black line). The dashed green line, representing real GDP growth,

² The one-digit NACE (ÖNACE 2008) section K (financial and insurance activities) is comprised of the two-digit division K64 (financial service activities, except insurance and pension funding), K65 (insurance, reinsurance and pension funding, except compulsory social security) and K66 (activities auxiliary to financial services and insurance activities). Whenever possible, we refer to K64. We use the broad section K only if, due to data limitations, no statistics exist for K64. The distinction is very significant: In 2014, according to national accounts data, there were 118,400 employees in NACE K, but only 76,800 employees in K64.

³ The scale of self-employment in banking is very low in Austria and most EU Member States. Social security data tell us that fewer than 800 self-employed persons were working in banking, i.e. accounting almost exactly for 1% of total employment. For example, salespersons of building societies are self-employed.

⁴ Employment figures in banking may be affected by outsourcing to subsidiaries: Former bank employees might then be classified in economic statistics as being employed in other sectors (such as IT services or real-estate agency services). See section 4.2 for more information on outsourcing.

⁵ According to the Austrian Federal Ministry of Labour, Social Affairs and Consumer Protection (BMASK), 653 leasing workers were employed in banking at the end of July 2013.

suggests that banking employment is correlated with the business cycle. Its cyclical correlation is significantly positive, but somewhat weaker than that of employment in the total economy.⁶ Furthermore, banking employment figures tend to co-move with total bank assets, which are represented by the dashed purple line in the chart. Bank employment grew faster than overall employment in only a few years prior to the crisis (2004 to 2006). Thereafter, the crisis left its mark on banking sector employment, so that from 2009 onward, the banking sector was unable to emulate the continuing growth of total employment.

However, headcount figures alone do not take into account the significant increase in part-time employment, as shown in panel (a) of chart 2: The bars

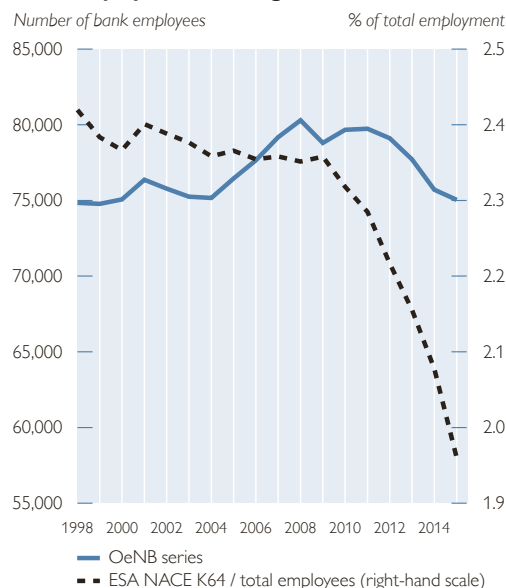
indicate that part-time work increased every year from 1999, whereas full-time jobs mainly grew in the years before the crisis. From 1999, the incidence of part-time work in banking (blue line) rose from 13% to almost 27% in 2015 (8.2% for men and 42.8% for women⁷). A comparison with the part-time share in the total economy (black line) suggests that the banking sector followed the trend toward more part-time work, albeit from lower levels. Furthermore, especially since 2013, the relatively steep increase in part-time work for both men and women is consistent with the sector's efforts to reduce personnel costs while avoiding layoffs (see chapter 4).

Total working time mirrored both the decline in the number of employees

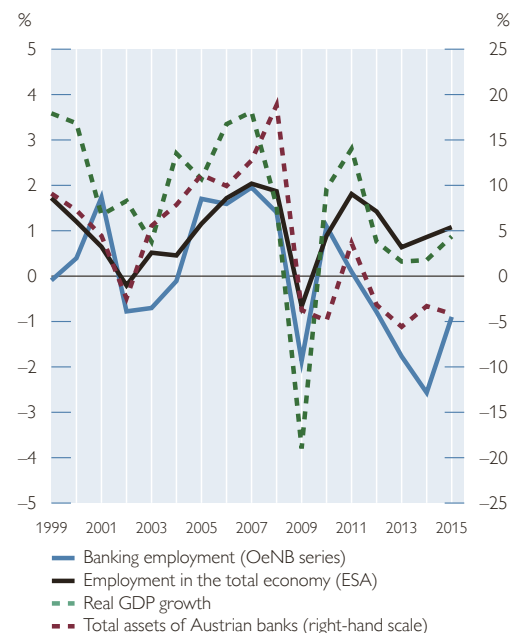
Chart 1

Banking employment in Austria since the start of EMU

(a) Change in the number of employees in banking



(b) Growth of employment, GDP and bank total assets



Source: OeNB, Eurostat.

⁶ The contemporaneous Pearson correlation coefficient of total employment with GDP growth for 1998 to 2014 (annual data) is 0.71, whereas it is 0.64 for banking.

⁷ The share of female employees in banking has been stable in recent years, amounting to 52.4% in 2015, which is higher than in the economy as a whole (46.9%).

and the significant rise in the part-time ratio.⁸ Panel (b) of chart 2 compares the evolution of employment measured in persons (blue line, based on OeNB data, like in the previous chart) to working hours actually worked (national accounts data) and to full-time equivalents (FTEs). The evolution from 1998 to 2008 is somewhat unclear: Whereas national accounts data point to a steady increase in hours worked until the onset of the crisis, the FTE data decrease first before they start increasing in 2004. Since 2008, the data have consistently pointed to a decline in working time that was stronger than the fall of employment measured in persons. Put differently, the share of hours worked in banking continuously dropped from around 2.3% in 2008 to currently 2%.

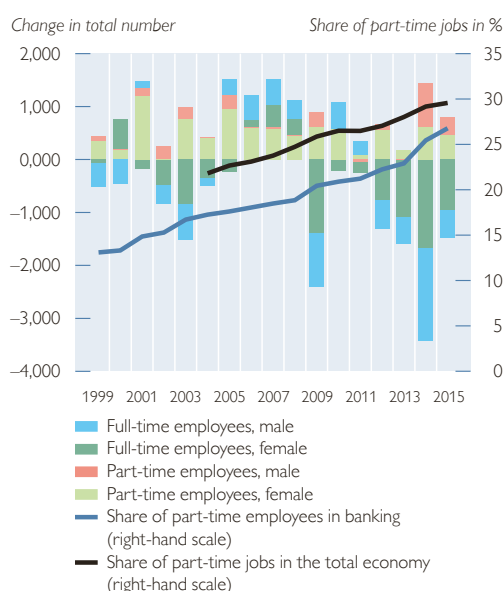
1.2 High job stability

Despite the decreasing number of bank employees, bank employment has so far been characterized by a high degree of stability. Bank employees tend to be with their current employer for a relatively long time. Chart 3 displays tenure categories for three broad sectors (industry, private services, public services) and for banking (NACE division K64) in three different years (2004, 2009, 2015). In banking, the share of new employees (tenure: less than one year) is lowest (which is consistent with low hiring) while its share of employees in the top tenure category (20 years or more) is highest (exceeding 30%), indicating high job stability. The chart also indicates that the share of employees in the highest tenure category has risen

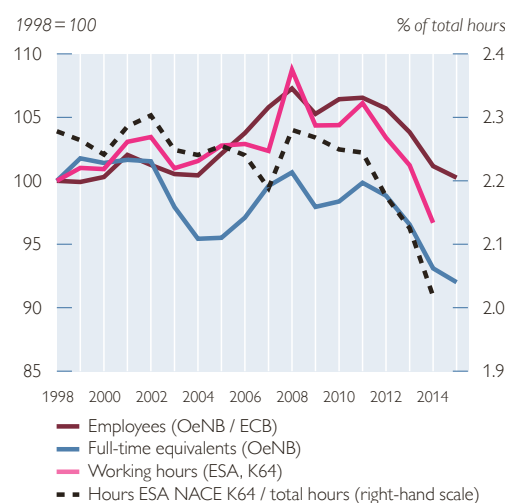
Chart 2

The evolution of working time since 1998

(a) Full-time and part-time jobs



(b) Persons, hours and full-time equivalents

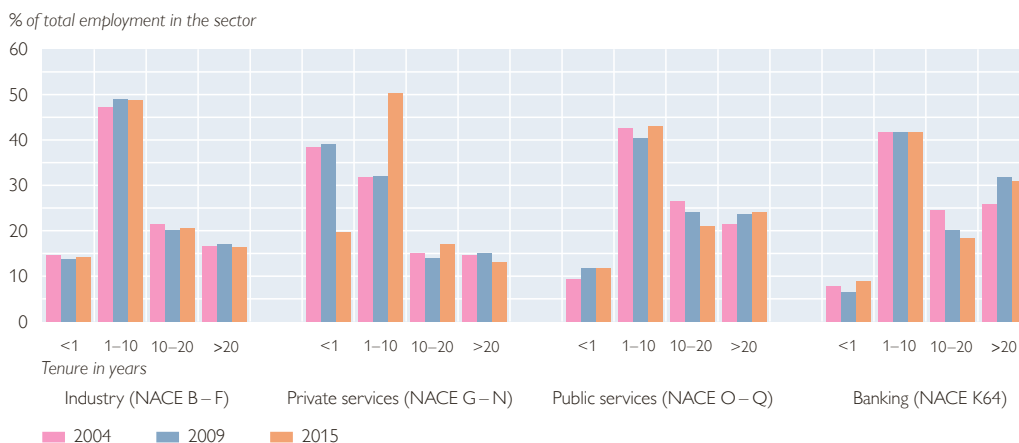


Source: OeNB, Eurostat.

Note: Part-time employment data include minor jobs.

⁸ The reduction in the number of employees and the increase in part-time jobs are probably not the only reasons why overall working time in banking has decreased. Working time also appears to have decreased in full-time jobs: According to the Labour Force Survey, the share of workers working overtime decreased from 37% in 2008 to 22% in 2015.

Tenure in banking in comparison to other sectors in selected years



Source: Statistics Austria (Labour Force Survey).

by about 10 percentage points over time.

Employees in banking are older on average than those in the total economy. The age gap has widened since the onset of the crisis, with the average age of banking employees rising faster than that of other employees between 2008 and 2015, bringing the average age of banking employees to 42.1 years in 2015 as compared to 39.7 years for other employees. Chart 4 displays the age distribution developments for male and female employees separately for 2008 and 2016. It shows that the age distribution in financial services was and remains concentrated at relatively higher ages than in the total economy.⁹ Between 2008 and 2016, the age distributions shifted to the right due to population ageing. Moreover, the number of employees aged 20 to 35 years fell more strongly in banking than in the economy as a whole.

As a result of the high job stability in banking, unemployment affects former bank employees comparatively rarely.

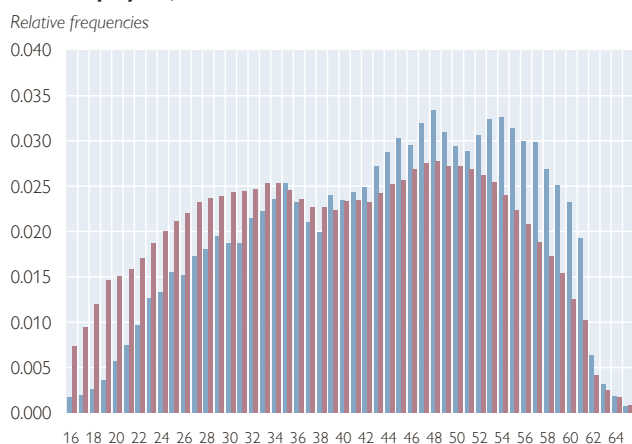
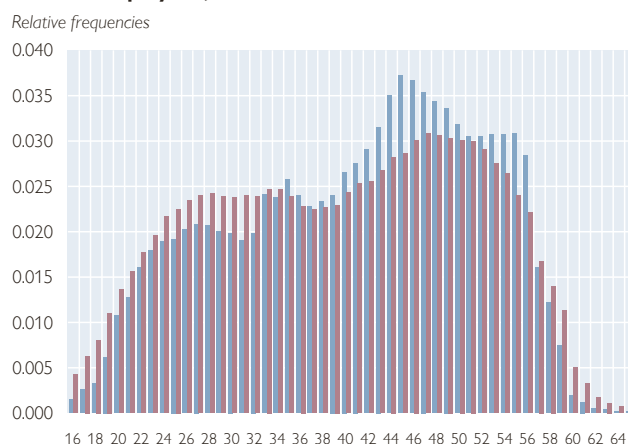
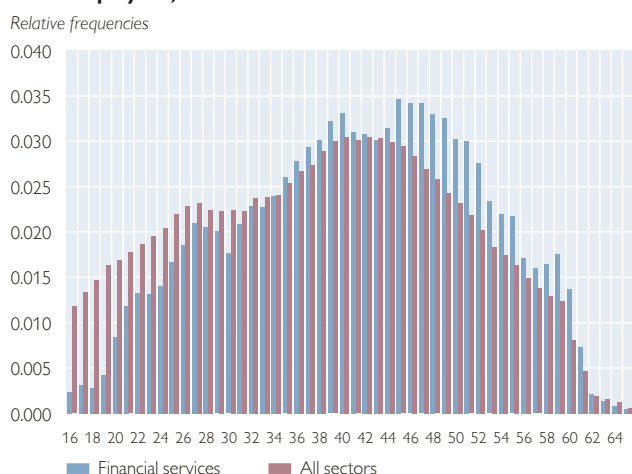
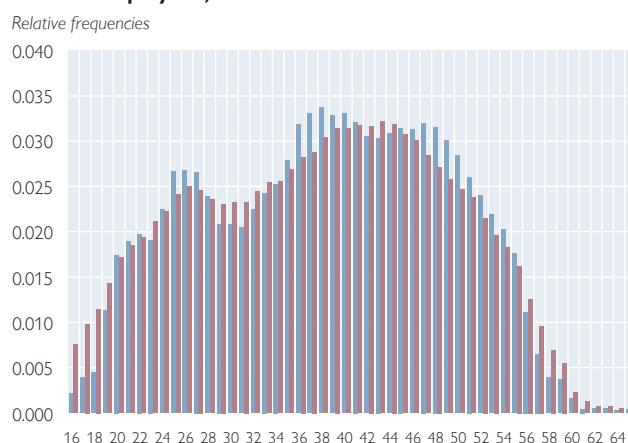
The Austrian public employment service (AMS) registers the number of unemployed and, additionally, those unemployed persons who are enrolled in training courses. The number of jobless persons who were previously employed in banking has risen since the crisis, widening from 1,157 in 2008 to 2,044 in 2015. These numbers imply that the unemployment rate in banking (including the number of persons in AMS schooling) increased from 1.4% to 2.6% between 2008 and 2015. Compared to the overall increase of the unemployment rate in the same period (from 7.2% to 10.6%), unemployment in banking is still very low.

1.3 Highly educated banking workforce

Employees in banking have higher educational attainment than the average employee: The share of employees that are graduates from higher secondary schools is very high, and the share of those with tertiary degrees is relatively

⁹ The age distribution data refer to the end of January 2008 and January 2016, respectively. The presented average age numbers include the (very small) number of employees who work(ed) beyond the age of 65 years; we disregard these employees in the chart.

Chart 4

Age distribution of employees in financial services in comparison to the total economy: 2016 vs. 2008**Male employees, 2016****Female employees, 2016****Male employees, 2008****Female employees, 2008**

Source: Austrian Ministry of Labour, Social Affairs and Consumer Protection.

Note: Data refer to K64 end of January of the respective years. Employees over the age of 65 are not included.

high and rising (chart 5).¹⁰ The shares of employees with an apprenticeship completion certificate or other lower secondary education are significant but shrinking, and very few employees have only a primary education.

Chart 6 shows the distribution of employment among occupational categories. Blue-collar workers (the three

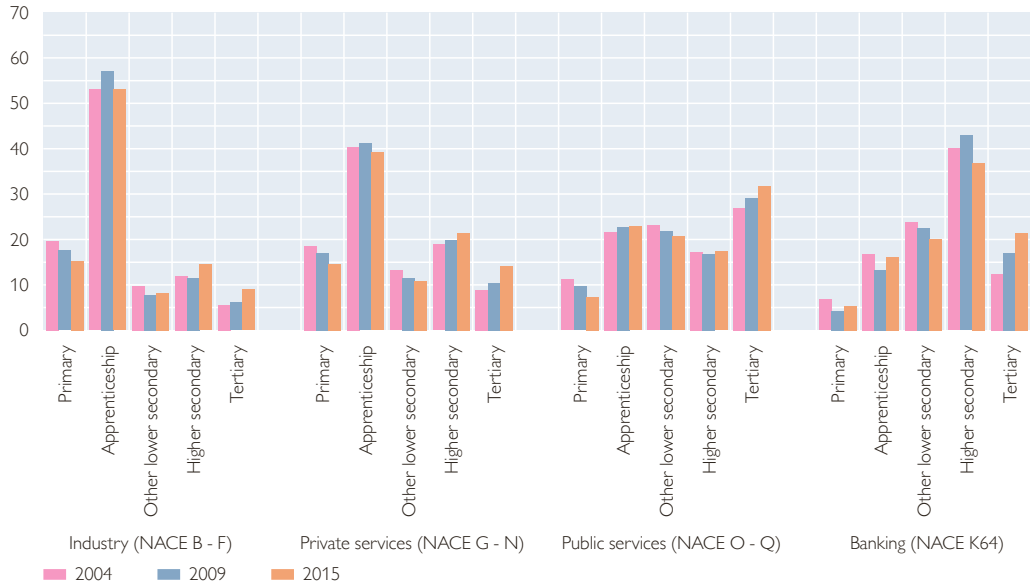
occupational groups on the right) play only a minor role in banking. The sector employs relatively many highly skilled workers, especially professionals, but also many technicians and associate professionals. Clerical support workers, who may be regarded as medium-skilled workers, constitute the largest group, currently 36%, in banking.

¹⁰ Philippon and Reshef (2007, 2013) hypothesized that by enabling a variety of financial innovations, the deregulation of financial markets increased the demand for labor in the financial sector, both in terms of quantity and even more in terms of quality, as more sophisticated financial products required more complex expertise and specialization.

Chart 5

Level of education of employees in banking in comparison to other sectors

% of all employees in the sector

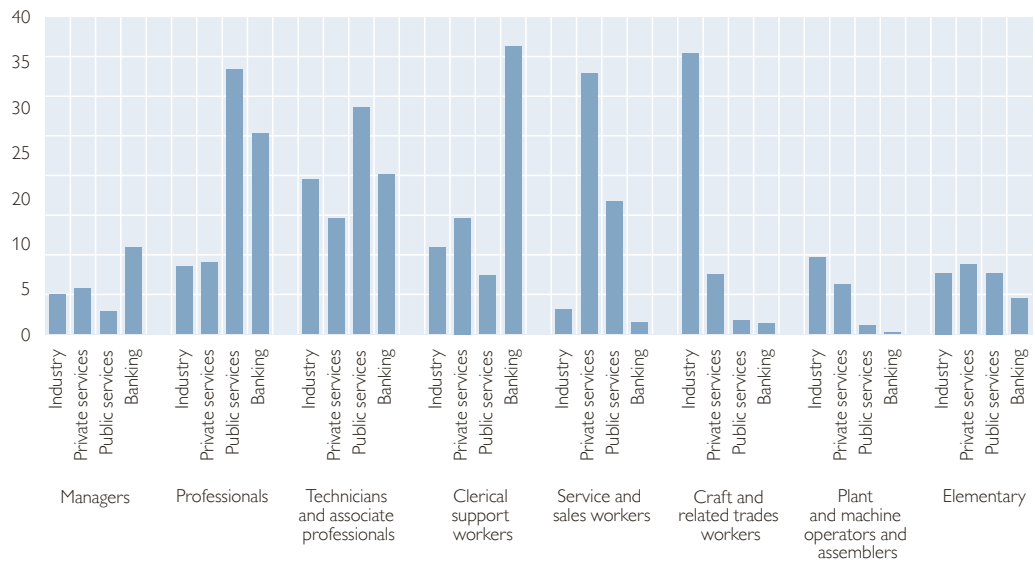


Source: Statistics Austria (Labour Force Survey).

Chart 6

Occupational groups in banking in comparison to other sectors (2015)

% of total employment in the sector



Source: Statistics Austria (Labour Force Survey).

Note: ISCO 08 classification (without ISCO 6).

Table 1

2 Labor costs and productivity

2.1 Banking has high labor costs ...

Compensation per employee (a measure of total labor costs) amounted to EUR 75,663 in 2014, whereas it was between EUR 40,000 and EUR 50,000 in industry, private services and public services. Hence, mean labor costs in banking were substantially higher than average throughout the period from the start of the third stage of EMU to 2015 (see the start of the first set of rows in table 1, nominal compensation per employee).¹¹ This is consistent with the predictions of human capital theory: As we have seen, banking employees (1) have higher educational attainment, (2) are older (they have greater overall work experience), and (3) have longer tenure (thus have more firm-specific human capital) than employees in other sectors.¹²

In the second set of rows (real compensation per employee at constant prices), table 1 reveals that mean real labor costs in banking rose more strongly than those in other sectors from 1998 to 2015. This holds for both the 1998 to 2008 period and the period after 2008, although real labor cost growth slowed down after the onset of the crisis, again reflecting the trend toward higher educational levels and ages.

Panel (a) of chart 7 displays the growth rates of compensation per employee in banking in comparison to those in the total economy. Wage cost growth was clearly higher than in the rest of the economy, with particularly strong hikes in 2006 and 2013.¹³ Panel (b) shows the evolution of collectively agreed

Labor costs in banking compared to broad sectors

	Industry (NACE B–F)	Private services (NACE G–N)	Public services (NACE O–Q)	Banking (NACE K64)
Nominal compensation per employee (EUR thousand)				
1998	32.7	28.3	33.4	47.2
2008	42.1	35.8	41.1	65.1
2014	47.9	40.5	44.9	75.7
<i>Average annual growth rates</i>				
1998–2014	2.4%	2.3%	1.9%	3.0%
1998–2008	2.6%	2.4%	2.1%	3.3%
2008–2014	2.2%	2.1%	1.5%	2.5%
Real compensation per employee (EUR thousand, at constant 2010 prices)				
1998	39.4	34.1	40.3	56.9
2008	43.4	36.9	42.4	67.1
2014	44.8	37.9	42.0	70.8
<i>Average annual growth rates</i>				
1998–2014	0.8%	0.7%	0.3%	1.4%
1998–2008	1.0%	0.8%	0.5%	1.7%
2008–2014	0.5%	0.4%	–0.2%	0.9%
Real value added per employee (EUR thousand, at constant 2010 prices)				
1998	66.8	73.9	..	61.3
2008	86.7	82.3	..	97.5
2014	85.1	80.5	..	100.9
<i>Average annual growth rates</i>				
1998–2014	1.5%	0.5%	..	3.2%
1998–2008	2.6%	1.1%	..	4.8%
2008–2014	–0.3%	–0.4%	..	0.6%
Real value added per hour worked (EUR thousand, at constant 2010 prices)				
1998	39.5	44.3	..	39.1
2008	51.8	50.5	..	62.1
2014	52.6	52.1	..	67.0
<i>Average annual growth rates</i>				
1998–2014	1.8%	1.0%	..	3.4%
1998–2008	2.7%	1.3%	..	4.7%
2008–2014	0.3%	0.5%	..	1.3%
Nominal unit labor costs				
1998	0.49	0.38	..	0.77
2008	0.49	0.44	..	0.67
2014	0.56	0.50	..	0.75
<i>Average annual growth rates</i>				
1998–2014	0.9%	1.7%	..	–0.2%
1998–2008	–0.1%	1.3%	..	–1.4%
2008–2014	2.5%	2.4%	..	2.0%

Source: Eurostat, authors' calculations.

Note: Price index: GDP deflator.

¹¹ Differences in working time are not a major reason for the difference: In 2014, total hours worked in financial services amounted to 1,506. The number for the total economy was 1,550.

¹² Pay schemes in banks also tend to be strongly age-related. For example, the collective agreement in banking (joint-stock and private banks) has nine tenure brackets in each of the seven occupational groups (from persons performing simple routine tasks up to managers or experts specialized on complex tasks). According to this agreement, bank employees can expect their salary to rise over the course of 20 years even if they are not promoted to a higher occupational level.

¹³ These hikes, especially the one in 2013, are probably related to staff restructuring, resulting in "golden handshakes" and similar employment termination payments (see section 4.3).

minimum wages, as measured by the index of agreed minimum wages (“Tariflohnindex”). Collectively agreed minimum wages are relevant for two reasons: First, they set minimum pay levels for different occupations and tenure classes in banking. Second, the annual increases of minimum pay are often used to adjust the *actual* pay levels every year.

Panel (b) indicates that the high growth of actual labor costs was not caused by particularly large increases of collectively agreed wages. Increases of collective pay in banking¹⁴ were mostly very similar to those of the total economy. From 2001 to 2009, collectively agreed wages in banking mostly rose somewhat more strongly than those in the private sector. After 2010, increases in collectively bargained wages were

consistently lower in banking than in the private sector, probably reflecting cost pressures in the wake of the Austrian banking sector’s problems and the resulting deterioration of unions’ bargaining position. Comparing the development of actual labor costs and collectively agreed minimum wages suggests that labor costs were mainly driven by structural factors within the banking workforce.

2.2 ... but also high labor productivity

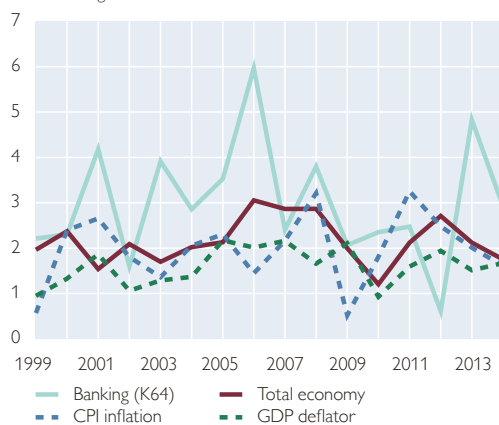
High earnings levels such as those in banking need not necessarily constitute a cost problem. What matters is the relation of labor costs to productivity, i. e. unit labor costs (ULC). In other words, ULC measure by how much labor cost growth exceeds productivity gains.

Chart 7

Wage growth in banking and in the total economy

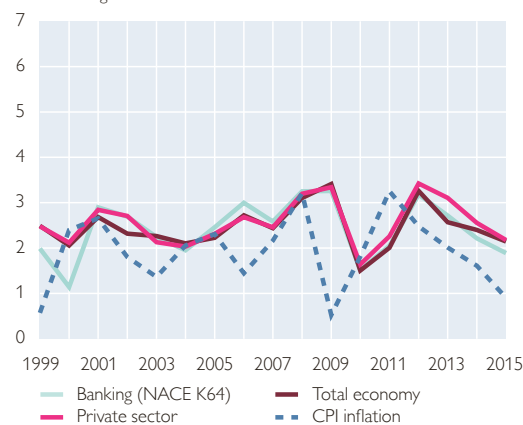
(a) Compensation per employee

Annual change in %



(b) Agreed minimum wages

Annual change in %



Source: Eurostat (national accounts), Statistics Austria, authors' calculations.

¹⁴ The index of agreed minimum wages (“Tariflohnindex”) for NACE K64 is available only for the years after 2006 (index 2006). For the wage increases up to that year, we use a weighted average (index weights) of the five relevant single series that are subcomponents of the index 1986 (joint-stock and private banks, savings banks, agricultural credit cooperatives, industrial credit cooperatives, Austrian Postal Savings Bank).

Real gross value added¹⁵ per banking employee showed above-average growth rates¹⁶ especially in the period before the crisis.¹⁷ After the crisis, growth slowed down markedly, but remained well above average output growth in the other sectors (the third set of rows in table 1, real value added per employee).

Productivity in banking was also above average when measured as output per hour worked. Real value added per hour rose from EUR 39 in 1998 to EUR 67 in 2014. Thus, the banking sector's labor productivity is higher than that of the overall economy (70% in 2014). This spread widened until 2009 and narrowed somewhat thereafter. On balance, labor productivity growth in the banking sector surpassed the output gains in industry and in private services both before and after the crisis (the fourth set of rows in table 1, real value added per hour worked).

The last set of rows in table 1 displays ULC figures. In contrast to the other sectors, banking exhibited clearly nega-

tive ULC growth from 1998 to 2008, which means that the relatively high growth of labor costs in this period was surpassed by even higher productivity gains. After 2008, the growth of compensation per employee in banking was somewhat stronger than productivity growth, leading to positive ULC growth rates (2% a year on average). But ULC growth was still relatively low in banking compared to that in other sectors.

3 Banking employment in an international perspective

To put the Austrian situation in perspective, the development of banking employment in a number of European countries, based on employment data from the ECB and working time data from Eurostat, is shown in chart 8.¹⁸ The data are shown as an index; the year in which the respective time series had its maximum in the period under consideration is chosen as the base year. In countries like Germany, the Netherlands and Belgium, the reduction in the

¹⁵ Without exploring the issues surrounding the measurement of banks' contributions to GDP, it has to be kept in mind that national accounts do not take into account the risk associated with lending activities. Thus, an increase in banking sector value added may simply be the result of additional risk taken by the banks. Therefore, as far as these pre-crisis income gains in the banking sector reflected increased risk-taking and not a growing market for banking products, they proved to be only temporary. See Basu et al. (2011) and Haldane et al. (2010), who estimate for the U.S.A. and the U.K., respectively, that adjusting for risk would reduce the measured output of the financial sector substantially. Moreover, in national accounts, the value of bank lending and deposit-taking services (for which no explicit charges are levied) are estimated by the so-called FISIM (Financial Intermediation Services Indirectly Measured), supposing that these services are paid for as part of the margin between rates applied to savers and borrowers. However, the FISIM cannot be deflated by means of a price deflator. Rather, the stocks of loans and deposits on which interest margins are based are revalued using a general price index (such as the GDP deflator, the deflator of domestic final demand, and the overall CPI; see Eurostat, 2001). Therefore, developments in the deflator for value added in the banking sector to a large extent reflect developments in the overall price level.

¹⁶ We disregard public services here because value added in the public sector is difficult to measure. Thus, in national accounts, net value added is simply equated with compensation of employees.

¹⁷ Real value added is nominal gross value added (defined as the value of gross output less the value of its intermediate consumption), deflated by the price index (implicit deflator). It refers to a given territory. Therefore, transferred profits stemming from production in foreign countries (e. g. from subsidiaries of Austrian banks in Central and Eastern Europe) do not affect Austrian gross value added. In the period between 2004 and 2009, real value added even grew by 7.4% a year.

¹⁸ As no data are available for the number of hours worked in the banking sector (K64) for many countries, data for the whole financial sector (banking and insurance; NACE K) are displayed in addition. In the countries for which both time series are available, the data move very much in tandem, so the trend – if not the absolute number – for the financial sector as a whole is likely to provide an approximate indication of the development in the banking sector.

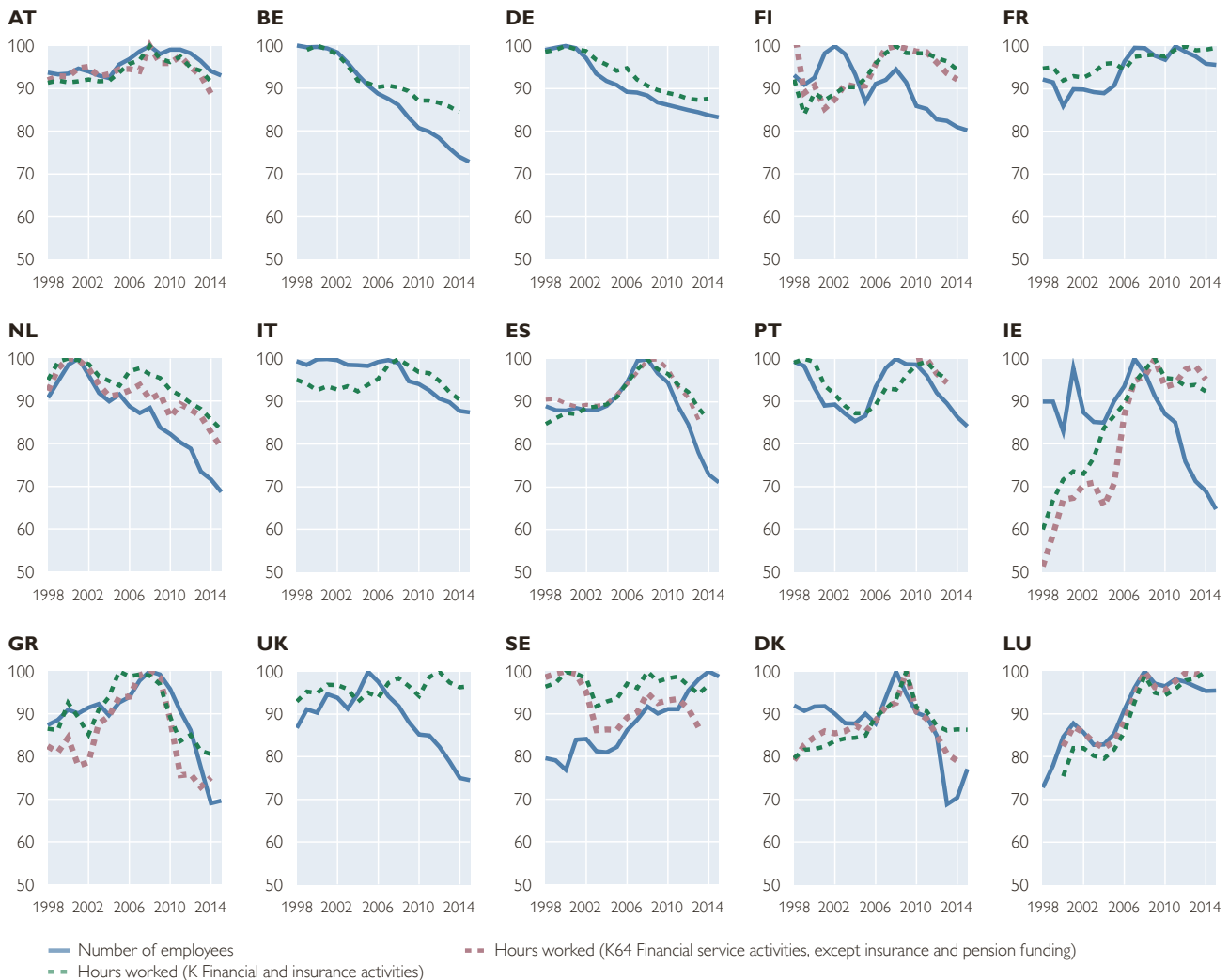
number of employees already started at the turn of the millennium. The effect of the crisis is highlighted by the fact that between 2008 and 2015, the number of employees declined by about 7% in the core EMU countries, whereas the decline reached more than 20% in the countries more directly affected by the crisis. In Austria, together with France and Sweden, the number of bank employees as well as the number of hours worked in the financial sector was still close to its historical peak in 2015.

The 6.9% decline in bank employment in Austria since 2008 was moderate in an international perspective. Across the EU, the decrease since the crisis amounted to 395,000 employees or more than 12%. This difference between Austrian and international developments was all the more noticeable, as many other countries did not have the significant increase in bank employment in the run-up to the crisis that Austria experienced. Moreover, the expansion of Austrian banks in CESEE could actually

Chart 8

Number of employees and hours worked at banks

Index (100 = MAX [1998, 2015])



Source: ECB, Eurostat, authors' calculations.

have played a major role in delaying the general trend of reducing employees in banking, mainly because staff was needed for banks' operations in that region.

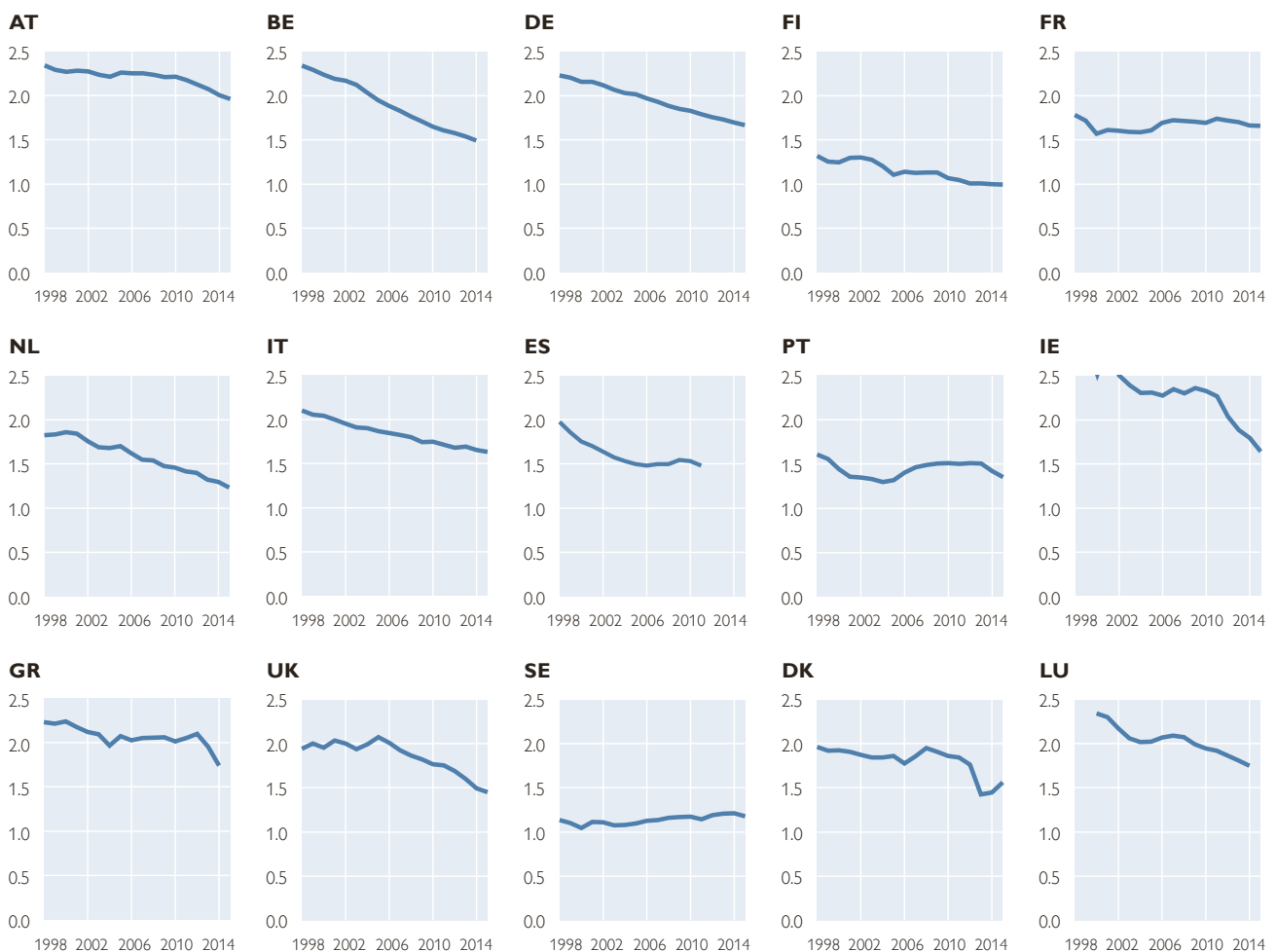
The share of part-time workers in the Austrian financial sector is comparably high. Labour Force Survey data indicate that in the whole EU, 13.9% of employees in the financial sector worked part-time in 2014, against 24.2% in Austria. Not only does this constitute one of the largest shares of part-time employees in the EU (only in the Netherlands was it higher at 31.7%), but this share also rose faster in Austria than in

most other European countries. Between 2008 and 2014, the share of part-timers increased by 6 percentage points in Austria compared to 1.7 percentage points in the euro area as a whole. Combining a moderate reduction in the number of employees and an above-average increase in the share of part-time employees implies that the reduction in hours worked was somewhat more pronounced in Austria than the decrease in the number of workers, although in an international comparison the reduction in hours worked was still quite low: During the whole period

Chart 9

Share of bank employees in total employment

%



Source: ECB, Eurostat, authors' calculations.

under review, the number of hours worked in the financial sector rose slightly between 2000 and 2013 (+0.3%) in Austria, whereas it fell by 2.4% in the euro area.

In 2015, Austria exhibited the second-highest share of bank employees in total employment among the countries presented; only Luxembourg showed a (considerably) higher share (see chart 9). The Austrian share is so large because Austria started into EMU with one of the highest ratios of the countries under review; moreover, the number of banking employees in Austria declined at a rate below the euro area average until the onset of the crisis. Since 2011, however, this relation has reversed, and the ratio has dropped faster in Austria. Obviously, not only the dynamics of the denominator (that is, bank employment) but also that of the numerator (total of employment) have played a role.

4 Possible drivers of labor demand in the banking sector

4.1 The role of technology

Advances in technology affect banks' labor demand through several avenues. On the one hand, technological changes may lead to the substitution of capital for labor. For example, automated teller machines (ATMs) and cash sorters have replaced tellers. Even more importantly, IT has simplified back-office administration and risk assessment considerably (Craig, 1997), and electronic banking has enabled banks to provide customer services with less manpower. IT-driven innovations may also entail greater economies of scale,

which in turn reduce the demand for labor (Berger, 2003). On the other hand, not all IT investments have led to a substitution of labor by capital. IT applications are complementary to complex tasks, thus increasing the demand for more highly skilled workers, while in routine activities, IT substitutes labor.¹⁹ Today, banking employees must be able to fulfill more tasks than their predecessors, from conducting a transaction to offering sophisticated financial advice. Thus, changes in job content prompted by technological change and the obsolescence of formerly relevant skills may generate a demand for new types of skills in banking employees.

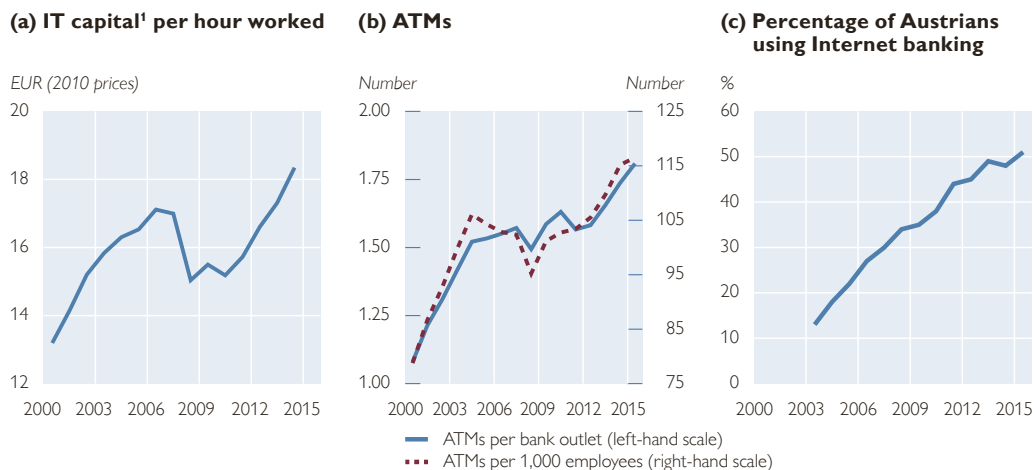
When computing became widespread in the 1960s, banks were early adopters of IT. For an indication of the banking sector's intensity of IT use, we refer to Eurostat's national accounts data, which break down gross fixed assets by industry and by type of asset. From this dataset, we take information and communication technology (ICT) equipment, computer software and databases to represent IT capital. We use net values, that is, the value of fixed IT-related assets less their depreciation, valued at current replacement costs and deflated by the implicit price deflator for this capital category. Between 1999 and 2014, the banking sector's real IT capital rose by 44%.²⁰ Relating the amount of IT capital available to the hours worked gives an indication of the sector's "IT capital intensity." As panel (a) in chart 10 shows, banks' IT intensity increased over the 15 years to 2015, interrupted only at the onset of the crisis: Whereas between 1999 and 2007, the amount of

¹⁹ This is an example of a wider phenomenon known as job polarization (see Autor, 2015), where computerization leads to an increase in the demand for highly skilled labor as well as low-skilled workers (in services), on the one hand, but to a decrease of the demand for medium-skilled workers performing routine task. Job polarization can be observed in many countries (Goos et al., 2014).

²⁰ The structure of IT capital shifted from equipment to software as the latter's share rose from below 60% in 1999 to 86% in 2014.

Chart 10

Indicators of IT use in banking



Source: Eurostat, ECB, OeNB.

¹ ICT equipment and computer software and databases.

IT capital per hour worked rose by 4.3% annually in real terms, the real annual growth rate came down to 1.1% in the 2008 to 2014 period.

However, data on banks' IT capital does not cover IT spending that is outsourced to external suppliers (see below). Thus, a somewhat cruder but nevertheless often used indicator of banks' IT usage is the rise of ATMs. The growth of the ATM network, which was introduced in Austria in 1980, still has not showed signs of slowing. Between 2000 and 2015, the number of ATM terminals grew by 48% (or 2.6% annually) to 8,744.²¹ The ascent of ATMs was accompanied by a steady reduction in the number of bank outlets (head offices and branches) from 5,479 in the year 2000 to 4,096 in 2015. Thus, the ratio of ATMs to bank outlets augmented from

1.08 in 2000 to 1.81 in 2015. Likewise, the ratio of ATMs to employees rose from 79 to 116 (per 1,000 employees) over the same period. The pattern is the same as with ICT capital, which featured a strong increase that was interrupted only by the onset of the crisis. Additionally, the percentage of Austrians who use internet banking quadrupled from 13% in 2003²² to 51% in 2015.^{23,24}

Another challenge the banking sector is currently facing is the advent of new internet competitors, usually referred to as financial technology (fintech) companies. Over the past decade, existing companies in several industries (ranging from music to travel to transportation) have come under severe pressure from Internet competition. In principle, new digital technologies have the potential to reshape the entire value-

²¹ However, not all ATMs are run by banks.

²² This was the first year for which Eurostat collected relevant data.

²³ According to a survey, approximately 40% of Austrians used mobile banking in 2013 (Zeh and Buchinger, 2013).

²⁴ Technological developments in the banking sector can be expected to be accelerated by financial technology (fintech) companies. In the past few years, a host of internet-based enterprises seeking to enter the market for financial services have sprung up to provide new applications, processes, products or business models. Intensified competition from fintech companies represents a potential threat for banks and could lead to a loss of business volumes (and revenues) with corresponding consequences for bank employment. For the impact of fintechs on banks and payment systems, see for example box 3 in Financial Stability Report 31, p. 45 (OeNB, 2016).

added chain of existing financial products and services. The question is whether and to which extent this also is going to happen in the banking sector and how it will affect the job market in the banking sector. While fintechs might be able to react faster to changing customer needs and thus potentially disrupt current business models, they also address customer groups that are currently not served by banks. Moreover, fintechs could become new distribution channels for banks and could reduce operating costs by using innovative technologies.

4.2 Organizational changes in banking

Labor demand has been affected by organizational changes at the level of individual banks. These organizational changes may reflect developments in the market for banking products. For example, rising wealth led to more consumption of banking products per customer, and changing customer preferences gave rise to a range of new products, such as the provision of advisory services in the sale of funds and insurance rather than the acceptance of savings deposits. Thus, a greater number of customers seeking e.g. to invest more wealth or to take out more loans have demanded more skill-intensive financial products. A special factor in Austrian banking was the *expansion of*

Austrian banks into the Central, Eastern and Southeastern European (CESEE) region, although its overall effect on employment in the domestic entities of the banking sector is not easy to quantify. Since the involvement of Austrian banks in this region usually served to develop and expand local markets, it is likely to have had positive effects on employment in Austria.²⁵ The headquarter functions of the domestic entities imply a growing workload in areas such as investment, human resources and risk management, accounting and compliance.²⁶ Furthermore, while subsidiaries performed most of the banking business in these new markets, the domestic entities of the Austrian banking groups also conducted more foreign business, in many cases complementing the financing and other services of the foreign operations. The CESEE earnings might also have alleviated pressures to reduce costs (and thus, staff) in the (much less profitable) domestic operations. Yet, there may have been labor substitution effects between parent banks and their affiliates, for example in the area of outsourcing (see below).²⁷

In contrast, there can be no doubt that the ongoing *consolidation process* within the Austrian banking sector has reduced labor demand. Between 2000 and 2015, the number of independent

²⁵ The number of foreign nationals in the banking workforce also rose from 3,700 or 4.8% of all bank employees in 2008 to 6,000 or 8.4% in 2015. This trend appears to reflect not only the opening of the Austrian labor market for workers from CESEE but also the growing internationalization of banking. Non-nationals in financial services fall into three groups of roughly the same size, namely into workers from the EU-14, from the new Member States in the CESEE region (the EU-10 plus Bulgaria, Romania and Croatia) and from non-EU countries. The latter group exhibits the most dynamic growth.

²⁶ One indication of the magnitude involved might be inferred from media reports that about 500 employees could be affected by UniCredit's decision to transfer direct control of Bank Austria's CESEE subsidiaries to the Italian headquarters. Of these 500 persons, between about 250 and 300 are directly involved in the control of the CESEE subsidiaries of Bank Austria; additionally, roughly 200 employees work for the bank holding. If that figure is any indication of the approximate size of the number of employees that work for the CESEE units in the other large Austrian banking groups, then banking employment in Austria directly related to the CESEE operations might be in the order of several thousands.

²⁷ However, the empirical evidence in the related literature on the effects of FDI does not provide a clear picture, especially not for the services sector. Looking at the home market effects of outward FDI into the CESEE region, Falk and Wolfmayr (2008) found limited evidence for the substitution of jobs between the parent companies in the EU-15 and their affiliates in CESEE between 2000 and 2004.

banks fell from 923 to 739, affecting the banking sector's demand for labor in several ways, from avoiding duplicate information technology infrastructures, or entire branches that are in close geographical proximity to each other, to eliminating redundancies resulting from the integration of back-office and general services.

Moreover, like banks in other countries and like other sectors, Austrian banks have increasingly resorted to *outsourcing* various activities in recent years. Outsourcing encompasses not only support activities such as IT services, procurement, accounting, real-estate agency services, call centers, catering, cleaning or security services, but also activities more closely related to “core banking” activities, like payment processing, lending and securities transactions. According to a survey on outsourcing conducted among union representatives in banks in June 2013 by the Austrian Chamber of Labour (GPA-djp, 2014), “classical” contracting out to external firms appears to be the most important strategy (60% of all cases included in the survey). But outsourcing could also happen to “internal” operations, which are shifted e.g. into a subsidiary that is fully owned by the outsourcing bank, a different subsidiary or a holding company to which the bank belongs. Thus, “internal” outsourcing might be part of the restructuring process of Austrian banks

mentioned above. Both “external” and “internal” outsourcing may happen to domestic or foreign firms. Outsourcing to foreign firms often takes the form of nearshoring to countries in Central and Eastern Europe.

The principal aim of outsourcing is to reduce costs, primarily personnel costs: External contractors tend to have lower earnings levels than the outsourcing banks. But even “internal” outsourcing to Austrian firms may reduce labor costs because other collective agreements may apply to the outsourced entities, for example the agreement for IT services or for crafts and trade services (“Allgemeines Gewerbe”). Outsourcing may also enhance efficiency²⁸ and may support the achievement of strategic aims. Moreover, outsourcing may also have the aim – especially in IT – to improve the quality of services obtained. Sometimes, getting access to specialist knowledge also plays a role (see Korschalla, 2013, for outsourcing in banking in Germany).²⁹ In terms of the overall evolution of employment in banking, the trend toward outsourcing implies that while “direct” employment in the banking sector has receded, the number of persons working indirectly in or for the banking sector in various support services may well have risen. However, no comprehensive data are available.³⁰

²⁸ Critics point out that outsourcing also involves many risks, such as a lack of control of the activities of, and increasing dependence on, external service providers, more complex decision-making structures and more complicated internal audits (see GPA-djp, 2014).

²⁹ Moreover, technological progress played a crucial role in the increase of outsourcing. On the one hand, IT enabled and facilitated outsourcing, as for example new ways of secure data transmission facilitated outsourcing to call centers. On the other hand, technological development raised the pressure for outsourcing, as IT services are not part of banks' core competencies.

³⁰ However, anecdotal evidence on “internal” outsourcing of various banks, especially of IT service firms, suggests that there has been a considerable increase of “indirect bank employment” in Austria. UBIS Austria (UniCredit Business Integrated Solutions) is a subsidiary of UBIS in Italy, which in turn is a subsidiary of UniCredit. UBIS Austria, which was founded in 2004, currently employs 1,800 staff, most of whom (about 1,500) are former employees of Bank Austria. UBIS Austria mainly delivers IT (but also back-office) services to Bank Austria, including services for operations in the CESEE region.

4.3 Outlook

Over the past few years, many banks have announced restructuring programs. But until recently, pressure to dismiss large numbers of employees appears not to have been very strong: In most cases, even those Austrian banks which have reduced employment seem to have refrained from layoffs, resorting to attrition (see section 1.2) and early retirement schemes instead (see Mayer et al., 2001, for the 1990s). This development probably reflected the rather consensual industrial relations in Austria. Compared to enterprises in other countries, Austrian firms are relatively reluctant to lay off workers and rather try to reduce working time instead. Company surveys confirm this tendency (Kwapil, 2009). Indeed, according to media reports, many banks have introduced programs to induce workers to share jobs and to work part-time when labor demand is low (the working time developments described in section 1.1 corroborate these reports).

Austrian banks have also avoided dismissals because employment protection provisions are comparatively strong: Nonterminable employment contracts for employees with more than 10 years of service were in place in the savings bank sector until end-2008, making layoffs impossible in many cases. Moreover, many banking employees have relatively high tenure and would thus be entitled to receive large severance payments if they were laid off.³¹

Many observers (including bank managers and unions) expect that banks will start to reduce personnel more actively. As a consequence, the most recent collective agreement of March 2016

includes a resolution to negotiate the terms of a labor foundation for bank employees that facilitates retraining of redundant workers. Early retirement and “golden handshakes” will probably be used more actively in the near future. Specifically, almost 2,800 employees of UniCredit Bank Austria have expressed their willingness to leave the bank under the conditions offered by the bank. These comprise mostly consensual terminations of employment contracts in combination with extra severance payments. About 2,000 employees will actually leave in the coming years, 1,000 of which will leave until the end of 2017 (Der Standard, 2016a and 2016b). For Austria as a whole, both the OeNB (OeNB, 2015) as well as other institutions, such as the public employment service, expect that employment in banking will be further reduced in the coming years. However, labor market statistics will probably not show the full amount of this decrease because in a number of cases, employees are dismissed from their duties but are still kept on the payroll (Arbeitsmarktservice Österreich, 2016).

5 Summary and conclusions

Since the onset of the crisis, the Austrian banking sector has faced a host of challenges that have led banks to accelerate their consolidation activities. In recent years, consolidation has begun to feed through to employment. Organizational measures ranging from bank mergers to the outsourcing of various activities to outright restructuring programs announced by a number of banks have reduced the demand for labor. In a first step, banks reduced the number of hours worked per person by sharply in-

³¹ Many employees in banking are entitled to severance payments under a scheme that no longer applies to newly hired employees. Under this scheme, they receive severance payments in the order of 9 monthly salaries (for employees with a tenure of 20 years or more) or 12 monthly salaries (for those with a tenure of more than 25 years).

creasing the part-time ratio. Only in the past few years was this trend toward part-time work accompanied by a reduction in the number of employees, mainly through attrition, while banks have mostly avoided layoffs so far. However, as novel an experience as these reductions in the number of workers or the total amount of hours worked may be for the Austrian banking sector, in an international perspective, they have been rather muted so far, implying that there might be room for further reduction in bank employment.

Apart from changes in the quantities of labor, the quality of the demand for labor in banking has undergone changes, too. The advances in technology and the increase in IT intensity in the banking sector in the past decades has not only led to the substitution of labor for capital, but also to a demand for more highly skilled labor, substituting clerical support workers with more highly specialized staff. The rising number of graduates employed by the financial sector that now exceeds the share of such skilled labor in the overall economy may well be explained by these requirements.

Earnings in banking are relatively high, but so is the value of human capital. Compared to employees in other sectors, employees in banking have high educational attainment, more tenure and are older. As long as higher earnings levels are related to higher productivity levels, they do not necessarily constitute

a cost problem. However, as compensation per employee has grown more strongly than productivity since the onset of the crisis, ULCs in banking have exhibited positive growth (which was still below ULC growth in the other sectors). Again, this might entail a further decrease in bank employment.

Structural change in the banking sector will help make the banking sector more resilient, and an efficient and productive banking system is an essential prerequisite for financial stability. Therefore, raising bank productivity by reducing redundancies in employment and by increasing the productive use of labor certainly constitutes a major contribution to the stability of the financial system, so that from a financial stability perspective, the issue of employment is undoubtedly a major cost factor. But at the same time, greater labor efficiency is also relevant for the question of how banks fulfill their economic role – and in a wider context for the development of Austria as a financial center. Thus, a mere look at headcount or personnel costs disregards the fact that banks rely on their employees to retain (or enhance) their competitive position. In this vein, sheer staff reduction is but one instrument that Austrian banks will have at their disposal to increase productivity. Other avenues to enhance bank performance are the reallocation of staff within the bank as well as retraining and other skill-enhancing measures.

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Annex

Employment in banking: a brief guide to the data sources

OeNB bank employment data. Data on the number of employees are collected by the OeNB on a regular basis and published annually. These data comprise the total number of employees as well as the number of full-time employees and part-time employees. The data exclude employees on (parental) leave and in military service as well as OeNB employees. Blue-collar workers are also excluded. Moreover, every quarter, all Austrian banks report the size of their workforce in terms of full-time equivalents for the asset, income and risk statement (formerly Quarterly Report).

ECB bank employment data. The OeNB data form the basis for input into the ECB's database on annual banking structural statistical indicators. However, the ECB includes only credit institutions that are classified as "monetary financial institutions" (MFIs). ECB data also exclude EU Member State credit institutions (defined according to Article 9, Austrian Banking Act); total employment in these credit institutions numbered 869 employees at the end of 2015.

National accounts employment statistics (ESA 2010). We derive data on employment (persons) and working time (hours worked) from the national accounts. In principle, annual data are available at the level of the NACE division K64 (financial service activities, except insurance and pension funding). However, working time data of some countries are missing, so we use NACE section K (financial and insurance activities) data for the international comparison in section 3. National accounts data also provide in-

formation on actual working hours, average labor costs and value added.

The European Union Labour Force Survey (LFS). Apart from employment and working time (normal working hours such as full-time and part-time employment), Eurostat's LFS provides information on the level of educational attainment and on the length of tenure in the current main job. The LFS is a household survey; the subsample for banking is rather small. Thus, the results for banking may be affected by sampling errors and unexplained changes from year to year.

Social security and other administrative data for Austria. These data deliver information on employment (social security data from the Association of Austrian Social Security Institutions, HSV), but also on unemployment, schooling, and on vacancies (from the public employment service, AMS). The employment data refer to standard contracts.³² Administrative data provide information on personal characteristics such as gender, nationality or age. Social security employment numbers refer to jobs, whereas the other sources refer to persons. Because the sectoral statistics exhibit a time series break between 2007 and 2008 (change from ÖNACE 2003 to ÖNACE 2008), we use mostly data from 2008 onward.

Table A1 gives an overview of the main characteristics and differences between the various data sources available for banking employment. Chart A1 shows the evolution of employment according to all sources mentioned. Apart from the erratic movements (and implausibly high level) of employment in the LFS series, all data sources consistently indicate an increase in employment up to 2008 and a decrease thereafter.

³² Standard contracts are equivalent to employees with full social insurance, including apprentices. Other social security statistics show that minor jobs ("geringfügige Beschäftigung") and freelance contracts ("Freie Dienstverträge") play a rather small role in financial services. On average in 2015, 2,400 persons were marginally employed, down slightly from 2,500 in 2008. Even fewer persons are engaged under freelance contracts: Fewer than 300 of these contracts were reported in 2015, less than half the corresponding number in 2008.

Table A1

Characteristics of employment data by data sources

	OeNB	ECB	National accounts (ESA)	Labour Force Survey (LFS)	Social security data
Banking sector definition	OeNB definition	ECB definition	NACE K64	NACE K64	NACE K64 ¹
Bank employment data include the OeNB	no	no	yes	yes	yes
Data refer to persons or jobs	persons	persons	persons	persons	jobs
Annual data refer to year-end or period average	end of year	end of year	period average	period average	period average
Nonstandard contracts included	yes	yes	yes	yes	no ²
Blue-collar workers included	no	no	yes	yes	yes
Data are based on full census or sample	full census	full census	full census	sample	full census
Employment data include employees on leave	no	no	employees on parental leave or in military or alternative service included	employees on parental leave included	employees on parental leave or in military or alternative service included
Working-time information available	full/part time and FTE	full/part time and FTE	actual hours	full/part time (actual hours) ³	no
Restrictions in time period (1998–2015) ⁴ , time series breaks	no	no	no	We use only data from 2004 (time series break).	Time series break between 2007 and 2008

Source: OeNB, ECB, Eurostat, HSV, Statistics Austria.

¹ For the years from 2008 on, NACE 4-digit employment statistics are available in the BALI database of the BMASK, which allow a more exact delimitation of the banking sector.

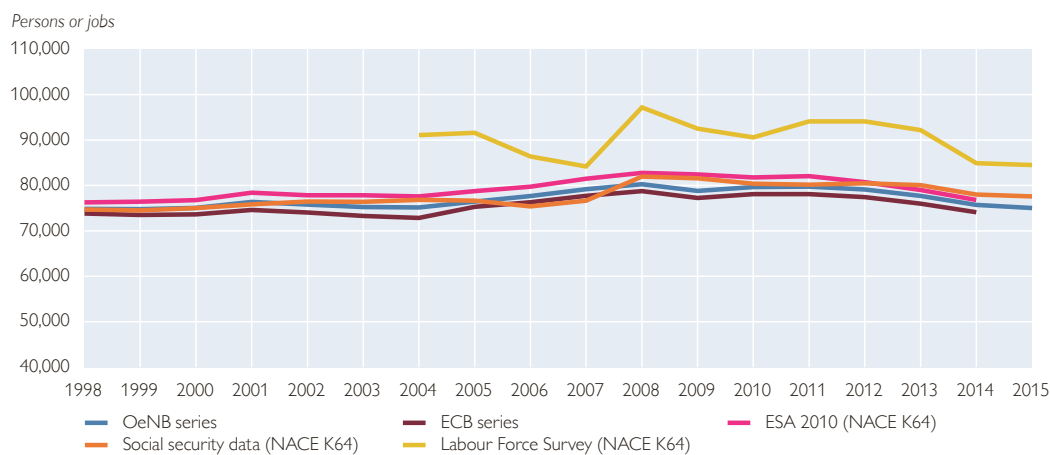
² Data on minor jobs are available in separate social security statistics.

³ The LFS provides only actual weekly hours worked in the reference week.

⁴ As of end-July 2016.

Chart A1

Banking employment according to various data sources



Source: OeNB, ECB, Eurostat, HSV, Statistics Austria.

Bail-in: who invests in noncovered debt securities issued by euro area banks?

During the financial crisis numerous banks experienced financial difficulties and were subsequently bailed out by governments using taxpayers' money. Policymakers around the globe responded by overhauling resolution mechanisms for banks, including the introduction of bail-in rules to prevent future taxpayer-funded bail-outs. Despite the initial optimism that bail-in would mitigate the too-big-to-fail dilemma, criticism highlighting the shortcomings of this approach has recently been voiced both in academia and in wider circles. Several researchers have noted the urgent need for a more detailed analysis of the structure of holdings of bail-in-able debt securities. The aim of this paper is twofold: First, we provide an overview of the main arguments for and against the bail-in tool, and second, we shed light on the question of who invests in senior unsecured debt securities issued by banks, drawing on the Securities Holdings Statistics of the ECB for evidence. Our empirical evaluation on the basis of unconsolidated national banking sectors in the euro area provides information on the structure of the demand and supply side of bail-in-able bank debt securities in each euro area country. We are able to show which portions of the outstanding bail-in-able bank debt securities issued by euro area banks on aggregate and in individual countries are held in which region (home country, non-home euro area and outside the euro area) and by which sector (i.e. banks, other financial institutions and nonfinancial sector) within the euro area. In particular, we find that nearly 40% of all bail-in-able debt securities issued by euro area banks are held outside the euro area; intra-euro area cross-border holdings account for one-third of all euro area holdings of such debt, euro area banks' holdings for one-third and the euro area's nonfinancial sector (mainly households) for one-fourth. As regards bail-in-able debt issued by Austrian banks, about 20% are held outside the euro area, while euro area banks hold about 36% and the euro area's nonfinancial sector about 38% of all euro area holdings of this debt.

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During the financial crisis numerous banks experienced financial difficulties and were subsequently bailed out by governments using taxpayers' money. Policymakers around the globe responded by comprehensively overhauling resolution mechanisms for significant banks in order to address the too-big-to-fail issue and to prevent future taxpayer-funded bail-outs. Spearheaded by the Financial Stability Board (FSB), a set of principles (FSB, 2011b and 2014) was developed with the aim of ensuring that failing systemically important financial institutions could be resolved in an orderly manner without

burdening taxpayers. In this process, the term “bail-in” was coined, meaning that claims of shareholders and unsecured creditors were to cover losses incurred by banks, either by means of writedowns or by converting their claims into equity. The FSB notes that “The objective of bail-in is to reduce the loss of value and the economic disruption associated with insolvency proceedings for financial institutions, yet ensure that the costs of resolution are borne by the financial institutions' shareholders and unsecured creditors” (FSB, 2011a).

Despite the initial optimism that bail-in would mitigate the too-big-to-

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fail dilemma, criticism highlighting the shortcomings of the approach have recently been voiced both in academia and in wider circles (e.g. Avgouleas and Goodhart 2015; Persaud 2014 and 2016; Stiefmüller, 2016). Several authors have noted that a more detailed analysis of the structure of holdings of bail-in-able debt securities is urgently needed. The only empirically grounded paper on the holdings structure of bail-in-able debt securities that has come to the authors' attention was published by the European Central Bank (ECB). In this paper by Halaj et al. (2016) possible direct contagion channels are analyzed, using proprietary ECB data covering the securities cross-holdings of the 26 largest euro area banking groups. The authors find that cross-holdings of bail-in-able debt are currently at low levels: On average, the percentage of subordinated debt and senior unsecured debt securities issued by one bank of these 26 banks and held by the other 25 of these banks out of the total nominal amount of such debt issued by that bank amounts to only 0.6% and 5%, respectively, which is equivalent to 0.01% and 0.6% of total assets, respectively. Thus, the bulk of bail-in-able bank debt issued by these large banks is held by other banks (than those 26), nonbank financial institutions (such as insurance companies) and nonfinancial institutions (e.g. households). The authors conclude that the potential for contagion of a bail-in operation of one of these large banks lies mostly with these other holders (Halaj et al., 2016).

The aim of this paper is to close the gap in research by taking a more comprehensive view and to shed light on the question of who invests in senior unsecured debt securities issued by banks, drawing on the Securities Holdings Statistics of the ECB for evidence.

This paper is structured as follows: Section 1 presents the different approaches to bail-in adopted for G-SIBs (global systemically important banks) by the FSB, the EU and the U.S.A. Section 2 sketches the ongoing discussion on the merits and potential pitfalls of bail-in. Section 3 details the volumes of noncovered bail-in-able debt securities issued by banks in the euro area, the volumes available for bail-in (from common equity tier 1 (CET1) and noncovered debt securities) and the holding structure of noncovered bank debt securities across EU countries, all based on the ECB Securities Holdings Statistics. Section 4 concludes.

1 Different approaches to bail-in worldwide

In its Key Attributes of Effective Resolution Regimes for Financial Institutions, the FSB (2011b and 2014) lists bail-in as one resolution tool that gives the resolution authority the power to write down equity as well as unsecured and uninsured creditor claims to the extent necessary. To ensure that systemically important institutions have sufficient loss-absorbing and recapitalization capacity available in resolution, the FSB introduced the Total Loss Absorbing Capacity (TLAC) (Financial Stability Board, 2015), which will become a mandatory Pillar I requirement for G-SIBs in 2019. The common minimum requirement will be that G-SIBs must have TLAC-eligible instruments as outstanding liabilities in the amount of 16% of risk-weighted assets (RWA) or 6% of the leverage ratio exposure (LRE), rising to 18% of RWAs or 6.75% of the LRE by 2022. TLAC-eligible instruments comprise regulatory own funds and TLAC-eligible debt. The latter must be both subordinated and unsecured debt and have a maturity of at least one year. Subordination can

be contractual, statutory or structural (meaning that the instrument is issued by a nonoperating holding company).

1.1 The European bail-in model

In the EU, bail-in was introduced by the Bank Recovery and Resolution Directive (BRRD) and had to be implemented in Member States' national law by January 1, 2016. The bail-in tool may be applied to all liabilities of an institution, excluding only:

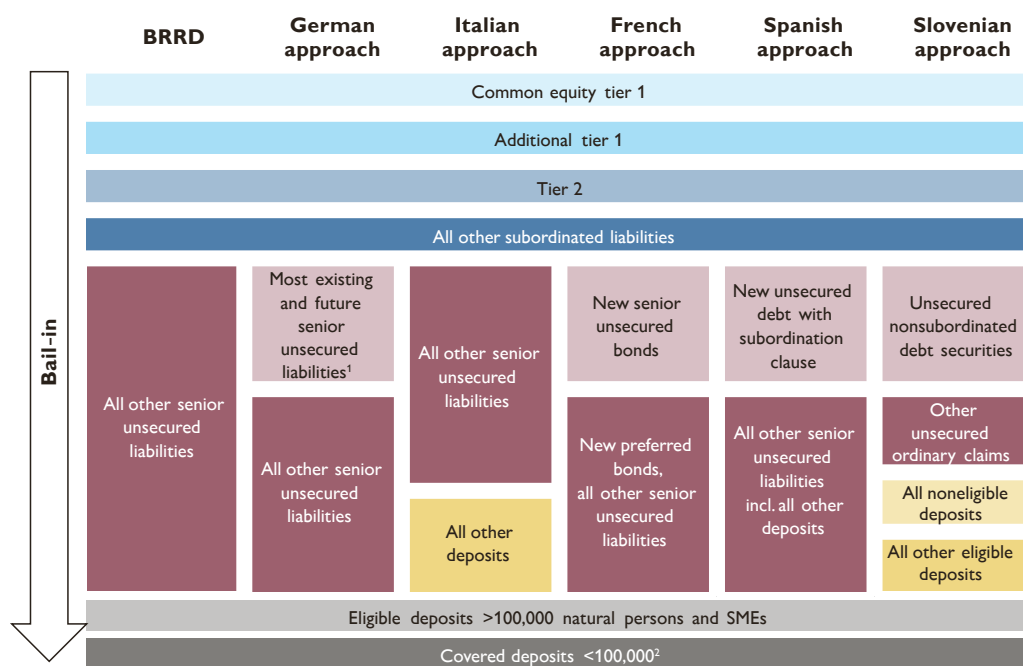
- 1) covered deposits,
- 2) secured liabilities (i.e. covered bonds),
- 3) client assets or client money,
- 4) liabilities that arise by virtue of a fiduciary relationship,
- 5) liabilities to institutions with an original maturity of less than seven days,
- 6) liabilities with a remaining maturity of less than seven days owed to systems or operators of systems designated as security settlements systems

- 7) liabilities to (a) employees, (b) commercial or trade creditors, (c) tax and social security authorities and (d) deposit guarantee schemes arising from contributions in accordance with the deposit insurance directive.

Moreover, the BRRD introduced the minimum requirement for own funds and eligible liabilities (MREL) to ensure that banks hold sufficient resources for the absorption of losses and for recapitalization. However, only specific bail-in-able liabilities are eligible to be included for MREL calculations (see also Metz et al., 2016). In particular, preferred deposits (i.e. deposits of households and SMEs that are basically eligible for coverage by deposit insurance, but exceed the amount of EUR 100,000) and liabilities with a maturity of less than one year do not count as fulfilling MREL requirements.

Chart 1

Loss absorption waterfall in the European Union



¹ Applies only to senior unsecured liabilities that are tradable and not declared as deposits; money market instruments are excluded.

² Bail-in contribution is borne by the deposit guarantee scheme.

One of the key uncertainties surrounding bail-in according to the BRRD in the EU is the bail-in waterfall, which leaves ample ambiguity as to the liabilities that will rank pari-passu with senior unsecured bonds, which fall into the category of all other senior unsecured liabilities (see first column of chart 1) unless they are explicitly subordinated. There are no clear indications as to which liabilities, such as corporate deposits, may be exempt due to political intervention in the event of a bail-in, the conundrum being that the “no-creditor-worse-off” principle dictates that no creditor should incur any losses under resolution that would not have been incurred in liquidation. If the holders of MREL-eligible liabilities are confronted with a situation where liabilities that rank pari-passu to their claims are exempt from bail-in, this may produce a stream of lengthy litigation, thereby possibly hampering the swift recapitalization of a bank.

In order to avert these uncertainties and create a reliable bail-in waterfall, some jurisdictions in Europe have amended the BRRD bail-in waterfall by passing legislation which clarifies the position of senior unsecured debt securities in the loss absorption waterfall versus other categories of liabilities.²

1.2 The U.S. bail-in model

In the United States the concept of bail-in for systemically important financial institutions (SIFIs) was introduced in the Dodd-Frank Act, requiring creditors and shareholders to bear all the losses of a financial company that has entered the Orderly Liquidation

Authority (OLA) process. Resolution involves two holding companies: HoldCo, which is the failed top-tier holding company, and NewCo, a bridge holding company into which healthy operating subsidiaries are transferred. HoldCo shareholders and creditors are left behind in the failed holding company, which is subsequently resolved. NewCo is established with the healthy assets of HoldCo, but with substantially fewer liabilities. Finally, a priority pyramid is established for claims against HoldCo which are satisfied after the bail-in haircut by means of a debt-for-securities exchange involving NewCo. However, unsecured creditors are not automatically converted into NewCo shareholders, but may be converted into unsecured creditors of NewCo.

Hence, in contrast to the European bail-in model, where the recapitalization of the distressed bank is one of the resolution options outlined in the BRRD (i.e. an “open bank process”), the U.S. bail-in model always implies a carve-out of healthy operational entities and a resolution of the HoldCo.

One of the main controversies surrounding the U.S. bail-model is the area of friction between formal insolvency, implying a CET1 ratio of 0%, and the Basel III requirement of a CET1 ratio of at least 4.5%. The main point of contention is that while regulators would presumably intervene before a significant financial institution reaches formal insolvency, this is problematic in the context of the “no-creditor-worse-off” condition, which states that the outcome for each creditor will be no worse than in formal liquidation. To

² On November 23, 2016, the European Commission published a proposal to introduce a new category of debt instruments, called “non-preferred” senior debt, which will rank between senior unsecured and subordinated debt in case of insolvency and bail-in. Under this category, banks can issue debt in the future and, hence, build up bail-in-able debt that is eligible for TLAC and MREL, respectively, over time. At the same time, this proposal does not affect the existing stocks of bank debt and their statutory ranking in insolvency and bail-in. Consequently, many of the current differences across countries regarding the bail-in waterfall would remain, but probably lose in importance in parallel to the accumulation of non-preferred senior debt liabilities.

some extent, the subordination requirement for TLAC-eligible instruments addresses this concern.

2 Discussions on bail-in

2.1 Arguments in favor of bail-in

After numerous bail-outs of banks during the financial crisis, the concept of bail-in, designed to protect taxpayers from exposure to bank losses, gained considerable traction. In particular, expectations of, inter-alia, the following *advantages* convinced policymakers to introduce bail-in:

A situation where a systemically relevant bank experiences financial difficulties very often puts governments in a difficult position. First, a disorderly liquidation could lead to substantial negative effects on financial markets and the real economy. Zhou et al. (2012) list the following three (related) sources of disruption: direct counterparty risk,³ liquidity risks and fire-sale effects in asset markets⁴ and contagion risks.⁵ The bail-in tool, together with other resolution tools, may have the potential to somewhat mitigate these risks (Zhou et al., 2012).

Second, a government bail-out of a bank signals to both the bank and its shareholders and creditors that they will not have to bear losses stemming from risks that banks assumed, thereby creating moral hazard and leading to riskier behavior of bank management, shareholders and creditors (Hakenes and Schnabel, 2010). Hence, bail-in should reduce moral hazard by forcing shareholders and creditors to bear the losses of the risks they have accepted.

Third, in connection with the moral hazard attitude taken by banks' creditors, there is evidence that espe-

cially large banks that financial market participants consider to be systemically important have benefited from an implicit state guarantee or at least the perception of such a guarantee (Denk et al., 2015; Hindlian et al., 2013; IMF, 2014; Noss and Sowerbutts 2012; Schich and Kim, 2012; Schich and Lindh, 2012; and Schich and Aydin, 2014). In other words, at least some banks have been able to refinance themselves at lower costs on the assumption that if they were to experience financial difficulties the government would bail them out. If a credible bail-in perspective is established for such large banks too, the associated implicit state guarantee will be reduced and creditors will have to expect to bear their share of a bank's losses so that they will demand a risk premium for bail-in-able claims. However, this also implies that market-based refinancing costs for banks will adjust and – ceteris paribus – should increase to a permanently higher level.

In order to assess the credibility of the bail-in mechanism, the ratio of the average bank credit default swap (CDS) premium to the sovereign CDS premium for six major European economies during two distinct time periods were examined by Mikosek and Schildbach (2016): the first period is between September 2008 and December 2014 and the second starts in 2015, when the BRRD had to be implemented in national law in the EU. The paper concludes that the markets perceive the bail-in model in the EU to be credible, which is reflected in a substantial rise in the ratio of the average bank CDS premium to the sovereign CDS premium since the beginning of 2015 in all

³ When the failing institution fails to meet its financial obligations or high demand for collateral (or "margin").

⁴ When the distressed institution is forced into asset sales to obtain liquidity, which further depresses asset prices (and thus raises demand for higher "margin") and causes credit crunches.

⁵ When the panic caused by the failure of one institution spreads to other financial institutions; the failure of one bank could easily lead to a system-wide destabilization if creditors lose their confidence in the whole banking sector.

six countries covered by the study (Mikosek and Schildbach, 2016).

Fourth, a large-scale government bail-out could lead to the fiscal destabilization of a whole country. By contrast, bail-in could to some extent break the vicious cycle between sovereign and bank debt. These interlinkages became particularly visible in some countries in the euro area during the financial crisis (Zhou et al., 2012).

Fifth, it can also be observed that public interventions for a bank's rescue to avoid bank insolvency procedures have often resulted in a further concentration of the banking sector through mergers; and this exacerbated the too-big-to-fail problem even further (Zhou et al., 2012).

2.2 Arguments against bail-in

However, despite the numerous far-reaching advantages of bail-in detailed above, a growing number of researchers and policymakers are voicing concerns that substantial risks are associated with bail-in. Some of them acknowledge that bail-in may be the superior resolution strategy in the case of idiosyncratic failures (Avgouleas and Goodhart, 2015; Persaud, 2016), but also point out substantial shortcomings of the bail-in tool:

First, the above-mentioned increase in refinancing costs as a result of the introduction of bail-in tools and the abolition of implicit state guarantees could be substantial. The higher refinancing costs can be expected – *ceteris paribus* – to lead to a permanently higher level of average bank lending rates and to a reduction of credit supply from (possibly elevated) previous levels (Denk et al., 2015).

Second, bail-outs by taxpayers cause many players to lose a little⁶ each, while

in a bail-in scenario comparatively few players lose a lot. Hence, bail-in has the potential to significantly increase the incentives for litigation, which will probably make the bail-in procedure complex, time consuming and expensive (Avgouleas and Goodhart, 2015).

Third, bail-in may increase procyclicality because a weakening bank will find funding increasingly difficult and expensive to come by. Emergency liquidity funding may be constrained by restrictions on any support that burdens taxpayers. Under the EU approach, where resolution is undertaken at the legal entity level, business creditors may be exempted from a bail-in, hence shifting the burden disproportionately to holders of noncovered debt securities and uncovered depositors. As a result, applying a bail-in instead of a bail-out model shifts the burden from taxpayers to pensioners and savers (Avgouleas and Goodhart, 2015).

Fourth, in a similar vein, some critics focus on specific liabilities that will be subject to bail-in. De Grauwe (2013) argues that bailing in deposits over EUR 100,000 will lead to more bank runs as large depositors seek to save their money, and thus to stronger contagion between troubled sovereigns and large banks, and to a burden on economies due to the interconnection between businesses using the same payment system. As a consequence, we arrive at a situation where the moral hazard of a bail-out is pitted against the immediate risks a bail-in poses to the economy.

Fifth, Persaud (2016) argues that bail-in-able securities are a form of market-priced insurance instrument and will tend to be mispriced if an unanticipated financial crash occurs, generating heavy and simultaneous losses to investors in bail-in-able debt securities.

⁶ However, we would like to add that this is true only unless fiscal consolidation measures in response to higher general government debt hit certain segments of the population in a severely disproportionate manner.

Also, an unexpected bail-in of one type of instrument is likely to lead to a downgrade of other instruments with a bail-in-able feature. In these cases, any widespread distribution of bail-in-able debt securities is likely to produce a crisis that is centered in financial markets, as opposed to one that is contained to several banks (Persaud, 2016).

Sixth, bail-in-able debt securities may be held by suboptimal investors. Götz and Tröger (2016) argue that ideal investors in bail-in-able debt securities should be sophisticated, active outside the banking sector and not subject to an asset-liability mismatch due to their investment strategy. The authors stipulate that insurance companies, pension funds, other financial institutions (like investment funds or money market funds) or high net-worth individuals represent ideal holders of bail-in-able debt securities as they are able to incur the potential short-run costs of a bail-in due to their long investment horizon although they may not have a maturity-matched balance sheet. In contrast, Götz and Tröger (2016) see households as suboptimal investors based on recent bail-in experiences in Italy and Portugal. They state that households are not sophisticated investors and are unlikely to charge an adequate risk premium for bail-in-able debt securities, limiting the market-disciplining effect of bail-in (Götz and Tröger, 2016).

In this context, Deutsche Bank Research postulates that investors should be professionally able to hedge the default risk of bail-in-able debt securities or at least be aware of the default risk but interested in the potentially higher return, regardless of the sector the investor belongs to (Mikosek and Schildbach, 2016).

It has to be noted that there is no uniform view of whether all above-mentioned institutional investors are indeed

ideal holders of bail-in-able debt. Regarding holdings by pension funds, the long-term nature of their investments may cause the bulk of the burden of bank failure to be lifted from taxpayers at large and transferred to pensioners. Persaud (2016) argues that this is likely to have more detrimental effects on the economy than burdening all taxpayers, as pensioners spend more of their income. Moreover, he argues that long-term investors such as pension funds⁷ should not hold bail-in-able debt securities but prefer instruments whose risks fall over time, such as public and private equity instead. This would put long-term investors in the position to act as heterogeneous agents in a crisis, providing liquidity when other institutions are forced into a fire-sale of assets (Persaud, 2016).

However, some of the above-mentioned potential risks associated with the bail-in concept – especially with regard to investors in bail-in-able securities – have been recognized by policymakers and supervisory authorities and, thus, have already been addressed to some extent. First, with regard to the potential risk inherent in cross-holdings of bail-in-able securities by banks, the Basel Committee on Banking Supervision (BCBS) has issued a requirement for internationally active banks (both G-SIBs and non-G-SIBs) to cap their holdings of bail-in-able securities issued by G-SIBs, i.e. TLAC-eligible instruments (BCBS, 2016). If these holdings exceed a certain threshold banks have to deduct the excess amount from their tier 2 capital. These restrictions are also expected to be transposed into EU law. However, policymakers should consider extending these restrictions also to instruments issued by large non-G-SIBs in order to effectively pre-empt potential intra-sectoral con-

⁷ Indeed, this argument would extend also to insurance companies.

tagion effects. Second, with regard to private investors holding or investing into bail-in-able debt securities, the European Securities and Markets Authority (ESMA) has published a statement that credit institutions and investment firms (also with respect to their portfolio management activities) should inform clients on the risk inherent in bail-in-able instruments (ESMA, 2016). Transparent information on potential risks of these instruments should prevent misselling.

Balancing the pros and cons of the bail-in tool, one may highlight its merits with respect to strengthening the resilience of individual banks and making several bank stakeholders (shareholders, creditors and authorities) better prepared for possible adverse developments. Also, it is a very useful tool to deal with idiosyncratic bank failures. At the same time, any bail-in tool has to be designed in a way that potential adverse effects (in particular contagion effects) are kept to a minimum, especially with regard to the holders of bail-in-able securities. In this way, the unavoidable costs of bail-in can be expected to be less harmful than the large costs of bail-outs. However, even if a credible bail-in tool is in place, there may still be the need to address the too-big-to-fail problem also by other means (e.g. reducing the complexity of banking groups, limiting or reducing the size of extremely large banking groups). Moreover, in addition to implementing bail-in, there may nevertheless be the need for credible ultimate common public backstops, in particular in case of unexpected financial crashes,

systemic crises or the need to contain effects of idiosyncratic failures in a timely manner.

3 Noncovered debt securities issued by euro area banks: stock-taking exercise

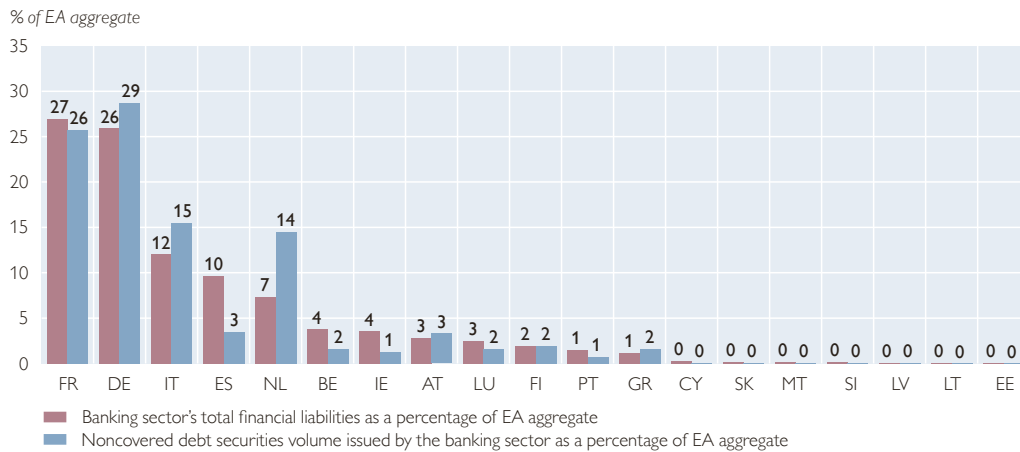
3.1 The supply side: who issued what amount of bail-in-able bank debt securities in the euro area?

Chart 2 below shows the share of each euro area country's banks in the aggregated total financial liabilities (including all debt and equity positions) of euro area banks. The figures are based on the unconsolidated national banking sectors (numbered as sector S.122) according to integrated financial accounts statistics. It is no surprise that the banking sectors of France, Germany, Italy, Spain and the Netherlands together account for the bulk of euro area banks' aggregated total financial liabilities, namely about 82%. Interestingly though, the banking sectors of these five countries have issued an even higher share of the outstanding volume of noncovered debt securities⁸ issued on aggregate by euro area banks, nearly 90%. A comparison of the country-wise distribution of banks' total financial liabilities across the euro area with that of the outstanding volume of noncovered debt securities issued by banks shows that five countries stand out in which banks' share of such outstanding debt significantly exceeds their corresponding share in total financial liabilities: Germany, Italy, the Netherlands, Austria and Greece. By contrast, France, Spain, Belgium, Ireland, Luxembourg and Portugal have comparatively smaller amounts of such outstanding debt.

⁸ The ECB's Securities Issues database provides the outstanding volume of debt securities issued by each country's banking sector. The ECB's Securities Holdings Statistics (SHS) database shows total holdings of debt securities issued by each country's banking sector (for more details on the SHS see ECB, 2015). For most countries, the latter are somewhat lower than the total outstanding volumes of issues for reasons of incomplete reporting of holdings, etc. We assume that for each country total holdings of covered debt securities (provided by the SHS database) deviate by a similar relative amount from the outstanding volumes of covered debt securities issued in order to derive the country-specific outstanding volume of covered debt securities issued and thus of noncovered debt securities. All data as of the end of 2015.

Chart 2

Distribution of the euro area's aggregated banking sector liabilities positions by country



Source: ECB, Eurostat, OeNB.

Note: EA = euro area. Banking sector: Sector S.122, deposit-taking corporations except central bank, of the unconsolidated integrated financial accounts.

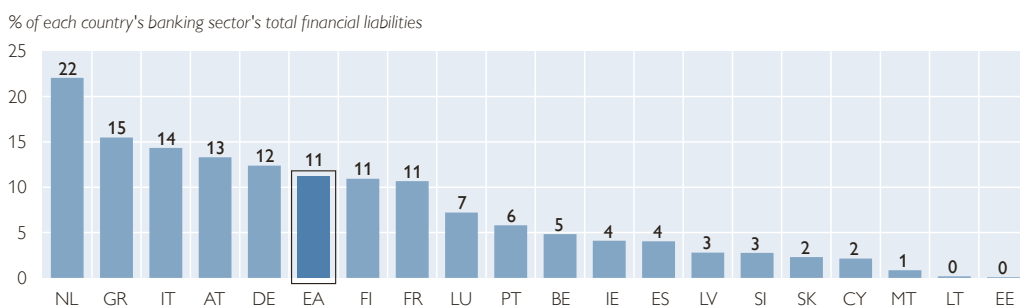
Providing a different perspective, chart 3 shows the outstanding noncovered debt securities volume issued by the banking sector (as a proxy for bail-in-able debt securities issued) relative to banks' total financial liabilities for each euro area country and the euro area aggregate. The aggregate euro area ratio is 11%. The banking sectors of smaller countries in terms of GDP, like Cyprus, Estonia, Lithuania, Latvia, Malta, Slovenia, and Slovakia, show particularly low ratios of bail-in-able

debt securities outstanding. This finding suggests that banking sectors in countries with less deep and liquid capital markets (which are typical for smaller euro area countries) have a structural disadvantage in using noncovered debt securities to augment their cushions for a possible bail-in.

In the context of any possible bail-in, the first line of defense would be banks' CET1. We note that other parts of banks' total own funds (i.e. additional tier 1 and tier 2) are to a considerable

Chart 3

Volume of noncovered debt securities issued by the banking sector



Source: ECB, Eurostat, OeNB.

Note: EA = euro area. Banking sector: Sector S.122, deposit-taking corporations except central bank, of the unconsolidated integrated financial accounts.

extent part of noncovered debt securities. Unfortunately, CET1 ratios of the unconsolidated banking sectors are not available for all euro area countries. As a proxy for this missing piece of information, we apply the CET1 ratio of each country's consolidated banking sector (augmented by foreign subsidiaries operating in this country). We argue that each country's banks' policies with respect to their capital positions on the unconsolidated level are probably not fundamentally different from those on the consolidated level, so that such a proxy can be used in order to gain a bird's-eye view of the order of magnitude involved. Usually, unconsolidated CET1 is higher than consolidated CET1, meaning that we probably underestimate the loss-absorption capacity of CET1 for bail-in. Hence, we derive a combined proxy ratio of bail-in-able capital and debt securities to total financial liabilities that is somewhat too low. Besides, we note that our analysis does not include other bail-in-able debt items like, in particular, certain deposits.

In chart 4, we thus compare the estimated CET1 volume and the estimated outstanding noncovered debt securities volume issued by each coun-

try's banking sector, both expressed in terms of banks' total financial liabilities. It is striking that banking sectors of the above-mentioned smaller countries in terms of GDP show particularly high above-average CET1 ratios. Nevertheless, these high capital volumes are generally not sufficient to fully compensate for below-average noncovered debt securities volumes, so that the sum of both bail-in-able items remains below the euro area average of 16.7%. However, other countries, namely Belgium and Spain, show the lowest values for the sum of both bail-in-able items. By contrast, the sum of both bail-in-able items lies above the euro area average in the Netherlands, Greece, Italy, Austria and Germany.

3.2 The demand side: who holds what amount of bail-in-able debt securities issued by euro area banks?

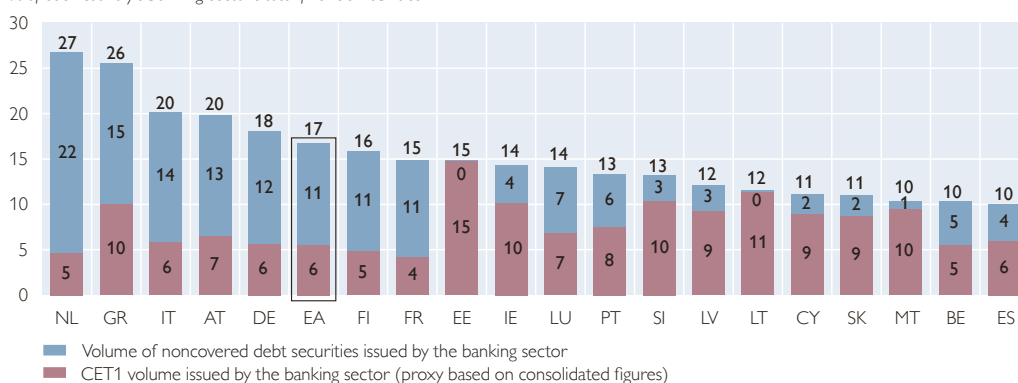
In this subsection, we take a look at the structure of holdings of noncovered debt securities issued by euro area countries' banking sectors.

Chart 5 shows the share of *euro area holders* as opposed to that of *non-euro area holders* in the total outstanding

Chart 4

Outstanding volume of bail-in-able capital and noncovered debt securities

% of each country's banking sector's total financial liabilities



Source: ECB, Eurostat, OeNB.

Note: EA = euro area. Banking sector: Sector S.122, deposit-taking corporations except central bank, of the unconsolidated integrated financial accounts.

volume of noncovered debt securities issued by each country's banking sector.⁹

Overall, non-euro area holders – for whom we unfortunately lack more precise information – account for nearly 40% of all bail-in-able debt securities issued by euro area banks. This signals that large-scale bail-ins of debt securities holders may have non-negligible contagion effects on the rest of the world.

The above-average share of non-euro area holders of debt issued by German and Dutch banks reflects the latter's strong position in the global funding market. Given the large weights of their bank debt within the euro area aggregate, Germany and the Netherlands lift the euro area average substantially. In some countries, like Estonia, Finland and Latvia, the very high share of non-euro area holders of their bank debt securities may be related to direct funding (or issuance guarantees) by non-euro area parent banks.¹⁰

By contrast, Italy, Greece and Cyprus stand out in terms of the very low share of non-euro area holders of outstanding noncovered debt securities issued by their banks.

For *euro area holdings*, the following further in-depth analysis of the structure of holdings is possible.

3.2.1 The shares of euro area sectors in total euro area holdings of bail-in-able debt securities issued by euro area banks

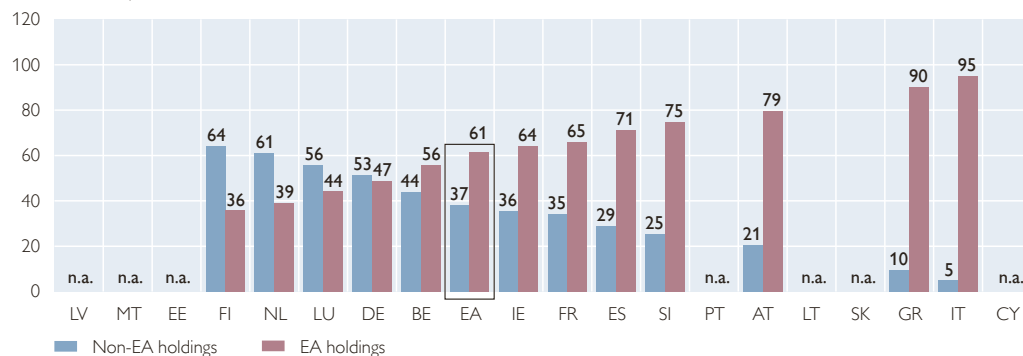
We now look at the *shares of individual euro area sectors* in total euro area holdings of noncovered debt securities issued by euro area banks on aggregate or (further below) by each country's banking sector.

Overall, *euro area banks* (sector S.122) themselves hold roughly one-third (33%) of all euro area holdings of bail-in-able debt securities *issued by euro area banks on aggregate*. This type of intra-sectoral connectedness may create severe conta-

Chart 5

All sectors¹ holdings of noncovered debt securities issued by each country's banking sector

% of each country's banks' total issued volume



Source: ECB, OeNB.

¹ Excluding central banks.

Note: EA = euro area. Banking sector: Sector S.122, deposit-taking corporations except central bank, of the unconsolidated integrated financial accounts. Non-EA holdings partly include residuals between total holdings and total issued volumes.

⁹ We note that the non-euro area holdings include the (mostly minor) statistical difference between total holdings and the larger outstanding volumes of non-covered debt securities issued.

¹⁰ However, in Estonia, Latvia and Malta, the share of non-euro area holdings is boosted also by unusually large amounts of the residual between total holdings and total issued volumes, which is included in this share.

gion effects in case of actual large-scale bail-in operations, in particular if such a bail-in operation does not result from a bank's idiosyncratic problems only. The relatively large share of holdings by euro area banks on aggregate may hide one of the following two possible patterns:

- 1) The holdings of bail-in-able debt securities are spread across euro area banks so that most banks are below a relevant holding threshold.
- 2) The holdings of bail-in-able debt securities are not sufficiently spread across euro area banks, meaning that some of the euro area banks have to reduce their bail-in-able debt holdings to comply with a relevant holding threshold.

In this context, we see the need for further in-depth research.

Other financial institutions (OFIs) of the euro area hold 42% of all euro area holdings of bail-in-able debt securities issued by euro area banks. In this study this group comprises the sectors S.123 (money market funds, MMF), S.124 (non-MMF investment funds), S.125 (other financial intermediaries, except insurance corporations and pension funds, including financial vehicle corporations engaged in securitization transactions (FVC), security and derivative dealers, financial corporations engaged in lending and specialized financial corporations), S.128 (insurance corporations) and S.129 (pension funds). In general, this quite heterogeneous sector tends to have an adequate matching of maturities of assets and liabilities and is usually well-positioned to bear losses. However, as regards pension funds, one has to bear in mind that losses will ultimately be borne by pensioners, who tend to spend a higher proportion of their incomes (see also Persaud, 2014 and 2016, on this point) and who partially belong to less well-off segments of society.

Finally, nearly one-fourth (24%) of euro area holdings of bail-in-able debt securities issued by euro area banks are accounted for by the *euro area's non-financial sector*, comprising the sectors S.11 (nonfinancial corporations, NFCs), S.13 (general government) and, above all, S.14 (households) and, as a minor item, S.15 (nonprofit institutions serving households). In fact, households account for the bulk of this share. This comparatively high share of households as investors in bail-in-able bank debt securities may be considered as problematic from both a consumer protection and a financial stability viewpoint. Several authors, for instance Götz and Tröger (2016), have highlighted this issue, citing in particular cases in Portugal and Italy. Among other things they pointed out that households are suboptimal investors in bail-in-able debt securities because they are unlikely to exert an adequate monitoring function or to demand adequate risk premia, which reduces the intended stability-enhancing effect of the bail-in tool. Moreover, while one may presume that these households typically belong to wealthier segments of the population, a nonnegligible part of this share may not fit this description, especially in countries where this share is particularly high (see below). Thus, recent measures taken by ESMA to enhance obligations to provide information for clients with respect to the risks inherent in bail-in-able instruments are certainly welcome.

Looking at the country level (see chart 6), *euro area banks* account for the large majority of the euro area holdings of bail-in-able debt securities issued by banks in Cyprus and Greece, and they hold about 50% of such debt securities issued by banks in Germany and a substantial part of Portuguese bank debt securities. This signals that bail-ins for German banks would tend to have par-

ticularly large intra-sectoral contagion effects within the euro area. While the share of banks in total euro area holdings of Austrian and Italian bank debt securities is close to the euro area average, it is significantly lower for Belgian, Spanish, Finnish, French, Irish, Luxembourg and Dutch bank debt securities outstanding.

The euro area's nonfinancial sector has a high share in total euro area holdings of bail-in-able debt securities issued by banks in the three Baltic countries. This may be due to the fact that mainly subsidiaries of foreign (mostly Swedish) parent banks operate in these countries and that these subsidiaries may be considered as very stable (compared to the rest of the domestic economy) by a large part of the population. Apart from the Baltic countries, the nonfinancial sector has an above-average share in total euro area holdings in the case of Italian, Austrian and German bail-in-able bank debt securities. Interestingly, for the bank debt securities issued in

the above-mentioned seven countries for which euro area banks have a below-average share in total euro area holdings (Belgium, Spain, Finland, France, Ireland, Luxembourg, Netherlands) also the euro area nonfinancial sector has a below-average share.

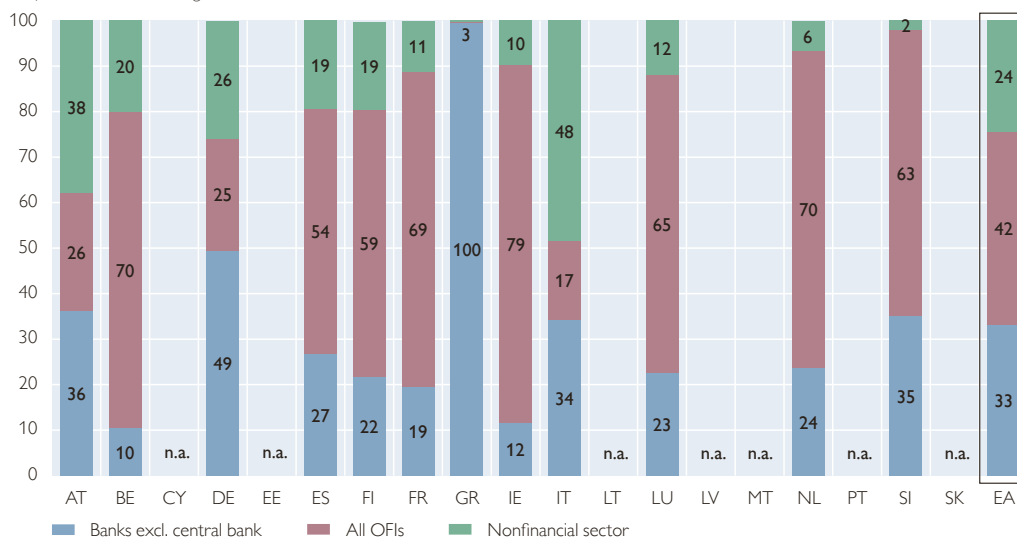
In turn, this implies that *euro area OFIs* have a comparatively large share in total euro area holdings of bail-in-able debt securities issued by banks in these seven countries. This signals that bail-ins for these countries' banks would tend to be somewhat less problematic, with the caveat mentioned before regarding pension funds still holding, however. By contrast, euro area OFIs have a relatively low share in total euro area holdings of Italian, Austrian and German bail-in-able bank debt securities issued by banks.

Taking a broader view by *combining these findings with the share of non-euro area holdings*, which are likely to consist largely of OFI holdings, it is striking that for four of the aforementioned seven

Chart 6

Euro area holdings of noncovered debt securities issued by each country's banking sector

% of total euro area holdings



Source: ECB, OeNB.

Note: EA = euro area. Banking sector: Sector S.122, deposit-taking corporations except central bank, of the unconsolidated integrated financial accounts.

countries, namely for Belgium, Finland, Luxembourg and the Netherlands, the high share of OFI holdings in total euro area holdings of these countries' bank debt securities comes on top of the above-average share of non-euro area holdings. For Germany, the above-average share of non-euro area holdings (likely to consist largely of OFI holdings) somewhat compensates for the low share of OFI holdings in total euro area holdings of its bank debt securities, while for Italy, the low share of non-euro area (OFI) holdings aggravates the implications of the low share of OFI holdings in total euro area holdings.

3.2.2 The home bias in total euro area holdings of bail-in-able debt securities issued by euro area banks

We now turn to the *share of home (that is, issuing) country's euro area holders as opposed to that of intra-euro area cross-border holdings*¹¹ in the total euro area holdings of noncovered debt securities issued on aggregate by euro area banks or (further below) by each country's banking sector.

Overall, non-home country euro area holders (intra-euro area cross-border holdings) account for roughly one-third (33%) of all euro area holdings of bail-in-able debt securities *issued on aggregate by euro area banks*. The breakdown of total euro area holdings by country shows that three countries (France, Germany, Italy) account for 71% and five countries (the top three plus Luxembourg and Ireland) hold 85% of these instruments.

Looking at the country level, for bail-in-able debt securities issued by banks in Belgium, Finland, Ireland, Luxembourg, the Netherlands and Slovakia, the share of intra-euro area cross-border holdings in total euro area holdings

is far above 50% (see chart 7). In four of these six countries, namely in Belgium, Finland, Luxembourg and the Netherlands, this high share comes on top of the above-average share of non-euro area holdings. Moreover, in all these six countries, the high share of non-home country euro area holders in total euro area holdings is typically coupled with a high share of euro area's OFI holdings in total euro holdings. It follows that any bail-ins for these countries' banks would tend to burden their domestic economies only to a limited extent. Interestingly, in all these six countries, the non-home euro area holders are concentrated on three (different) countries, with these top three countries accounting for more than 50% of all euro area holdings only in the case of these six countries.

By contrast, the home bias of euro area holdings is large not only for debt securities issued by banks in smaller countries (Cyprus, Malta, Baltic countries) and in Greece and Portugal, but also in Italy (85%) and in Germany, France and Spain (with a share of home-country holders in total euro area holdings of around 70%). Again, for Germany, the implications of this finding are attenuated by the above-average share of non-euro area holdings. On the other hand, for Italy, the substantial home-bias of euro area holdings coupled with the low share of non-euro area holdings, tend to make this country's domestic economy vulnerable to any bail-ins for its banks.

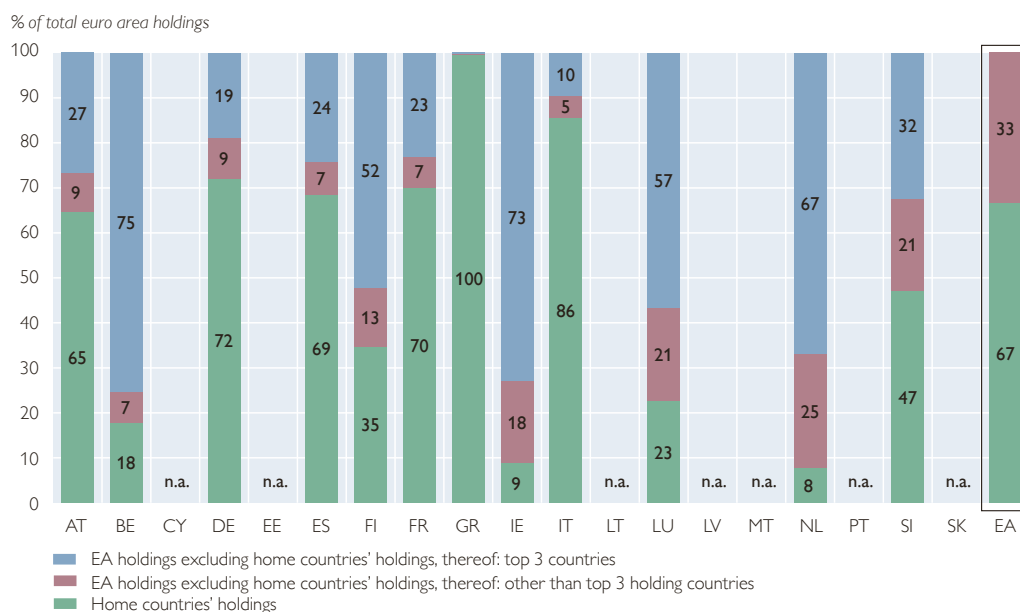
4 Conclusions

In recent years there have been widespread efforts to put in place sound and viable bail-in regimes for banking resolution. However, the bail-in regimes that have been introduced differ around the

¹¹ That is, holdings by non-home country euro area holders.

Chart 7

All sectors¹ euro area holdings of noncovered debt securities issued by each country's banking sector



Source: ECB, OeNB.

¹ Excluding central banks.

Note: EA = euro area. Banking sector: Sector S.122, deposit-taking corporations except central bank, of the unconsolidated integrated financial accounts. Non-EA holdings partly include residuals between total holdings and total issued volumes.

globe (e.g. in the EU and the United States). Even within the EU, the loss absorption waterfalls differ across jurisdictions (see chart 1). This introduces an additional level of complexity and uncertainty for market participants which could lead to significant obstacles to bail-in, particularly for an internationally active bank. As the bail-in regime in the EU, notably regulations regarding MREL, is not yet in line with the international framework established by the FSB for G-SIBs, the EU is currently in the process of revising the BRRD to align the European framework with FSB guidelines. This could provide an opportunity to adopt further adjustments, like, in particular, the harmonization of loss absorption waterfalls in the EU, which would considerably enhance transparency for market participants.

Meanwhile, the discussions on the concept of bail-in and the necessary

conditions for a credible and stability-enhancing bail-in regime are ongoing. Despite the many advantages of a bail-in regime for resolution, academia has recently highlighted a number of important shortcomings of the bail-in tool: (1) the possibly significant permanent increase in banks' refinancing costs following the introduction of a bail-in model; (2) the likelihood of lengthy litigation due to the distribution of losses among comparatively few players, which may adversely affect the speed at which a bail-in can be carried out; (3) the risk that bail-in may increase procyclicality and may shift the burden from taxpayers to pensioners and savers; (4) the possibility that the bail-in of depositors may trigger bank runs; (5) the threat that bail-ins for one bank may have contagion effects on other banks; and (6) uncertainties as to who should invest in bail-in-able debt

securities in order to ensure economic and financial stability in the event of a large-scale bail-in; specifically, there are doubts concerning households as holders of such debt.

Taking into account the arguments in favor of and against bail-in, one may highlight the tool's merits with respect to strengthening the resilience of the individual bank and rendering bank stakeholders (shareholders, creditors and authorities) better prepared for possible adverse developments. Also, it is a very useful tool to deal with idiosyncratic bank failures. At the same time, any bail-in tool has to be designed in a way that potential adverse effects (in particular contagion effects) are kept to a minimum, especially with regard to the holders of bail-in-able securities. In this way, the unavoidable costs of bail-in can be expected to be less harmful than the high costs of bail-outs. However, even if a credible bail-in tool is in place, there may still be the need to address the too-big-to fail problem also by other means (e.g. reducing the complexity of banking groups, limiting or reducing the size of extremely large banking groups). Moreover, in addition to implementing a bail-in regime, there may nevertheless be the need for credible ultimate common public backstops, in particular in case of unexpected financial crashes, systemic crises or the need to contain effects of idiosyncratic failures in a timely manner.

This paper contributes to the discussion by providing – to our best knowledge – a first comprehensive stock-take of the structure of holdings of noncovered debt securities issued by banks in the euro area.

Our empirical evaluation on the basis of unconsolidated national banking sectors in the euro area suggests that banking sectors in countries with less deep and liquid capital markets (as is

typical for smaller countries in terms of GDP) appear to have a structural disadvantage in using noncovered debt securities to build up a cushion for a possible bail-in. The above-average CET1 ratios of banking sectors in these countries are insufficient to fully compensate for below-average noncovered debt securities volumes.

On the demand side, the large share of non-euro area holdings in the outstanding volume of bail-in-able debt securities issued by euro area banks may indicate that large-scale bail-in operations for euro area banks may have non-negligible contagion effects on the rest of the world.

Concerning euro area holdings of bail-in-able debt securities issued by euro area banks on aggregate, the fact that euro area banks account for a large share in total euro area holdings reflects a large degree of intra-sectoral connectedness that may create severe contagion effects in case of actual large-scale bail-in operations, in particular if such an operation does not result exclusively from the idiosyncratic problems of a particular bank. Moreover, for noncovered debt securities issued by banks in Cyprus, Greece, Germany and Portugal, the share of euro area banks and thus intra-sectoral connectedness is particularly large. In this context, recently issued new Basel standards appear to be a step in the right direction, but do not seem to be far-reaching enough.

On the other hand, the quite substantial share of households in total euro area holdings of bail-in-able debt securities issued on aggregate by euro area banks may be considered as problematic from a financial stability and a consumer protection point of view. For noncovered debt securities issued by banks in the Baltic countries, Italy, Austria and Germany, this share is par-

ticularly large. In this context, measures taken recently by ESMA to enhance obligations to provide information for clients are certainly welcome.

For Belgium, Spain, Finland, France, Ireland, Luxembourg and the Netherlands, the high share of OFI holdings in total euro area holdings of noncovered bank debt securities issued by their banks, coupled with a high share of non-home country euro area holdings in total euro area holdings and a high share of non-euro area holdings in most of these seven countries, suggest that any bail-in operations in these countries' banks would tend to burden their domestic economies only to a limited extent, apart from the caveat of possible adverse effects on pensioners via pension funds. By contrast, the home bias of euro area holdings is large in smaller countries as well as in Greece, Portugal and Italy and – to a somewhat lesser extent – in Germany, France and Spain. While for Germany, the implications of this finding are attenuated by the above-average share of non-euro area holdings, for Italy, the substantial home-bias of euro area holdings coupled with the low share of non-euro area holdings tend to make this country's domestic economy vulnerable to any bail-in operations for its banks.

Euro area holdings of bail-in-able debt securities issued by euro area banks on aggregate are concentrated on three countries (France, Germany, Italy) that account for 71% and on five coun-

tries (the top three plus Luxembourg and Ireland) that hold 85% of these debt securities.

Some euro area countries holding such debt securities, namely Italy and Austria as well as Greece, Luxembourg, France, Portugal and Spain, may be more affected by bail-in operations for euro area banks, given the size of these countries' holdings relative to their total financial assets: the former two because their euro area bank debt holdings are spread at significant levels across three holding sectors and the latter five because their euro area bank debt exposure is very high in one holding sector.

On aggregate, euro area banks have an outstanding volume of bail-in-able debt securities issues that considerably exceeds their holdings of bail-in-able debt securities issued by other euro area banks; such a net refinancing position of the banking sector (relative to its total financial assets) is particularly large in the Netherlands, Austria, Finland, France, Italy and Germany. Taking into account all (banking and other) euro area sectors' holdings of bail-in-able euro area bank debt securities, we find that non-euro area investors finance euro area banks by holdings of noncovered debt securities equal to about 1.5% of euro area banks' total financial assets. At the same time, however, euro area sectors may be assumed to hold nonnegligible volumes of noncovered debt securities issued by non-euro area banks.

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From low to negative rates: an asymmetric dilemma

Stefan Kerbl,
Michael Sigmund¹

With the expansionary monetary policy in several European countries continuing, the low interest rate environment is being increasingly replaced by a negative interest rate environment. We estimate a panel model to study the effects of prolonged low interest rates on banks in Austria. It shows that the profitability of banks declines in times of low interest rate environments. However, we are skeptical of extrapolating these findings to the negative environment. In a negative environment banks face an asymmetric dilemma: While the returns on many assets follow the decreasing reference rate (e.g. EURIBOR), costs of deposits are floored at zero and cannot follow this rate. In order to include this crucial nonlinearity and to estimate which banks are expected to suffer most, we amend our approach and employ an ARIMA model on a bank-by-bank basis. First, we find that small regional banks are hit hardest. These banks have a high share of deposits and are more sensitive to changes in the reference rates. Second, by only looking at data covering low interest rates (e.g. our panel approach) one would indeed underestimate the impact of negative rates on banks' profitability. Third, we find that a reference rate close to -2% would pose a substantial burden on banks' profitability. The approach assumes little adaptation of banks to these extreme environments and therefore highlights the importance of banks' adequate and timely reaction should interest rates continue to be negative.

JEL classification: G21, C22, C23

Keywords: bank profitability, low interest rate environment, negative interest rate environment, net interest margin, panel econometrics, ARIMA models

What is the effect of low interest rates on banks' profitability? While it is reasonable to assume that a flat yield curve puts pressure on banks' net interest income (for banks engaging in maturity transformation), the effect of a low interest rate level (i.e. a parallel movement of the yield curve) on a bank's net interest margin (NIM) is less clear. If the asset and liability sides of a bank are symmetrically affected by the parallel shift, then there will be no impact. However, recent studies, e.g. Claessens et al. (2016), Genay and Podjasek (2014) or Busch and Memmel (2015), show that the lower the interest rate environment is, the lower net interest income from banks is. This suggests that some liability positions do not react or react more sluggishly than the asset side to changes in the interest rate level.

The contribution of our paper concerning the low interest rate environment

is twofold. First, empirical studies show that there is substantial heterogeneity in the impact of the low interest rate environment on banks across jurisdictions (Claessens et al., 2016). Therefore, by analyzing the Austrian banking market, we add to these findings. Second, studies so far focused only on large international banks (Claessens et al., 2016; Borio et al., 2015) where data coverage is best. However, under the hypothesis that large banks typically have a greater ability to manage interest rate risks and can increase lending in foreign countries more easily (Claessens et al., 2016), smaller banks will be more affected by a low interest rate environment. We explicitly test this hypothesis in a panel econometric approach in section 2.

With the expansionary monetary policy in many countries continuing, the low interest rate environment is being increasingly replaced by a neg-

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ative interest rate environment. A number of countries or currency areas have introduced negative central bank deposit rates over the past few years: Denmark (July 2012), the euro area (June 2014), Switzerland (December 2014), Sweden (February 2015), Bulgaria (November 2015), Japan (January 2016) and Hungary (March 2016) (Scheiber et al., 2016). Similarly, the list of sovereign bonds trading at negative yields is growing. Bean et al. (2015) present a comprehensive background summary of these developments and the IMF (2015) provides a comparison of key related figures for several banking markets.

A central question is whether the insights gleaned from an analysis of the low interest rate environment can be extrapolated to a negative environment. While this depends on the legal setting of a country, we argue below that for Austria this is not the case and that negative interest rates are a game changer and have a profound impact on banks' profitability.

To see why the impact of a negative interest rate environment might differ from a low interest rate environment, consider the following basic banking model: A bank refinances itself at a reference rate (e.g. EURIBOR) plus an add-on (e.g. a spread depending on its credit quality). Let us call this sum "the total refinancing rate." The interest charged on its asset side is the total refinancing rate plus a surcharge to cover operational costs, (expected) risk costs and cost of equity (i.e. unex-

pected risk costs). The key issue of the current situation is that the refinancing rate of retail deposits is floored at zero, while this floor is not passed on to the asset side. This means that if market rates drop the asset side potentially follows suit and even drops into negative territory while the bank still pays for its refinancing. In other words: A negative interest rate environment causes the reference rate to be unrepresentative of the true refinancing rate of a bank. We see that the bank will suffer high losses if interest rates move far enough into negative territory and the bank holds deposits.

From a financial stability perspective, this risk is of high relevance as many financial institutions are exposed to it at the same time. We focus on the situation in Austria, where the zero floor on deposits rests on a Supreme Court decision.² Banks in other European countries face a similar situation (see e.g. Drescher et al. (2016) for the situation in Germany). On the asset side zero or negative rates are clearly relevant for sovereign bonds holdings, for interbank claims and – most crucially – also for customer loans typically tied to the EURIBOR. According to several court decisions³ a negative reference rate has to be passed on to the interest charged on customer loans.

In other words, banks experience a systemic mispricing of assets, not because the risk has been incorrectly assessed, but because the refinancing rate does not reflect the true conditions the bank faces once rates move into the negative.

² See court case decision 5 Ob 138/09v of the Supreme Court of Justice (October 13, 2009).

³ While total negative interest on customer loans is ruled out, negative reference rates need to be passed on until the total rate reaches zero (Oberlandesgericht Innsbruck, 4 R 58/16k, July 14, 2016, AK vs. Hypo Tirol). See also court case decisions dealing with Swiss franc-denominated foreign currency loans where the reference rate, CHF Libor, had already moved into negative territory at the end of 2014: Landesgericht Feldkirch (5 Cg 18/15z, August 28, 2015, VKI vs. Raiffeisenbank am Bodensee), Handelsgericht Wien (57 Cg 10/15v, September 24, 2015, VKI vs. Uni Credit BA) and Landesgericht Eisenstadt (27 Cg 32/15x, November 15, 2015, VKI vs. HYPO-BANK Burgenland). A case at the Supreme Court of Justice is currently pending.

This asymmetric dilemma is as new to banks as negative rates are to history.

To estimate banks' profitability under negative rates we use an ARIMA⁴ forecast modeling approach that is adjusted to account for the floor on deposits. This allows us to simulate banks' profitability under hypothetical negative rates (section 3) and the assumption that banks do not adjust their product pricing substantially.

Importantly, we do not intend to make a judgment on monetary policy by conducting these simulations as we take a narrow look at the effect of interest rates whilst monetary policy must be based on a comprehensive view of the transmission mechanism. In addition, banks' reactions to negative rates will be more dynamic (e.g. adjusting fees for certain products) than assumed here.

1 Low interest rate environment: a panel econometric approach

In this section we estimate the effect of changes in the interest rate environment on the NIM of banks by employing a panel econometric approach. The NIM is the main source of income for Austrian banks accounting for around two-thirds of their total earnings.

1.1 The data

Our empirical analysis is based on quarterly unconsolidated supervisory data reported by domestically operating banks according to national Generally Accepted Accounting Principles (GAAP). A considerable advantage compared to other studies is that our dataset features all banks in Austria, small or large, whereas other studies typically over-

sample large banks for data availability reasons.

Bank-specific variables are built using data from balance sheet items, the profit and loss statement and data on regulatory capital and capital requirements. The observation span runs from the first quarter of 1998 to the first quarter of 2016, yielding $T=73$ time periods. We consider all institutions that held a banking license at some point during the sample period, but exclude special purpose banks and affiliates of foreign banks in Austria, thus arriving at a sample of $N=946$ banks.

As control variables we use a wide set of bank-specific and macroeconomic variables (see table 1). Macroeconomic data are taken from the OeNB's macroeconomic dataset. To prevent outliers from distorting the empirical analysis, we apply a two-stage cleaning algorithm to the variables used. First, we eliminate outliers across banks for each time period. An observation is considered an outlier if it is too far from the median (more than four times the distance between the median and the 2.5% or 97.5% quantile). In a second stage, we eliminate outliers across time for each bank. Here, the threshold distance is defined as 12 times the distance between the median and the 10% or 90% quantile.⁵ Such parameters ensure that the number of removed observations remains limited and the resulting distributions exhibit a reasonable shape when judged from a qualitative perspective. This procedure eliminates 0.77% of observations that are considered as reporting errors and leaves us with around 48,000 observations.

⁴ ARIMA stands for autoregressive integrated moving average.

⁵ This procedure was not invented for this exercise but is an established good practice used to remove reporting errors in the regulatory reporting system in many supervisory applications relying on regressions (Gunter et al., 2013).

1.2 The model

To assess the average effect of the interest rate level on a bank's interest margin we employ a static one-way panel regression that reads as follows:

$$y_{i,t} = \alpha + \beta' X_{i,t} + u_i + e_{i,t}; \quad (1)$$

$$i = 1, \dots, N; \quad t = 1, \dots, T,$$

where $y_{i,t}$ denotes the dependent variable (NIM), $X_{i,t}$ the K explanatory variables and $e_{i,t}$ the idiosyncratic error term. α in equation 1 represents the global intercept, β' the K regression coefficients of the explanatory variables and u_i the bank-specific effect. We chose the specification after running a set of statistical tests (see annex B) and building on the previous

Table 1

Description of variables

Name	Description	Normalized by total assets	Expected sign on NIM
Dependent variable:			
NIM	Net interest income over total assets	by definition	n.a.
Explanatories of particular interest:			
EURIBOR	Short-term nominal interest rate (3-month EURIBOR) p.a.	no	+
EURIBOR ²	EURIBOR squared (but with the sign kept)	no	±
Term spread	10-year Austrian government bond yield minus short-term interest rate	no	+
Interaction: EURIBOR x RBD	Interaction effect including regional bank dummy (see below)	no	+
Bank-level control variables:			
RBD	Regional bank dummy: 1 if at least one branch per EUR 25 million of total assets and at least 60% of deposits financed, otherwise 0.	no	+
Total assets	log of total assets	no	±
Euro loans to domestic customers	Loans to domestically domiciled nonbanks (i.e. customers) in euro	yes	+
FX loans to domestic customers	Loans to domestically domiciled nonbanks (i.e. customers) in currencies other than euro	yes	+
Loans to foreign customers	Loans to foreign domiciled nonbanks (i.e. customers)	yes	+
Interbank loans	Loans to domestic and foreign banks, all currencies	yes	+
Interest-bearing securities	Exchange-traded interest-bearing securities (held as assets) issued by domestic and foreign banks and nonbanks	yes	+
Nonbank deposits	Deposits taken from domestic and foreign nonbanks (i.e. customers)	yes	-
Bank deposits	Deposits taken from domestic and foreign banks, all currencies	yes	-
Securitized debt	Liabilities in the form of securitized debt obligations and transferable certificates	yes	-
Net fee income	Net fee and commission income	yes	-
Staff expenses	Staff expenses	yes	+
Other administrative expenses	Administrative expenses other than staff expenses	yes	+
RWAs to total assets	Average risk-weight (credit risk only)	by definition	±
LLP ratio	Specific loan loss provisions over gross exposure (loans to domestic and foreign nonbanks)	no	±
Macroeconomic control variables:			
GDP growth	Annual growth of quarterly real GDP	no	+
Unemployment growth rate	Harmonized unemployment growth rate	no	-

Source: OeNB.

Note: Theoretical considerations and/or evidence in the existing literature suggest that the impact of a variable on the NIM is either positive (+), negative (-) or mixed (±).

work of Gunter et al. (2013). In this notation, $X_{i,t}$ includes explanatory variables of particular interest, bank-level control variables and macro-economic control variables (see table 1).

1.3 The results

Table 2 displays the coefficient estimates of the panel model. For brevity, we will focus here on the regressors that are of interest to us. Our results suggest that a drop of 1 percentage point in the EURIBOR is on average associated with a drop in the NIM of around 15 basis points. However, the nonlinear term is also highly significant and negative: The higher the EURIBOR rate, the less effect a change in interest rate levels has on the NIM. This pronounced nonlinearity effect is in line

with the findings of Borio et al. (2015) and Claessens et al. (2016) and is also depicted in chart 1.

Furthermore, the model output suggests that a 1 percentage point decrease in the difference between long and short rates, i.e. a flattening of the yield curve, causes the NIM to drop by 11 basis points. While regional banks have on average a higher NIM (by 10 basis points), they are more affected by changes in market rates, although only slightly, i.e. by +1.7 basis points compared to other banks. That smaller banks are more strongly affected is in line with the findings of Genay and Podjasek (2014). See annex C for a discussion on the regression coefficients that are not directly connected with the interest rate level.

Table 2

Panel estimation result: coefficients and robust standard errors

	Coefficients	(Standard errors)
EURIBOR	0.164	(0.005)***
EURIBOR ²	-0.003	(0.001)**
Term spread	0.115	(0.003)***
Interaction: EURIBOR x RBD	0.017	(0.003)***
RBD	0.098	(0.010)***
Total assets	-0.400	(0.009)***
Euro loans to domestic customers	4.270	(0.042)***
FX loans to domestic customers	3.312	(0.067)***
Loans to foreign customers	3.770	(0.061)***
Interbank loans	2.719	(0.041)***
Interest-bearing securities	3.398	(0.046)***
Nonbank deposits	-1.571	(0.054)***
Bank deposits	-1.875	(0.057)***
Securitized debt	-1.892	(0.092)***
Net fee income	-0.036	(0.003)***
Staff expenses	-0.083	(0.024)***
Other administrative expenses	0.162	(0.011)***
RWAs to total assets	0.215	(0.016)***
LLP ratio	-2.558	(0.087)***
GDP growth	0.020	(0.001)***
Unemployment growth rate	0.001	(0.000)***
R ²	0.550	
Adj. R ²	0.540	
Number of observations	47,980	

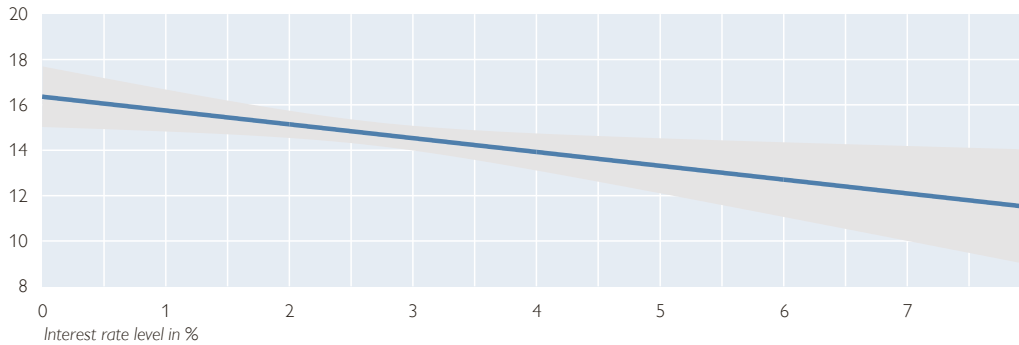
Source: OeNB.

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. The dependent variable, NIM, is in percentage points.

Chart 1

Estimated effect of a 100 basis point NIM change depending on the interest rate environment

Change in net interest margin in basis points



Source: OeNB.

Note: Shaded areas represent 95% confidence bands using robust errors.

2 From low to negative rates

2.1 Why negative rates are a game changer

Can the results from the previous section be extrapolated to negative market rates? As argued in the introduction, we are skeptical of this: The floor on deposit rates constitutes a nonlinearity that the panel approach of section 1 does not take into account. In nontechnical terms, these floors are invisible to the model as negative rates have not yet been observed in history.⁶ We therefore outline below an approach which is suited to address this nonlinearity.

2.2 The approach

To simulate hypothetical negative rates for each bank we estimate a set of separate econometric models: one for each bank and profit and loss (P&L) item. This is necessary to account for the floor on deposits. A drawback of such a high number of models is that each one uses only a small dataset; a merit thereof is that it allows for bank-specific sensitivities to changes in the

interest rate level. Bank-by-bank results that pay heed to the individual portfolio sensitivity of banks mean that these results can also be included in top-down stress tests. Additionally and most importantly, we can restrict the forecast for those P&L items with a legal floor to zero and thereby simulate the effect of interest rates never before visited in history.

Using the regulatory reporting system containing detailed P&L statements for each bank and quarter, we forecast these individual P&L items with an ARIMA($p_{i,j}$, $d_{i,j}$, $q_{i,j}$) time series model:

$$\begin{aligned} \varphi(B)(1-B)^{d_{i,j}}(y_{t,i,j} - \mu_{i,j}) &= \\ &= \theta(B)\varepsilon_{t,i,j}, \end{aligned} \quad (2)$$

where $\{\varepsilon_{t,i,j}\}$ is a white noise process with mean zero and variance $\sigma_{i,j}^2$, B is the back-shift operator, $\varphi(z)$ and $\theta(z)$ are polynomials of order $p_{i,j}$ and $q_{i,j}$ respectively, and $y_{t,i,j}$ is the P&L item i of bank j at time t with mean $\mu_{i,j}$.

⁶ The recent rates were observed over too short a period and are too close to zero to provide a reliable statistical estimate.

For P&L items that are sensitive to interest rates (see table 3 for an overview)⁷ we add the exposure specific to that item⁸ times the EURIBOR rate as an exogenous regressor, so that the model becomes

$$\begin{aligned} (1-B)^{d_{ij}}(y_{t,i,j} - \mu_{i,j}) &= \\ &= \gamma'_{i,j} (Euribor_t Exp_{t,i,j}) + \\ &+ \gamma''_{i,j} (Euribor_{t-1} Exp_{t,i,j}) + \eta_{t,i,j} \end{aligned} \quad (3)$$

$$\varphi(B)\eta_{t,i,j} = \theta(B)\varepsilon_{t,i,j} \quad (4)$$

$\gamma'_{i,j}$ and $\gamma''_{i,j}$ are coefficients measuring the sensitivity of income or expenses to the interest rate level. Economically, these coefficients measure how fast reference rates are passed on to the banks' creditors and debtors. Once again, a subset of these positions, interest expenses on deposits, is floored at zero. To include this legal situation in the model, we replace $y_{t,i,j}$ by $\max(0, y_{t,i,j})$ if i is the cost of deposits (table 3). This restriction is important when we use the ARIMA models for forecasting under varying scenarios (see below).

In other words, the approach outlined above models the interest-sensitive P&L items of each bank as a function of the interest rate level times the exposure to that item. For instance, interest income from mortgage loans depends on the size of the mortgage portfolio times the current reference rate (captured above by $\gamma'_{i,j}$ where i would correspond to the P&L item "income from mortgage loans"). As many loan contracts stipulate a slower reaction of

rates charged than changes in the reference rate, we also add the lagged reference rate times the (current) exposure to that item (captured above by $\gamma''_{i,j}$). We know that there are numerous other factors which influence revenues and expenses that differ from P&L item to item and from bank to bank. Consequently, we need to model the error term in a flexible function of its own past values (the AR-component, $\varphi(B)$) and recent shocks (the MA-component, $\theta(B)$).

To estimate the effect of negative rates on banks' profits, we proceed as follows: First, we estimate for each bank and P&L item an ARIMA model as described above. The order of the polynomials is chosen by following Hyndman and Khandakar (2008). Second, we use the model for forecasting eight quarters into the future while holding the exposure constant ("constant balance sheet assumption") but varying the reference rates. For the reference rate we use three scenarios. Scenario(-1) assumes a drop in the reference rate to -1%, Scenario(-2) explores the consequences of an extremely negative reference rate of -2%. Scenario(+1), used for comparison purposes, calculates banks' profitability under a reference rate of +1%.⁹ Third, we reconstruct the main positions (especially net interest income and earnings before risk costs and taxes) by aggregating over the individual positions and present the results for each banking sector. The sectors we use and key summary statistics are displayed in table 4.

⁷ Actually, the P&L structure we use is much finer, differentiating e.g. between foreign-currency and euro amounts for many items, but table 3 captures the essence.

⁸ The regulatory reporting system provides for each interest-bearing P&L item the asset or liability value associated with generating this income or expense, a feature that notably distinguishes our database from others.

⁹ In all three scenarios the reference rate does not vary over the eight-quarter forecast horizon.

Table 3

P&L items used in the ARIMA approach

P&L item	Separate ARIMA model	Interest rate-sensitive	Floored at zero
1. Interest income			
Interest income from interbank loans	yes	yes	
Interest income from nonbank customer loans	yes	yes	
Interest income from bonds	yes	yes	
Interest income from other	yes	yes	
2. Interest expenses			
Interest expenses from interbank loans	yes	yes	
Interest expenses from nonbank customer deposits	yes	yes	yes
Interest expenses from bonds issued	yes	yes	
Interest expenses from other	yes	yes	
3. Net interest income (1+2)			
4. Income from equity positions	yes	yes	
5. Fee and commission income	yes		
6. Fee and commission expenses	yes		
7. Net income from other financial transactions	yes		
8. Other income	yes		
9. Administrative expenses	yes		
10. Other expenses	yes		
11. Earnings before risk costs and taxes (3+4+5+6+7+8+9+10)			

Source: OeNB.

Table 4

Key statistics by banking sector

Sector	Total assets (EUR million)	Deposit share (% of total assets)	Loans to customers (% of total assets)	Net interest income (% of total earnings)	Net interest margin (% of total assets)
Car finance banks	708.75	63.79	78.37	59.04	2.32
Branches	494.48	50.37	31.60	30.12	0.88
Building and loan associations and housing banks	3,300.88	33.86	41.45	96.42	0.72
Large banks	33,009.89	34.63	34.43	32.88	0.72
Medium universal banks	5,802.67	52.19	70.62	66.96	1.65
Private stock banks	697.91	70.81	27.22	17.84	0.78
Raiffeisen credit cooperatives	258.18	79.30	58.92	64.57	1.80
Savings banks	1,349.13	72.18	67.82	60.84	1.69
Special purpose financial institutions	2,487.84	26.37	52.88	42.77	1.07
Volksbank credit cooperatives	705.71	79.07	68.33	60.98	1.86

Source: OeNB.

Note: Mean figures across banks and the last eight quarters.

2.3 The results

Table 5 depicts the NIM for banks under the scenarios considered. Looking at the last two columns of the table, $\Delta(-1)$ and $\Delta(-2)$, we see that negative reference rates would have a profound impact on banks' profitability. Under

a reference rate of -1% this impact ranges from (a median of) -43.4 basis points for Volksbank credit cooperatives to -5.8 basis points for large banks. Under the extreme assumption of a reference rate of -2% , the impact is generally scaled by a factor larger than

2, ranging from -90.6 basis points to -11.6 basis points. Looking at the last row, “all banks,” we see that in case of a reference rate of -2% , the median NIM is 98.6 basis points or -66.7 below current levels. While this is a substantial decline, the NIM remains fairly positive under this extreme reference rate and the assumption (which the model automatically makes) that there is little adaptation from the banks’ side.

Let us compare the model outcome with that of section 2, which estimated a 16.4 basis point rise in the NIM when reference rates increase by 100 basis points (at current levels). The model employed here comes to a very similar estimate ($+19.2$ basis points for an increase of 119 basis points,¹⁰ see the last row of table 5). However, the panel model of section 2 did not take the nonlinear floor on deposits into consideration – which is irrelevant in a normal interest rate environment. The panel model’s estimate was a symmetrical one: It also predicted a 16.4 basis

point drop in the NIM when reference rates decrease by 100 basis points. This is where the models disagree. The ARIMA approach employed in this section, which takes the floor on deposits into account, paints a more meager picture of the profitability of banks under a scenario of negative rates. It predicts a decline of -29.8 basis points in the NIM if reference rates drop to -1% and of -66.7 basis points if they drop to -2% , substantially more than predicted without taking the floor on deposits into account.

Concerning banking sectors, there are two clusters in the results: Large banks, building and loan associations and housing banks, and private stock banks are hit less hard, while in all other banking sectors the NIM decreases more substantially. Large banks hold a lower share of deposits, are more strongly financed through interbank liabilities and issued bonds and are better hedged against interest rate movements. Also, the share of equity positions on the asset

Table 5

Net interest margin by banking sector across scenarios

Sector	Realized	Scen.(+1)	Scen.(−1)	Scen.(−2)	Δ (+1)	Δ (−1)	Δ (−2)
	<i>Basis points</i>						
Volksbank credit cooperatives	176.9	194.3	133.5	86.3	17.4	−43.4	−90.6
Car finance banks	244.9	247.1	212.3	173.9	2.3	−32.6	−71.0
Raiffeisen credit cooperatives	170.8	189.6	141.0	104.8	18.8	−29.8	−66.0
Savings banks	161.8	184.8	137.4	99.2	23.0	−24.4	−62.5
Medium universal banks	153.5	151.8	122.2	95.4	−1.7	−31.4	−58.2
Special purpose financial institutions	110.1	103.7	76.5	53.5	−6.4	−33.6	−56.6
Branches	64.5	65.2	26.1	10.7	0.8	−38.4	−53.7
Private stock banks	59.6	110.3	43.4	27.5	50.8	−16.1	−32.0
Building and loan associations and housing banks	58.8	54.7	44.5	38.8	−4.1	−14.4	−20.0
Large banks	79.2	113.1	73.4	67.6	33.9	−5.8	−11.6
All banks	165.3	184.5	135.5	98.6	19.2	−29.8	−66.7

Source: OeNB.

Note: “Realized” is the average of the last four quarters, “Scen.” denotes the three scenarios and Δ denotes differences between scenario and realized values. Medians for each sector. The sectors are listed in ascending order according to the values provided in the last column.

¹⁰ The last EURIBOR rate used in the model is -0.19% for Q1 2016.

side is considerably larger. For building and loan associations and housing banks, their main asset class – building loans – benefits from a contractual interest rate floor of 3%, rendering this sector only slightly sensitive to negative rates.¹¹ Private stock banks have a stronger focus on private wealth management and are therefore less dependent on deposit financing. As a result, they are less exposed to the asymmetric dilemma. For all the other sectors these arguments are not valid. Thus, the impact on these sectors is much stronger.¹²

Smaller banks focusing on the regional retail banking business, such as Volksbank credit cooperatives, savings banks and Raiffeisen credit cooperatives, are hit hardest. Somewhat surprisingly, the car finance sector also appears among those sectors that are strongly impacted by negative rates. Looking at the data we see that this sector's asset side reacts more to changes in the reference rate implying a strong contractual link between the

reference rate and the interest charged. If we compare the ranking of sectors in the last two columns, we see some differences, but the two clusters (the bottom three sectors and the rest) are still very distinct.

As a consequence, the effects driving the results for any single bank are a combination of (1) how responsive the asset side is to changes in the reference rate and (2) how much of the liability side is floored at zero. Both factors can be influenced in a number of ways, e.g. by whether the asset side structure has a higher share of equities or other assets like real estate, whether interest rate hedges like swaps or interest rate floors (e.g. as for building societies) are in place etc. Given the distance between current reference rates (–0.19% for Q1 2016) and the extreme (–2%) simulated above, banks will have time to adapt as conditions change. Of course it is difficult to simulate such adaptive behavior on the banks' side. This is why the “constant

Table 6

Return on assets before risk costs and taxes by banking sector

Sector	Realized	Scen.(+1)	Scen.(–1)	Scen.(–2)	Δ (+1)	Δ (–1)	Δ (–2)
<i>Basis points</i>							
Volksbank credit cooperatives	31.6	23.0	–40.1	–88.3	–8.6	–71.8	–119.9
Branches	54.4	48.5	–6.5	–27.0	–5.9	–61.0	–81.5
Raiffeisen credit cooperatives	69.5	86.3	36.1	–2.5	16.8	–33.4	–71.9
Savings banks	78.0	102.0	52.4	13.5	24.1	–25.5	–64.5
Medium universal banks	75.3	90.7	42.6	16.3	15.4	–32.7	–59.0
Private stock banks	15.1	64.1	12.7	–34.2	49.0	–2.4	–49.4
Special purpose financial institutions	106.6	137.3	83.9	69.5	30.7	–22.7	–37.1
Car finance banks	69.6	136.5	76.3	34.1	66.9	6.7	–35.5
Building and loan associations and housing banks	15.6	9.7	9.4	5.2	–5.9	–6.2	–10.3
Large banks	72.6	115.4	91.0	62.6	42.8	18.4	–10.0
All banks	65.6	86.6	36.8	–0.6	21.1	–28.8	–66.2

Source: OeNB.

Note: “Realized” is the average of the last four quarters, “Scen.” denotes the three scenarios and Δ denotes differences between scenario and realized values. Medians for each sector. The sectors are listed in ascending order according to the values provided in the last column.

¹¹ However, the floor, together with low or negative reference rates, is likely to trigger a reduction in volume as the product becomes less competitive. Due to the constant balance sheet assumption employed here, this effect is not captured.

¹² The special purpose financial institutions sector is a zoo of very different animals, including bad banks, credit card companies and factoring banks, which is why we do not discuss this catch basin in detail.

balance sheet assumption” is applied (see section 2.2), which ignores banks’ adaptation behavior. As a consequence, the results presented here can be understood as a particularly severe case, that is an extreme reference rate and without adaptive behavior.

The asymmetric dilemma responsible for squeezing the NIM is also depicted in chart 2, which shows that while deposit costs have reached a level close to zero (long-term deposits keep the costs above zero) and would not fall if the reference rate were to drop further into negative territory, the yield on customer loans would follow the reference rate and decrease further. Although the yield on customer loans would remain positive it would not be sufficient to cover costs for the majority of banks.

This is also shown in table 6, which depicts the return on assets (before risk costs and taxes)¹³ in basis points for all sectors and across scenarios.¹⁴ The major difference between this indicator and the NIM shown in table 5 is that income from equity exposure, net fee and commission income, administrative expenses and other income and expenses are considered. In total (last row of table 6) the impact in all three considered scenarios is very similar to that for the NIM with a deviation of only a few basis points. Individual sectors are hit harder, e.g. branches, or less hard, e.g. the car finance sector. However, as the additional P&L items that are considered in the calculation of return on assets are prone to one-off effects that

make forecasting difficult, we focus on the NIM result.

3 Summary and conclusions

In this paper we analyze the effects of low and negative rates on the profitability of Austrian banks. We found that a bank’s NIM is linked to the interest rate environment. The link is strong when reference rates are close to zero (at around 16 basis points per 100 basis points) but – due to nonlinearities – subdued in normal times. Smaller, regional banks are affected more, but this does not trigger a considerable economic impact.

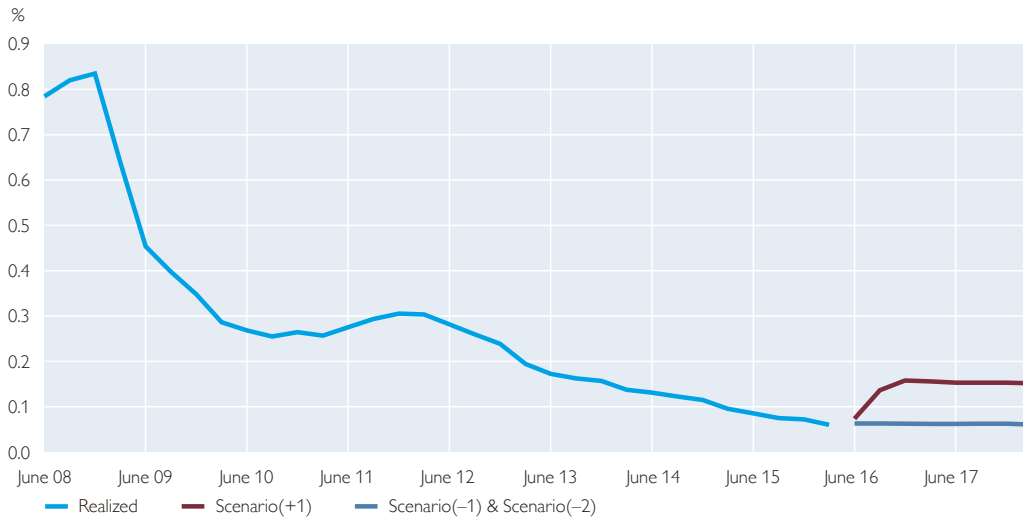
While the above is expected in an environment of low and zero rates, we are skeptical of extrapolating these findings to negative rates. To better investigate negative rates we employ an ARIMA simulations approach that takes into account the asymmetric dilemma that deposit rates are legally floored at zero while loan rates directly track reference rates. Using such an approach, we find that negative rates can create a substantial burden on the profitability of banks and that smaller deposit-financed banks, in particular, are hit hardest. This finding is important as these banks often do not participate in empirical studies due to a shortage of data. Simulations of reference rates of -2% show that under such extreme conditions and assumptions, the profits of a large part of the banking system would be eroded, but median NIM would remain in positive territory.

¹³ Position 11 in table 3 divided by total assets.

¹⁴ Risk costs in the P&L statements are not available on a quarterly basis.

Chart 2a

Deposit costs

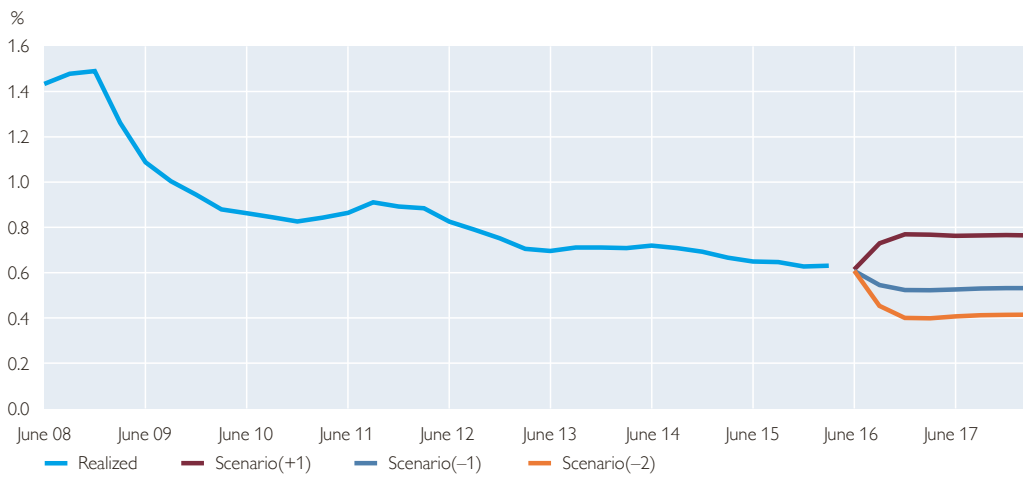


Source: OeNB.

Note: Values in % of volumes over time. Median across all banks.

Chart 2b

Yields on customer loans



Source: OeNB.

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Annex A Summary statistics

Table A1

Descriptive statistics

	Min.	Q1	Median	Mean	Q3	Max.	StD	Data C.
NIM	-3.04	1.64	2.08	2.11	2.59	13.84	0.79	80%
EURIBOR	-0.19	0.72	2.15	2.29	3.59	5.03	1.60	100%
EURIBOR ²	-0.03	0.52	4.62	7.83	12.89	25.3	7.77	100%
Term spread	-0.41	0.77	1.41	1.33	1.99	2.99	0.83	100%
Interaction: EURIBOR x RBD	-0.19	0.00	0.00	0.47	0.00	5.03	1.20	99%
RBD	0.00	0.00	0.00	0.18	0.00	1.00	0.39	99%
Total assets	5.64	10.77	11.56	11.74	12.41	18.87	1.48	80%
Euro loans to domestic customers	0.00	0.39	0.49	0.48	0.59	1.00	0.17	80%
FX loans to domestic nonbanks	0.00	0.01	0.04	0.07	0.09	0.65	0.08	79%
Loans to foreign customers	0.00	0.00	0.01	0.03	0.02	1.00	0.09	78%
Interbank loans	0.00	0.14	0.20	0.23	0.29	1.00	0.14	80%
Interest-bearing securities	0.00	0.02	0.07	0.09	0.14	1.00	0.09	79%
Nonbank deposits	0.00	0.70	0.79	0.74	0.85	1.00	0.19	80%
Bank deposits	0.00	0.03	0.07	0.11	0.15	1.00	0.13	78%
Securitized debt	0.00	0.00	0.00	0.02	0.00	1.00	0.08	79%
Net fee income	-9.61	0.50	0.65	0.88	0.80	85.03	2.69	80%
Staff expenses	0.00	1.00	1.00	0.94	1.00	1.00	0.17	80%
Other administrative expenses	0.00	0.55	0.70	0.70	0.87	1.00	0.21	80%
RWAs to total assets	0.00	0.48	0.57	0.57	0.67	7.34	0.18	80%
LLP ratio	0.00	0.03	0.04	0.05	0.06	0.71	0.03	79%
GDP growth	-4.71	0.70	1.84	1.68	3.08	4.10	1.78	100%
Unemployment growth rate	-24.18	-8.13	3.10	1.84	7.74	39.34	12.49	100%

Source: OeNB.

Note: Data C. defines the percentage of available data (sample period Q1 1998 to Q1 2016 using data from 946 banks). The other columns refer to sample statistics. EURIBOR, long-term interest rates (part of the term spread), the NIM and net fee income are annualized rates. Staff expenses and other administrative expenses are expressed as yearly costs divided by total assets. Euro loans to domestic nonbanks, FX loans to domestic nonbanks, interbank loans, interest-bearing securities, bank deposits, nonbank deposits, securitized debt, risk-weighted assets (RWAs), the leverage ratio and the LLP ratio are defined as annual rates. GDP growth and unemployment growth rate are defined as the year-on-year growth rate of real GDP and of the unemployment rate, respectively. See also table 1.

Annex B

Econometric considerations for choosing the panel model approach

The Breusch-Pagan Lagrangian multiplier test for random effects supports the use of a panel estimator as it rejects the null of poolability at the 1% level, thereby underlining the importance of taking the presence of any type of bank-specific effect into account. Moreover, the Wooldridge test for autocorrelation in panel data rejects the null of no first-order autocorrelation in the idiosyncratic error terms at the 1% level (see Wooldridge, 2002; Drukker, 2003). A modified Wald test for groupwise heteroskedasticity likewise rejects the null of homoskedasticity of the idiosyncratic error variances at the 1% level. When autocorrelation and heteroskedasticity appear in panels, we have to make a more general assumption about the distribution of the error term and thus employ robust estimators of the variance-covariance matrix.

To make a decision on whether to use fixed or random effects we proceeded as follows: As we are confronted with heteroskedasticity in the error variance, we need a variant of the Hausman test that is robust against heteroskedasticity. We therefore employ the Hansen (1982) *J* test of overidentifying restrictions, which tests whether the additional moment condition of the explanatory variables being uncorrelated with the panel-specific effects (as imposed by random effects estimation) holds (see Arellano, 1993). As the null of the test of validity of this particular overidentifying restriction is rejected at the 1% level, we conclude that a model with fixed effects better describes the underlying data-generating process.

We chose a static model, i.e. we chose not to include a lagged dependent variable due to (i) the potentially large

consequential bias documented by Achen (2001) and Keele and Kelly (2006) and (ii) the bias documented by Nickell (1981). In addition, it is not clear why the lagged NIM should have a causal relationship to the current one. Ignoring these arguments and including a lagged dependent variable would reduce all estimated coefficients reported in table 2 by around a third to a half. Significance levels are maintained and the only sign switch is EURIBOR². We think that these consequences perfectly fit the symptoms of a substantial bias (Achen, 2001) and therefore do not consider these results further.

Annex C

Interpretation of regression coefficients

Here we discuss in more detail those results of the regression presented in table 2 that do not have a direct connection to the interest rate level. In general, the results are in line with expectations. Banks engaging in riskier lending as indicated by the RWA density tend to have a higher NIM, as do smaller banks and banks with higher nonstaff administrative costs. When risks materialize, banks have to book loan loss provisions and also face nonperforming loans, which, in consequence, lowers the NIM. Several regressors describe the composition of the asset or liability side and some explanation is required here: To understand why the fraction of interbank loans on the asset side has a positive contribution to the NIM when these positions are generally considered to yield lower interest than other asset side positions, note that this is the case here too. Interbank loans show a positive contribution to the NIM but their contribution is less than the one from loans to customers. The reason why the coefficient is positive (and not negative) is that interbank

loans contribute (little but positively) to the net interest income while other asset side positions yield even less or no interest (e.g. exposure to sovereigns, buildings, intangible assets). The same holds true for the liability side where deposits – while being less expensive¹⁵ than e.g. securitized debt – still reduce the NIM of a bank compared to liability positions not included in the regression e.g. equity. Staff expenses show a negative sign, which we think is caused by banks engaging in fee, commission and wealth management activities or trading that

tend to have high staff expenses but a low NIM. The only surprising sign is the one on the unemployment growth rate, implying a higher NIM when unemployment grows. We think that this must be understood in connection with the coefficient on GDP growth, which shows a higher NIM in times of growth. Why – controlling for GDP growth and loan loss provisions – unemployment growth is positively associated with the NIM is not clear. However, while the coefficient is statistically significant, it is not so economically.

¹⁵ Note that this comparison takes only the interest expenses into account and not other costs e.g. branch networks.

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Annex of tables

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Cutoff date for data: November 10, 2016

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 financial market indicators

Table A1

Short-term interest rates¹

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>Three-month rates, period average, %</i>								
Euro area	0.81	1.39	0.57	0.22	0.21	-0.02	0.02	-0.22
U.S.A.	0.34	0.34	0.43	0.27	0.23	0.32	0.27	0.63
Japan	0.39	0.34	0.33	0.24	0.21	0.17	0.17	0.10
United Kingdom	0.74	0.88	0.86	0.50	0.54	0.55	0.54	0.56
Switzerland	0.19	0.12	0.07	0.02	0.01	-0.75	-0.75	-0.75
Czech Republic	1.31	1.19	1.00	0.46	0.36	0.31	0.32	0.29
Hungary	5.51	6.19	6.98	4.31	2.41	1.61	1.86	1.21
Poland	3.92	4.54	4.91	3.02	2.52	1.75	1.77	1.68

Source: Bloomberg, Eurostat, Thomson Reuters.

¹ Average rate at which a prime bank is willing to lend funds to another prime bank for three months.

Table A2

Long-term interest rates¹

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>Ten-year rates, period average, %</i>								
Euro area	3.78	4.31	3.05	3.01	2.28	1.27	1.22	0.98
U.S.A.	3.20	2.77	1.79	2.34	2.53	2.13	2.06	1.83
Japan	1.17	1.12	0.85	0.71	0.55	0.36	0.37	-0.03
United Kingdom	3.36	2.87	1.74	2.03	2.14	1.79	1.69	1.45
Switzerland	1.63	1.47	0.65	0.95	0.69	-0.07	0.01	-0.37
Austria	3.23	3.32	2.37	2.01	1.49	0.75	0.57	0.47
Czech Republic	3.88	3.71	2.78	2.11	1.58	0.58	0.50	0.46
Hungary	7.28	7.64	7.89	5.92	4.81	3.43	3.38	3.26
Poland	5.78	5.96	5.00	4.03	3.52	2.70	2.52	3.00

Source: ECB, Eurostat, Thomson Reuters, national sources.

¹ Yields of long-term government bonds.

Table A3

Stock indices

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>Annual change in %, period average</i>								
Euro area: EURO STOXX	13.38	-3.60	-6.36	17.53	13.07	11.76	12.84	-12.26
U.S.A.: S&P 500	20.24	11.27	8.74	19.14	17.58	6.70	11.55	-3.40
Japan: Nikkei 225	7.22	-5.94	-3.37	48.80	14.22	23.83	29.11	-12.56
United Kingdom: FTSE 100	19.76	3.90	0.96	12.75	3.24	-1.35	2.03	-11.04
Switzerland: SMI	14.27	-6.96	4.88	24.14	9.26	4.28	6.60	-11.07
Austria: ATX	19.85	-3.69	-14.79	16.94	-2.36	1.29	-2.97	-10.19
Czech Republic: PX 50	21.72	-5.11	-14.56	2.53	1.62	0.81	0.06	-12.42
Hungary: BUX	40.13	-8.67	-12.02	3.26	-3.89	17.28	8.93	27.78
Poland: WIG	33.55	4.36	-6.66	16.07	8.06	-0.31	4.07	-14.83

Source: Thomson Reuters.

Table A4

Corporate bond spreads¹

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>Percentage points, period average</i>								
Euro area								
AA	1.33	1.90	1.47	0.89	0.61	0.72	0.61	0.87
BBB	2.95	3.75	3.56	2.25	1.73	1.90	1.70	2.29
U.S.A.								
AA	1.32	1.68	1.50	1.12	0.88	1.04	0.95	1.02
BBB	2.21	2.34	2.59	2.17	1.76	2.13	1.96	2.49

Source: Thomson Reuters.

¹ Spreads of seven- to ten-year corporate bonds against ten-year government bonds (euro area: German government bonds).

Financial indicators of the Austrian corporate and household sectors

Table A5

Financial investment of households¹

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>EUR billion, four-quarter moving sum</i>								
Currency	1.0	1.1	0.6	1.2	0.8	0.9	1.0	0.7
Deposits	1.6	4.6	3.8	1.9	3.2	6.5	6.0	8.8
Debt securities ²	1.5	1.8	0.2	-1.8	-4.2	-3.5	-5.4	-2.1
Shares and other equity ³	1.7	0.8	1.1	-0.1	1.9	-0.3	0.6	1.6
Mutual fund shares	2.4	-1.4	0.9	2.7	3.5	4.1	4.5	2.9
Insurance technical reserves	3.7	2.1	2.7	2.4	2.2	0.4	0.6	0.2
Other accounts receivable	0.7	1.0	1.0	1.0	2.9	1.9	1.0	0.9
Total financial investment	12.6	10.0	10.3	7.3	10.3	10.0	8.3	1.3

Source: OeNB (financial accounts).

¹ Including nonprofit institutions serving households.

² Including financial derivatives.

³ Other than mutual fund shares.

Table A6

Household¹ income and savings

	2008	2009	2010	2011	2012	2013	2014	2015
<i>EUR billion, four-quarter moving sum</i>								
Net disposable income	171.6	171.9	172.9	177.9	184.7	185.1	188.9	191.9
Savings	20.7	19.5	16.2	14.1	16.1	13.1	13.3	14.2
Saving ratio in % ²	11.9	11.3	9.3	7.9	8.7	7.0	7.0	7.3

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

¹ Including nonprofit institutions serving households.

² Saving ratio = savings / (disposable income + increase in accrued occupational pension benefits).

Table A7

Financing of nonfinancial corporations

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>EUR billion, four-quarter moving sum</i>								
Debt securities ¹	1.4	4.2	2.8	1.7	-0.7	0.0	-1.7	2.3
Loans	5.8	6.4	4.5	1.7	1.1	5.4	-0.2	3.9
Shares and other equity	0.4	9.6	2.3	4.5	4.0	4.2	6.6	3.5
Other accounts payable	5.9	3.4	1.1	2.8	3.2	4.0	3.7	4.8
Total external financing	13.5	23.6	10.7	10.7	7.6	13.7	8.3	14.6

Source: OeNB (financial accounts).

¹ Including financial derivatives.

Table A8

Insolvency indicators

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
Default liabilities (EUR million)	4,700	2,775	3,206	6,255	2,899	2,430	828	1,800
Defaults (number)	3,522	3,260	3,505	3,266	3,275	3,115	1,520	1,625

Source: Kreditschutzverband von 1870.

Note: Default liabilities for 2013 include one large insolvency.

Table A9

Housing market indicators

	2010	2011	2012	2013	2014	2015
<i>2000=100</i>						
Residential property price index						
Vienna	143.9	156.1	180.7	196.3	204.6	209.2
Austria	127.3	132.7	149.1	156.0	161.4	168.1
Austria excluding Vienna	121.1	124.0	137.4	141.1	145.4	152.9
<i>2000=100</i>						
Rent prices¹						
Vienna: apartments	117.7	121.0	126.3	129.5	134.9	140.4
Austria excluding Vienna: apartments	145.9	148.2	144.1	162.5	158.9	158.3
Austria excluding Vienna: single-family houses	101.7	97.1	94.6	95.5	97.4	94.2
Rents of apartments excl. utilities, according to CPI, 2010=100	100.0	103.3	107.8	111.2	115.6	120.7
OeNB fundamentals indicator for residential property prices²						
Vienna	-1.3	4.7	13.6	17.9	18.9	19.1
Austria	-8.0	-4.7	0.7	-0.3	-0.5	1.4

Source: OeNB, Vienna University of Technology (TU Wien).

¹ Free and regulated rents.

² Deviation from fundamental price in %.

Austrian financial intermediaries¹

Table A10

Total assets and off-balance sheet operations

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>End of period, EUR million</i>								
Total assets on an unconsolidated basis	978,559	1,014,278	982,114	927,155	896,424	859,165	892,060	850,610
of which: total domestic assets	659,561	693,394	678,500	645,275	611,540	606,427	613,092	597,608
Total assets on a consolidated basis	1,130,853	1,166,313	1,163,595	1,089,713	1,078,155	1,056,705	1,079,466	1,061,760
Total assets of CESEE subsidiaries ^{1,3}	263,800	270,045	276,352	264,998	285,675	295,555	176,831	179,614
Leverage ratio (consolidated, %) ²	5.8	5.8	6.1	6.5	6.1	6.3	6.3	6.5

Source: OeNB.

¹ Including Yapı ve Kredi Bankası (not fully consolidated by parent bank UniCredit Bank Austria) since 2014.

² Definition up to 2013: tier 1 capital after deduction in % of total assets. Definition as of 2014 according to Basel III.

³ The transfer in ownership of UniCredit Bank Austria's CESEE subsidiaries to the Italian UniCredit Group limits the comparability of June 2016 figures. Therefore, the half-year figures 2015 and 2016 have been adjusted for this one-off effect.

Table A11

Sectoral distribution of domestic loans

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>End of period, EUR million</i>								
All currencies combined								
Banks	169,596	184,789	169,364	147,537	123,732	125,688	125,644	116,450
Nonbanks	321,524	329,912	330,385	326,820	328,324	333,970	332,494	335,793
of which: nonfinancial corporations	135,427	138,840	140,384	140,329	136,606	137,235	136,430	137,156
households ¹	135,215	138,353	139,056	139,052	140,946	146,432	144,849	147,971
general government	26,374	28,976	27,972	25,970	28,102	28,076	28,153	28,517
other financial intermediaries	24,324	23,586	22,806	21,244	22,578	22,127	22,955	22,033
Foreign currency								
Banks	25,851	25,288	19,422	16,013	14,939	12,724	14,662	12,138
Nonbanks	58,746	57,231	47,652	40,108	36,288	33,950	37,615	32,204
of which: nonfinancial corporations	12,550	12,111	9,156	6,985	6,379	5,293	6,281	4,662
households ¹	40,040	38,716	32,905	28,385	25,374	24,423	26,729	22,785
general government	2,627	3,267	2,827	2,478	2,777	2,858	3,080	2,766
other financial intermediaries	3,525	3,133	2,761	2,257	1,759	1,374	1,524	1,991

Source: OeNB.

¹ Including nonprofit institutions serving households.

Note: Figures are based on monetary statistics.

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

Table A12

Loan quality

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
	<i>End of period, % of claims on nonbanks</i>							
Specific loan loss provisions for loans to nonbanks (unconsolidated)	3.2	3.2	3.4	3.5	3.3	3.0	3.3	2.7
Specific loan loss provisions for loans to nonbanks (consolidated)	4.1	4.3	4.6	4.8	4.5	4.2	4.4	3.5
Specific loan loss provisions for loans to nonbanks (Austrian banks' subsidiaries in CESEE)	6.5	7.3	7.6	8.0	7.3	7.0	7.0	6.7
Nonperforming loan ratio (unconsolidated) ¹	4.7	4.5	4.7	4.1	4.4	4.3	4.6	4.0
Nonperforming loan ratio (consolidated) ¹	8.0	8.3	8.7	8.6	7.0	6.4	7.0	5.6
Nonperforming loan ratio (Austrian banks' subsidiaries in CESEE) ²	12.7	14.2	13.9	14.0	11.8	11.5	12.0	9.9

Source: OeNB.

¹ Ratio for loans to corporates and households (introduced in Financial Stability Report 24 to better indicate the loan quality in retail business; not comparable with former ratios).² The transfer in ownership of UniCredit Bank Austria's CESEE subsidiaries to the Italian UniCredit Group limits the comparability of June 2016 figures. Therefore, the half-year figures 2015 and 2016 have been adjusted for this one-off effect.

Table A13

Exposure to CESEE

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
	<i>End of period, EUR million</i>							
Total exposure according to BIS	209,352	216,086	209,818	201,768	184,768	186,397	188,601	187,553
Total indirect lending to nonbanks ^{1,3}	168,710	171,311	171,117	161,439	177,389	176,694	109,279	106,405
Total direct lending ²	49,460	52,010	51,539	52,926	43,144	40,986	43,018	39,677
Foreign currency loans of Austrian banks' subsidiaries in CESEE ³	84,601	88,282	85,382	79,047	76,736	69,317	36,915	32,733

Source: OeNB.

¹ Lending (net lending after risk provisions) to nonbanks by all fully consolidated subsidiaries in CESEE.² Cross-border lending to nonbanks and nonfinancial institutions in CESEE according to monetary statistics.³ The transfer in ownership of UniCredit Bank Austria's CESEE subsidiaries to the Italian UniCredit Group limits the comparability of June 2016 figures. Therefore, the half-year figures 2015 and 2016 have been adjusted for this one-off effect.

Table A14

Profitability on an unconsolidated basis

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>End of period, EUR million</i>								
Operating income	19,705	19,227	19,115	18,967	19,943	20,813	10,630	9,868
of which: net interest income	9,123	9,622	8,813	8,814	9,306	8,975	4,622	4,333
securities and investment earnings	4,026	3,662	3,670	3,018	3,550	3,443	2,133	2,019
fee and commission income	3,950	3,835	3,848	4,073	4,260	4,410	2,263	2,121
trading income	664	325	631	495	368	516	193	97
other operating income	1,942	1,784	2,153	2,567	2,458	3,469	1,418	1,298
Operating expenses	11,547	11,714	12,193	12,835	13,906	13,770	6,257	7,048
of which: staff costs	5,802	5,998	6,243	6,507	7,384	6,918	3,037	3,660
other administrative expenses	3,940	4,028	4,124	4,301	4,459	4,582	2,226	2,358
other operating expenses	1,805	1,688	1,827	2,027	2,063	2,270	994	1,030
Operating profit/loss	8,159	7,513	6,922	6,132	6,037	7,043	4,373	2,820
Net profit after taxes	4,207	1,211	3,214	-935	-6,692	3,720	3,574	3,217
%								
Return on average assets ¹	0.4	0.1	0.3	-0.1	-0.7	0.4	0.4	0.4
Return on average equity (tier 1 capital) ¹	5.8	1.6	4.31	-1.2	-9.9	5.9	5.8	4.9
Interest income to gross income	46.3	50.0	46.1	46.5	46.7	43.1	43.5	43.9
Cost-to-income ratio	58.6	60.9	63.79	67.7	69.7	66.2	58.9	71.4

Source: OeNB.

¹ End-of-period result after tax in % of average total assets and average tier 1 capital, respectively.

Table A15

Profitability of Austrian subsidiaries^{1,4} in CESEE

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>End of period, EUR million</i>								
Operating income	13,436	13,622	13,268	13,307	12,160	12,261	4,011	3,970
of which: net interest income	9,333	9,402	8,781	8,414	9,069	8,431	2,791	2,572
securities and investment earnings	47	70	61	63	27	49	29	41
fee and commission income	2,954	3,092	2,992	3,164	3,477	3,358	1,135	1,068
trading income	368	426	790	749	-139	733	199	558
other operating income ²	1,227	1,058	1,230	1,672	-273	-309	-143	-270
Operating expenses	6,678	6,814	6,950	7,009	6,413	6,264	2,062	2,014
of which: staff costs	2,870	2,997	2,992	2,922	2,979	2,896	965	958
Operating profit/loss	6,757	6,809	6,317	6,298	5,747	5,998	1,949	1,956
Net profit after taxes	2,063	1,757	2,093	2,216	747	2,048	947	1,409
%								
Return on average assets ³	0.8	0.7	0.8	0.8	0.3	0.7	1.6	1.1
Return on average equity (tier 1 capital) ³	9.2	7.2	8.2	8.4	9.9	9.5	12.0	16.5
Interest income to gross income	69	69	66	63	75	69	70	65
Cost-to-income ratio ²	50	50	52	53	53	51	51	50

Source: OeNB.

¹ From the first quarter of 2014 until end-2015, pro rata data of Yapi ve Kredi Bankasi, a joint venture of UniCredit Bank Austria in Turkey, have been included.² As from end-2014, other operating income and other operating expenses are netted under other operating income.³ End-of-period result expected for the full year after tax as a percentage of average total assets and average total tier 1 capital, respectively.⁴ The transfer in ownership of UniCredit Bank Austria's CESEE subsidiaries to the Italian UniCredit Group limits the comparability of June 2016 figures. Therefore, the half-year figures 2015 and 2016 have been adjusted for this one-off effect.

Table A16

Profitability on a consolidated basis⁴

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>End of period, EUR million</i>								
Operating income	37,508	37,207	37,673	35,271	28,717	28,064	11,200	10,330
of which: net interest income	20,390	20,426	19,259	18,598	19,345	18,336	7,237	6,777
net fee-based income	7,678	7,592	7,260	7,590	7,741	7,730	3,001	2,924
net profit/loss on financial operations	997	845	1,137	670	426	-50	-168	138
other operating income ¹	8,443	8,344	10,016	8,413	1,205	2,048	1,206	1,067
Operating expenses	24,030	26,839	25,582	27,318	19,833	17,612	6,768	7,026
of which: staff costs	9,941	10,279	10,391	10,378	9,543	8,959	3,741	3,790
other administrative expenses ²	6,262	6,316	6,410	6,628	6,569	6,830	2,404	2,432
Operating profit/loss	13,478	10,369	12,090	7,953	8,884	10,452	4,432	3,304
Net profit after taxes	4,577	711	2,966	-1,035	685	5,244	2,148	2,266
%								
Return on average assets ³	0.5	0.1	0.3	-0.0	0.0	0.6	0.5	0.5
Return on average equity (tier 1 capital) ³	8.2	1.7	5.1	-0.7	0.7	9.7	8.1	8.1
Interest income to gross income ³	54.4	54.9	51.1	52.7	67.4	65.3	64.6	65.6
Cost-to-income ratio	57.9	66.4	61.7	73.0	69.1	62.8	60.4	72.0

Source: OeNB.

¹ As from end-2014, other operating income and other operating expenses are netted under other operating income.² As from end-2014, some positions of other operating expenses are netted under other operating income.³ 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.⁴ The transfer in ownership of UniCredit Bank Austria's CESEE subsidiaries to the Italian UniCredit Group limits the comparability of June 2016 figures. Therefore, the half-year figures 2015 and 2016 have been adjusted for this one-off effect.

Table A17

Solvency

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>End of period, EUR million</i>								
Own funds	86,228	88,071	88,204	88,994	87,584	87,793	89,541	88,942
Total risk exposure	653,313	649,613	621,925	578,425	562,790	537,447	561,947	539,321
<i>End of period, eligible capital and tier 1 capital, respectively, as a percentage of risk-weighted assets</i>								
Consolidated total capital adequacy ratio	13.2	13.6	14.2	15.4	15.6	16.3	15.9	16.5
Consolidated tier 1 capital ratio	10.0	10.3	11.0	11.9	11.8	12.9	12.2	13.3
Consolidated core tier 1 capital ratio (common equity tier 1 as from 2014)	9.4	9.8	10.7	11.6	11.7	12.8	12.1	13.2

Source: OeNB.

Note: As from 2014, figures are calculated according to CRD IV requirements. Therefore, comparability with previous figures is limited.

Table A18

Liquidity risk

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
	<i>End of period, %</i>							
Short-term loans to short-term liabilities	64	66	66	59	62	60	63	60
Short-term loans and other liquid assets to short-term liabilities	119	118	121	109	117	113	119	112

Source: OeNB.

Table A19

Market indicators of selected Austrian financial instruments

	2009	2010	2011	2012	2013	2014	2015	Oct. 16
	<i>% of end-2011 prices, end of period</i>							
Share prices								
Erste Group Bank	72	100	39	67	71	54	81	80
Raiffeisen Bank International	92	100	49	73	59	30	33	36
EURO STOXX – Banks	134	100	63	69	86	82	78	63
Uniq	89	100	64	68	67	56	54	42
Vienna Insurance Group	91	100	81	102	92	94	64	46
EURO STOXX – Insurance	106	100	83	108	143	149	172	145
	<i>%, end of period</i>							
Relative valuation: share price-to-book value ratio								
Erste Group Bank	0.80	1.30	0.48	0.88	1.06	0.72	1.08	1.07
Raiffeisen Bank International	1.12	1.15	0.53	0.83	0.92	0.46	0.50	0.55
EURO STOXX – Banks	0.94	0.64	0.36	0.60	0.96	0.72	0.72	0.60
Uniq	1.41	2.25	1.18	1.13	1.07	0.87	0.84	0.66
Vienna Insurance Group	1.03	1.21	0.90	1.21	1.07	1.12	0.76	0.54
EURO STOXX – Insurance	1.03	0.94	0.69	0.81	0.93	0.15	1.02	0.83

Source: Thomson Reuters, Bloomberg.

Table A20

Key indicators of Austrian insurance companies

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>End of period, EUR million</i>								
Business and profitability								
Premiums	16,652	16,537	16,341	16,608	17,077	17,342	9,571	9,220
Expenses for claims and insurance benefits	11,882	12,826	12,973	13,150	14,157	15,514	7,788	7,767
Underwriting results	373	295	455	592	477	475	333	422
Profit from investments	3,203	2,964	3,391	3,354	3,211	3,216	1,715	1,725
Profit from ordinary activities	1,101	1,162	1,395	1,524	1,421	1,354	898	954
Acquisition and administrative expenses	3,382	3,541	3,499	3,528	3,573	3,697	1,879	1,934
Total assets	105,099	105,945	108,374	110,391	113,662	114,495	115,217	115,024
Investments								
Total investments	98,300	99,776	103,272	105,496	107,442	107,933	108,173	108,398
of which: debt securities	38,223	37,813	37,614	39,560	41,667	41,517	41,553	42,803
stocks and other equity securities ¹	12,559	12,363	12,505	12,464	12,619	12,522	12,539	12,415
real estate	5,703	5,236	5,371	5,689	5,858	5,912	5,898	5,866
Investments for unit-linked and index-linked life insurance	15,325	15,870	18,330	19,127	20,179	19,776	20,014	19,413
Claims on domestic banks	16,458	16,405	16,872	16,687	15,800	15,492	14,525	15,059
Reinsurance receivables	1,229	1,733	1,933	824	918	971	1,083	1,116
%								
Risk capacity (solvency ratio)	356	332	350	368	380	375	381	x

Source: FMA, OeNB.

¹ Contains shares, share certificates (listed and not listed) and all equity instruments held by mutual funds.

Table A21

Assets held by Austrian mutual funds

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>End of period, EUR million</i>								
Domestic securities	51,001	50,046	50,963	49,757	52,116	52,970	53,547	52,817
of which: debt securities	15,884	16,683	17,527	16,203	15,467	13,609	14,021	13,653
stocks and other equity securities	3,696	2,991	3,637	3,610	3,345	3,530	3,559	3,266
Foreign securities	96,684	87,458	96,854	99,647	110,397	114,833	116,788	115,537
of which: debt securities	61,744	58,695	63,661	62,972	69,642	70,326	71,462	71,519
stocks and other equity securities	15,540	12,097	14,208	16,278	17,910	18,521	19,116	17,206
Net asset value	147,684	137,504	147,817	149,404	162,513	167,802	170,335	168,354
of which: retail funds	88,313	78,299	84,158	83,238	89,163	91,626	94,083	91,884
institutional funds	59,372	59,205	63,659	66,167	73,350	76,177	76,252	76,470
Consolidated net asset value	123,794	116,747	126,831	128,444	138,642	143,249	144,919	143,294

Source: OeNB.

Table A22

Structure and profitability of Austrian fund management companies

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>End of period, EUR million</i>								
Total assets	699	661	644	670	725	745	683	679
Operating profit	142	125	111	131	158	184	98	73
Net commissions and fees earned	302	284	283	310	368	411	207	197
Administrative expenses ¹	199	195	205	219	246	266	128	135
Number of fund management companies	29	29	29	29	29	29	29	29
Number of reported funds	2,203	2,171	2,168	2,161	2,118	2,077	2,089	2,051

Source: OeNB.

¹ Administrative expenses are calculated as the sum of staff and material expenses.

Table A23

Assets held by Austrian pension funds

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>End of period, EUR million</i>								
Total assets	14,976	14,798	16,335	17,385	19,011	19,646	19,903	19,848
of which: direct investment	968	1,139	1,139	1,640	1,065	990	1,061	929
mutual funds	13,944	13,626	15,278	15,745	17,946	18,656	18,842	18,919
foreign currency (without derivatives)	x	x	5,714	5,964	7,578	7,279	7,620	8,333
stocks	x	x	4,805	5,472	6,250	6,200	7,106	5,890
debt	x	x	8,464	7,650	9,163	9,552	9,297	10,202
real estate	x	x	567	583	576	690	618	702
cash and deposits	1,181	1,624	1,488	2,033	1,598	1,850	1,636	1,508

Source: OeNB, FMA.

Table A24

Assets held by Austrian severance funds

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>End of period, EUR million</i>								
Total direct investment	1,004	1,393	1,442	1,528	1,415	1,565	1,467	1,612
of which: euro-denominated	985	1,363	1,415	1,507	1,299	1,502	1,438	1,550
foreign currency-denominated	19	30	27	21	x	63	29	62
accrued income claims from direct investment	16	19	22	21	15	14	13	14
Total indirect investment	2,569	2,891	3,834	4,701	5,912	6,741	6,394	7,181
of which: total of euro-denominated investment in mutual fund shares	2,379	2,741	3,540	4,220	5,190	5,790	5,523	6,289
total of foreign currency-denominated investment in mutual fund shares	190	151	294	481	722	951	871	892
Total assets assigned to investment groups	3,573	4,284	5,254	6,218	7,306	8,294	7,837	8,770

Source: OeNB.

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

Table A25

Transactions and system disturbances in payment and securities settlement systems

	2010	2011	2012	2013	2014	2015	H1 15	H1 16
<i>Number of transactions in million, value of transactions in EUR billion</i>								
HOAM.AT								
Number	1	1	1	1	1	1	1	1
Value	9,447	7,667	9,974	5,906	7,438	6,381	3,551	2,262
System disturbances	4	1	1	3	0	1	0	2
Securities settlement systems								
Number	2	2	2	2	2	2	1	1
Value	398	439	418	369	377	315	159	165
System disturbances	0	0	1	5	2	3	2	1
Card payment systems¹								
Number	583	591	633	673	856 ¹	901	435 ²	379 ³
Value	45	45	48	72	91 ¹	97	47 ²	25 ³
System disturbances	25	4	4	2	0	2	2	2
Participation in international payment systems								
Number	31	36	41	53	113	144	71	80
Value	1,164	1,306	1,820	1,643	2,463	2,420	1,235	1,410
System disturbances	0	0	0	0	0	0	0	0

Source: OeNB.

¹ In mid-2014, significant changes were implemented in the reporting of card payment data. On-us ATM transactions have been included since then.² On-us ATM transactions are reported annually and are proportionally adjusted for half-year figures.³ On-us ATM transactions are reported annually and are therefore not included in half-year figures of the current year.

Notes

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German | irregularly
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